



COPADATA
do it your way

zenon manual

Screens

v.7.11





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1. Welcome to COPA-DATA help

GENERAL HELP

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

PROJECT SUPPORT

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

LICENSES AND MODULES

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

2. Screens

Screens are central elements of a project. They display the configured equipment, inform, and provide user elements.

Screens consist of vector elements and/or dynamic elements. These are linked with variables or functions. Screens are configured in the main window of the Editor.

zenon provides a great number of pre-defined screen types, such as alarm information lists, trend screens etc. The advantage of this type of screen is that the desired functionality is connected to the

screen type. You must create the screen type and you have a variety of pre-defined functions available. You can find an overview of screen types in the Types of screen (on page 326) section.



License information

Part of the standard license of the Editor and Runtime.

MAIN WINDOW

In the main window documents such as screens, reports, etc. are displayed and edited. The main window is the only window that cannot be hidden.

OPEN MULTIPLE DOCUMENTS PARALLEL.

You can display multiple screens in the main window at the same time. This function can be activated via: *Options -> main window with tabs*. The screens can be selected with tabs at the top of the main window and can be positioned via options in menu item **Windows**.

To close open screens, use the keyboard shortcut **Ctrl+F4**, the context menu or the command *Screen->Close*.

CONTEXT MENU DOCUMENTS

Right-click on the tab of a document in order to open the context menu.

Parameters	Description
Save	Saves the document.
Close	Closes the document.
Close all others	Closes all other documents.

POSITION ELEMENTS IN THE SCREEN

Activate elements by clicking on the symbol in the Toolbar elements and open them with the mouse in the main window.

There are multiple possibilities for moving the elements:

- Move quickly: Click element and position it with the mouse

- ▶ Position exactly: Click element and position it with the arrow keys
- ▶ Turning: Turn element with the "handle" above the upper left corner as you like it.

POSITIONING OF ELEMENTS IN THE EDITOR AND IN RUNTIME

Elements can be positioned at different levels in the Editor and in Runtime. Individual elements can also be hidden (on page 325) in the Editor

Attention: Control elements are always displayed at the uppermost position. That also applies if they are covered by other elements in the Editor. This ensures that they can always be reached.

ADJUSTMENT TO RESOLUTION

Screens and their elements are automatically adjusted to the screen resolution in Runtime. This can be prevented. to display screen elements in the size and position configured in the Editor, activate the `Do not adapt element to screen resolution` property for the corresponding screen in the `Size` group.

3. Graphics quality

In zenon the quality of the displayed graphics can be tuned to the resources for the system. This setting is made using the project setting `Graphics quality` in group `Graphical design`. Possible options are:

- ▶ `Windows Basic`: Basic graphics settings. Recommended for resource-weak hardware.
- ▶ `Windows Enhanced`: Provides enhanced functions for the graphical display - needs more resources.
- ▶ `DirectX Software`: Graphics calculations are done by the CPU. Depending on the graphic you can use more than one CPU. Using `DirectX Software` may cause a high CPU workload.
- ▶ `DirectX Hardware`: A part of the graphic calculation is done by the graphics card by which the performance is increased. If this setting is not supported by the used system, zenon automatically switches to `DirectX Software`. Generally speaking `DirectX Hardware` is preferable and `DirectX Software` should only be used if necessary.



Attention

- ▶ **Windows Enhanced** and **DirectX** are not available under Windows CE.
- ▶ DirectX display is only supported in the Runtime.
- ▶ DirectX cannot be used for OCX.

DIRECTX

DirectX allows a higher graphic quality than **Windows Basic** or **Windows Enhanced**. Thus in contrast to **Windows Basic/Enhanced**, **DirectX** can turn on/off properties **Use antialiasing** and **ClearType fonts** regardless of the settings in the operating system. The antialiasing quality of **DirectX** is higher than the quality of **Windows Enhanced**.

To use **DirectX**, several requirements must be fulfilled:

Requirement	Description
DirectX Hardware or DirectX Software must be activated.	In the project settings you must select DirectX Hardware or DirectX Software for property Graphical design .
The operating system must support DirectX 11 .	DirectX Hardware and DirectX Software only works on operating system supporting DirectX 11 . If the system does not support DirectX 11 , it automatically switches to Windows Enhanced .
The current DirectX Runtime must be installed.	For zenon it is installed together with the setup. For the Web Client it must be installed manually.
The screen or element must support DirectX .	Only elements or screens which support DirectX can be displayed with DirectX .
For DirectX Hardware the minimum requirements must be fulfilled.	For details see minimum requirements graphics card. If they are not fulfilled, it automatically switches to DirectX Software . If the operating system does not provide any hardware acceleration (e.g. Remote Desktop), it may not be possible to use DirectX Hardware .

MINIMUM REQUIREMENTS GRAPHICS CARD FOR DIRECTX HARDWARE

For the use of **DirectX Hardware** the following minimum requirements must be fulfilled:

Parameters	Minimum requirements	Recommended
Graphics card:	Dedicated DirectX 11 AMD or nVidia graphics card	Dedicated DirectX 11 AMD or nVidia graphics card
Graphics memory: (Actually needed size depends on the number of the called up screens and displayed elements.)	512 MB VRAM	1 GB VRAM
Driver graphics card:	Most current driver of the graphics card manufacturer	

You can check the DirectX hardware compatibility of the graphics card and the driver with the Windows operating system tool `dxdiag.exe`.

Up to Windows 7: Check the `DDI version` value under `Display`. The value 11 for example means DirectX 11.

From Windows 8: All supported versions of DirectX are displayed in the `Display` tab under `Feature Levels`. For example, DirectX 11 is displayed as 11.0.

DIFFERENCES BETWEEN DIRECTX AND WINDOWS ENHANCED

DirectX differs from Windows Enhanced regarding quality, performance and resource requirements. Some of the most important differences:

- Scaling, distortions and rotations of objects are displayed with antialiasing. Antialiasing also works with transformations.
- Shadows are displayed as a correct likeness of the actual element. Even texts and semi-transparent bitmaps have a completely correct shadow. Dynamic changes are considered: If a button is clicked, the shadow also changes.
- Glow effect enables the glowing of an element via the likeness of the actual element. Even texts and semi-transparent bitmaps have a correct glow effect. Dynamic changes are considered: If a button is clicked, the glow effect also changes.



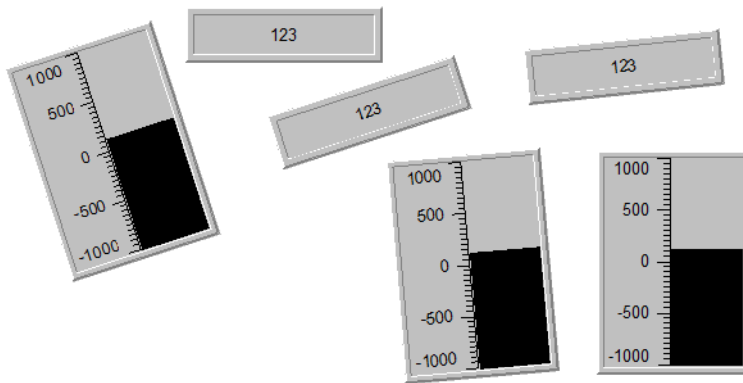
Information

The use of WMF and EMF graphics with DirectX may cause performance losses.

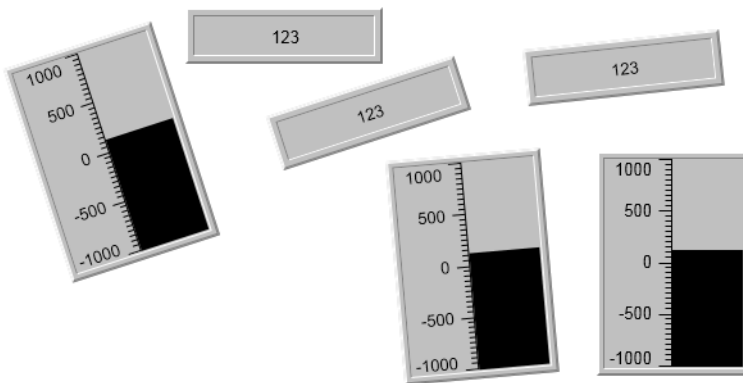
EXAMPLES

ROTATED DYNAMIC ELEMENTS

With Windows Enhanced:



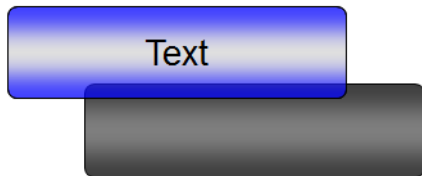
With DirectX:



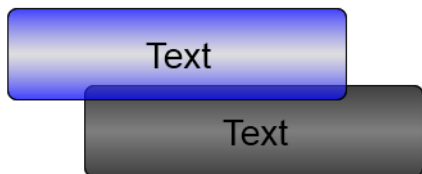
The forming of ridges at the edges is reduced, texts are positioned correctly.

SEMI-TRANSPARENT BUTTON WITH SHADOW

With Windows Enhanced:



With DirectX:

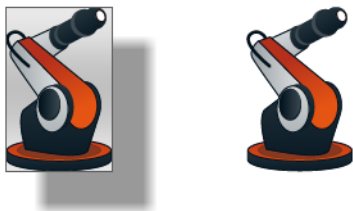


Correct shadow with visible text.

SHADOW OF A BUTTON WITH BITMAP

On the left a bitmap button with shadow is displayed, on the right the same screen with property `Transparent` active.

With Windows Enhanced:



With DirectX:



3.1 Error treatment DirectX

Errors are displayed in the Diagnosis Viewer.

DIRECTX IS NOT INITIALIZED.

If DirectX cannot be initialized during the call up of a screen or in continuous operation,

- ▶ a progress bar is displayed
- ▶ it is tried to initialize DirectX again
- ▶ the Runtime continuous normally as long as the progress bar is displayed
- ▶ you can try to solve the problem (driver installation, ...)

The progress bar can be canceled by the user by clicking on button **cancel**. After the cancellation the Runtime is closed and an error message is displayed which can only be closed by clicking **ok**.

Note: For errors which make it impossible to reinitialize DirectX, an error message is displayed immediately.

DIAGNOSIS VIEWER

DirectX provides individual messages in the Diagnosis Viewer with:

- ▶ an error message
- ▶ possible reasons for the errors
- ▶ Error codes

The display take place in an own module **DirectX**. For errors the error text is displayed in text field **Error**. For warnings and debug information the corresponding messages are displayed in text field **General**:

- ▶ For the successful call up of a screen at least one **DEBUG** success message is displayed.
- ▶ Warning point out events which can influence the operation.
- ▶ If an error occurs which cannot be fixed, an error message is displayed.



Information

If a message is not completely displayed in the table in the Diagnosis Viewer, open the entry via double click to display the whole message.

CHECK LIST FOR ERROR CHECKING

- ▶ An appropriate check whether DirectX works can be carried out by activating the debug message in the Diagnosis Viewer. For successful support, an appropriate message is displayed.
- ▶ Are DirectX-specific warnings or error messages displayed in the Diagnosis Viewer?
- ▶ Is property `DirectX Hardware` or `DirectX Software` activated in project setting `Graphics quality`?
- ▶ Are the minimum requirements for DirectX fulfilled? For details about minimum requirements see chapter Graphics quality (on page 11).
 - Is DirectX 11 supported by the operation system?
 - Is the current DirectX Runtime installed?
 - Is DirectX Hardware supported by the graphics card?

You can check the DirectX hardware compatibility of the graphics card and the driver with the Windows operating system tool `dxdiag.exe`.

Up to Windows 7: Check the `DDI version` value under `display`. The value 11 for example means DirectX 11.

From Windows 8: All supported versions of DirectX are displayed in the `display` tab under `Feature Levels`. For example, DirectX 11 is displayed as 11.0.

- ▶ Is DirectX supported by the screen or the element?
- ▶ Does the display work properly with `Windows Basis` or `Windows Enhanced`?
- ▶ Does the display work with another driver?
- ▶ Does the display work with a graphics card of another manufacturer?

4. Context menu project manager

Menu item	Action
New screen	Creates a new screen with the standard name 'Picture' as a standard screen type.
Export XML all...	Exports all entries as an XML file.
Import XML...	Imports entries from an XML file. Note: Existing frames are not replaced during XML import using the Screens node. Existing frames are overwritten via the Frames node during XML import. In this case, all screens and their elements are adapted to the new frame.
Editor profile	Opens the drop-down list with predefined editor profiles.
Help	Opens online help.

5. Detail view of toolbar and context menu



CONTEXT MENU

Menu item	Action
New screen	Adds a new screen to the list and puts the focus onto this entry.
Open screen	Opens the main window for the screen highlighted.
Create standard function	Opens the assistants to select a picture and for the configuration of details, in order to create a suitable function automatically. The action is documented in the output window.
Jump back to starting element	Click to go to back the element from which you jumped to the screen.
Copy	Copies the selected entries to the clipboard.
Paste	Pastes the contents of the clipboard. If an entry with the same name already exists, the content is pasted as "Copy of ...".
Delete	Deletes selected entries after a confirmation from list.
Expand/collapse	Allows all or selected nodes to be expanded or collapsed. Select from drop-down list: <ul style="list-style-type: none"> ▶ Expand all ▶ Reduce all ▶ Expand selected ▶ Reduce selected
Export selected XML	Exports all selected entries as an XML file.
Import XML	Imports entries from an XML file. Note: Existing frames are not replaced during XML import using the Screens node. Existing frames are overwritten via the Frames node during XML import. In this case, all screens and their elements are adapted to the new frame.
Create template for screen type	Opens dialog for creating a new template (on page 334) for adding control elements in the screen type.
Remove all filters	Removes all filter settings.
Edit selected cell	Opens the selected cell for editing. The binocular symbol in the header shows which cell has been selected in a highlighted line. Only cells that can be edited can be selected.

Replace text in selected column	Opens the dialog for searching and replacing texts.
Properties	Opens the Properties window for the selected entry.
Help	Opens online help.

Note: Subscreens of Faceplates (on page 416) linked in screen containers can be displayed and copied, but not edited.

6. Edit Screens Toolbar

A toolbar is available for editing screens. Per default, it is displayed below the menu bar.



Symbol (from left to right)	Function
Save screen	Save the current screen.
Save all	Saves all changed screens.
Cut	Cuts the selected element and stores it in the clipboard; works across projects, too. Only available if an element has been selected.
Copy	Saves a copy of the current screen to the clipboard. Only available if an element has been selected.
Insert	Inserts (i.e. pastes) a screen from the clipboard. Only available if the clipboard contains data.
Redraw screen	Refreshes the display.
Edit mode	Switches from Zoom to Edit mode .
Undo	Allows undoing up to 100 actions. By default, 10 actions can be undone. Define the number of actions: <i>Options -> Settings -> Settings -> number of undoable actions</i> . Enter a number between 1 and 100.
Zoom	Provides two zoom modes: <ul style="list-style-type: none"> ▶ Variable zoom: A predefined value can be selected from the combobox, or you can directly enter any value between 15% and 400%. ▶ Zoom tool: You can zoom directly in the screen with the two magnifier symbols (+ and -). The CTRL key switches between the different modes. The defined zoom is saved for each single screen. Close zoom mode: Click on the Edit mode symbol in the Elements toolbar.
Print	The whole screen content is printed on the default printer. Set printer properties via <i>File -> Standard configuration -> standard</i> .
Help	Opens the online help
Symbol bar options	Clicking on the arrow opens the submenu: Active: Tool bar is displayed If the toolbar is not displayed, it can be activated using the Menu Options ->

	<p>Toolbar.</p> <p>Note: For free placed tool bar (undocked from the Editor) options are not displayed. The tool bar can be closed by clicking on button X.</p>
--	---

7. Toolbar Elements



No.	Symbol	Function
01	Rectangle	With frame and fill color, type of frame and fill pattern
02	Line	With definable line thickness, color and type
03	Rounded rectangle	Rectangle with freely definable rounded corners
04	Ellipse/Circle	With frame and fill color, type of frame and fill pattern (circle)
05	Polygon	With frame and fill color, type of frame and fill pattern
06	Polyline	With line type and color (also filling pattern and color for an area description)
07	Arc of a circle	With definable line thickness, color and type
08	Segment of a circle	draw circle segment with an opening angle of 180° (changeable), definable line thickness, color and type
10	Static text	With font color and selection of the type of font
09	Tube	With frame and fill color, type of frame and fill pattern
11	Bar Graph	Display values as bar graph
12	Numerical value	Display values numerically
13	Dynamic Text	Display limit value texts
14	Trend Element	Simple line graphics
15	Indicating instrument	Value in instrument display
16	Status Element	Take colors from status configuration
17	Button	Operating field in button display
18	Switch	Simple command initiation or set value input element
19	Multi-binary element	Display several variables in one screen point in color and symbol (string)
20	Screen Alarm Button	Only available with a license for SICAM 230
21	Message element	Display texts from a text table
22	Clock	Date and time

23	Command Element	Only available with a license for SICAM 230
24	Combined element	Display one or more variables in color or symbol (chained characters)
25	Screen alarming	Only available with a license for SICAM 230
26	ActiveX element	Insert ActiveX control
27	Universal slider	Slider control
28	Combo/List boxes	Link values of variables with text messages
29	WPF Element	Displays valid WPF XAML files.
30	Edit mode	Switches from zoom mode to edit mode
	Symbol bar options	<p>Clicking on the arrow opens the submenu:</p> <p>Active: Tool bar is displayed</p> <p>If the toolbar is not displayed, it can be activated using the Menu Options -> Toolbar.</p> <p>Note: For free placed tool bar (undocked from the Editor) options are not displayed. The tool bar can be closed by clicking on button X.</p>

8. Context menu Elements

Commands adapted to the situation are available to you in the context menu. You can also get to these commands using menus and toolbars.

Command	Description
Symbol	<p>Opens drop-down list with commands. The following are available depending on symbol status:</p> <ul style="list-style-type: none"> ▶ Create embedded symbol ▶ Break up ▶ Changing to individual editing mode/leaving individual editing mode ▶ Insert in existing embedded symbol ▶ Convert linked symbol to embedded symbol ▶ Editing in the symbol editor ▶ Inserting in the symbol library
▶ Create embedded symbol	Creates an embedded symbol.
▶ Break up	Breaks up an embedded symbol into its screen elements.
▶ Changing to individual editing mode/leaving individual editing mode	Switches to the individual editing mode or back to the symbol editing mode. The individual editing mode enables you to edit individual elements of a symbol.
▶ Insert in existing embedded symbol...	Inserts symbol into an existing embedded symbol.
▶ Convert linked symbol to embedded symbol	Converts a linked symbol to an embedded symbol.
▶ Edit in symbol editor	Opens a linked symbol in the symbol editor to edit it there.
▶ Inserting in the symbol library	Opens dialog (on page 314) to add symbols from a screen of a symbol library.

Element position	<p>Opens drop-down list for changing the position of the element:</p> <ul style="list-style-type: none"> ▶ Foreground: Moves selected elements into foreground ▶ Background: Moves selected elements into background ▶ Forward: Moves selected elements one layer up ▶ Backward: Moves selected elements one layer down.
Arrange	Opens drop-down list for rearranging elements.
Linked elements	Opens drop-down list with dynamically linked elements, such as: Variables, functions, fonts, symbols etc.
Replacing links	Find/replace function e.g. tank 1 temperature is replaced by tank 2 temperature
Cut	Cuts the selected objects and stores them in the clipboard.
Copy	Copies selected objects
Paste	Pastes copied or cut objects from the clipboard.
Paste in same position	Pastes copied or cut objects from the clipboard.
Delete	Deletes selected objects
Transfer format (on page 224)	<p>Transfers the properties of a selected element to another one / multiple elements.</p> <ul style="list-style-type: none"> ▶ Transfer to an element: <i>Click on element with original properties</i> -> Click on Transfer properties symbol or command in the context menu -> Click on target element: Properties are transferred ▶ Transfer to multiple elements: <i>Select source element</i> -> Select target element with the Ctrl key held down (source and target element are highlighted) > Click on the Transfer properties symbol or command in the context menu -> Properties of the source element are transferred to the target elements. <p>Source and target object determine which properties are transferred.</p>

	If several elements were chosen as source, the properties of the first selected element are transferred.
Full screen mode	<p>The full-screen hides all remaining windows and shows only the main window with all opened documents (screens, reports, ...) in full-screen mode.</p> <p>The full-screen mode can be closed by:</p> <ul style="list-style-type: none"> ▶ the displayed button for closing the full-screen mode ▶ the short key <code>Shift+F9</code> ▶ the key <code>Esc</code>
Redraw screen/symbol	Refreshes the display.
Display grid	Switches the grid on or off.
Use grid	<p>Switches the orientation of elements to the grid on or off.</p> <p>On: All objects are automatically aligned with the grid.</p> <p>Note: The <code>Ctrl</code> button deactivates this setting temporarily. If the <code>Ctrl</code> button is held when moving an element, the element is not aligned to the grid.</p>
Use magnetic points	<p>Switches magnetic points on or off.</p> <p>Use: If you move an object near the handling point of another object, it snaps in place at the handling point.</p>
Zooming	Changes the resolution in fixed steps between 15% and 400%.
Screenshot print current screen/symbol	The current screen is printed on the standard printer. Set printer properties via <i>File -> Standard configuration -> standard</i> .
Insert vector graphics	<p>Opens the dialog for inserting an external vector graphic.</p> <p>Note: Import of vector graphics is not available for the 64-bit Editor.</p>
Properties	Opens the property window for the selected element.
Help	Opens online help.

9. XML export and XML import

EXPORTING SCREENS

The included variables and functions are exported with the screens. The export file for the screens (on page 9) has the following sections:

- ▶ Screens
- ▶ Frames
- ▶ Symbols
- ▶ Variables
- ▶ Functions

To export screens:

1. highlight the desired screens
2. select **Export selected XML...** in the context menu of the detail view
Alternate: select, in the context menu of the **Screen** node, the **XML export all...** command
3. the selection dialog for the saving location is opened
4. select the desired saving location
5. assign a name
6. pay attention to file type XML
7. confirm by clicking on the **Save** button

The selected screens are exported to an XML file and can be imported in this or in other projects at any time.

IMPORTING SCREENS

To import screens:

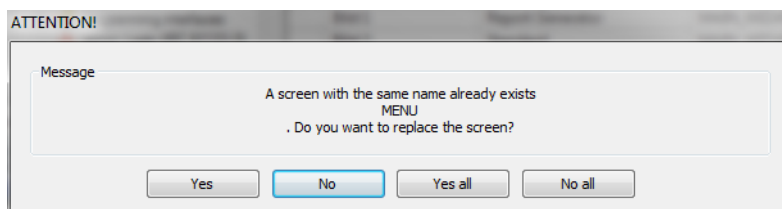
1. in the context menu of node **Screens** or in the detail view **Screens** select the **Import XML** command

2. the selection dialog for the saving location is opened
3. navigate to the saving location of the desired XML file
4. Select the desired file
5. confirm the import by clicking on the **Open** button

The screens are imported.

NAME CONFLICTS DURING THE IMPORT

At the import of a screen the name (attribute **shortName**) which is stored in the XML file is used for the name of the screen which is created. If a screen with the same name already exist, the import is halted and an error message is displayed:



Parameters	Description
Yes	The screen described in the error message is replaced by the screen from the XML file at the import. If a new conflict occurs, the error message is displayed again.
No	The screen described in the error message is not imported. The existing screen is maintained. If a new conflict occurs, the error message is displayed again.
Yes, all	The screen described in the error message is replaced by the screen from the XML file at the import. This setting is used automatically when errors due to using the same name occur. All affected screen are replaced.
No, all	The screen described in the error message is not imported. The existing screen is maintained. This setting is used automatically when errors due to using the same name occur. All affected screen are maintained.

Note: Only the **shortName** is used. The file name does not matter for the name of the screens which should be imported. Thus it cannot be used to solve the conflict.

VARIABLES AND FUNCTIONS IN SCREENS

Dynamic elements (on page 30) and Frames (on page 258) are automatically imported together with the screens. Variables and functions have to be imported manually before from the same file.

Only variables and functions of the first level are treated, i.e. variables and functions that are directly linked to the screen. As on the one hand variables can be linked to functions (e.g. setting values) but on the other hand functions can be linked to variables (e.g. limit functions), it can be necessary to first import the variables, then the functions, and then the variables again. Then all links should work correctly.

Example: A screen contains a button with a function **Send value to hardware** to a variable. The function is imported with the screen but not the variable.



Information

Here we recommend using the XML Import Wizards.

10. Screen elements

You use two types of screen elements in zenon:

1. static vector elements
2. Dynamic elements

You have many key combinations available when editing screen elements. You can find details in the help, in the graphics key combinations (on page 236) section.

In this section, you can find information on:

- ▶ Insert into the main window
- ▶ Define properties
- ▶ Change element size
- ▶ Rotate element
- ▶ Sequence in Runtime
- ▶ Vector elements in zenon
- ▶ Dynamic elements in zenon



Information

Screen elements (on page 30) that are linked to a variable that have neither a value nor a status are switched to invisible in Runtime.

INSERT INTO THE MAIN WINDOW

The selected element can be selected several time in the main window and arranged there. Which element is selected and therefore active is shown by a symbol under the peak of the mouse pointer. To draw the template:

1. press the left mouse button
2. move the mouse
3. release the mouse button

Exception: Polyline, Polygon and tube

- ▶ A mouse click inserts a new supporting position
- ▶ A double-click or the `ESC` key stops pulling

Elements can be freely rotated with the mouse; to do this:

1. click on the element with the mouse
2. rotate it with the yellow sizing handle

The touch point and therefore the rotation point can be set in `Reference point` properties.

DEFINE PROPERTIES

For elements in the main window, the properties are set in the Property window. The corresponding element must be activated in the main window to do this.

You can also select several elements at the same time and assign these common properties. For this, the following applies:

- ▶ Different values for different properties are marked in red.
- ▶ Properties which cannot be changed jointly are deactivated.

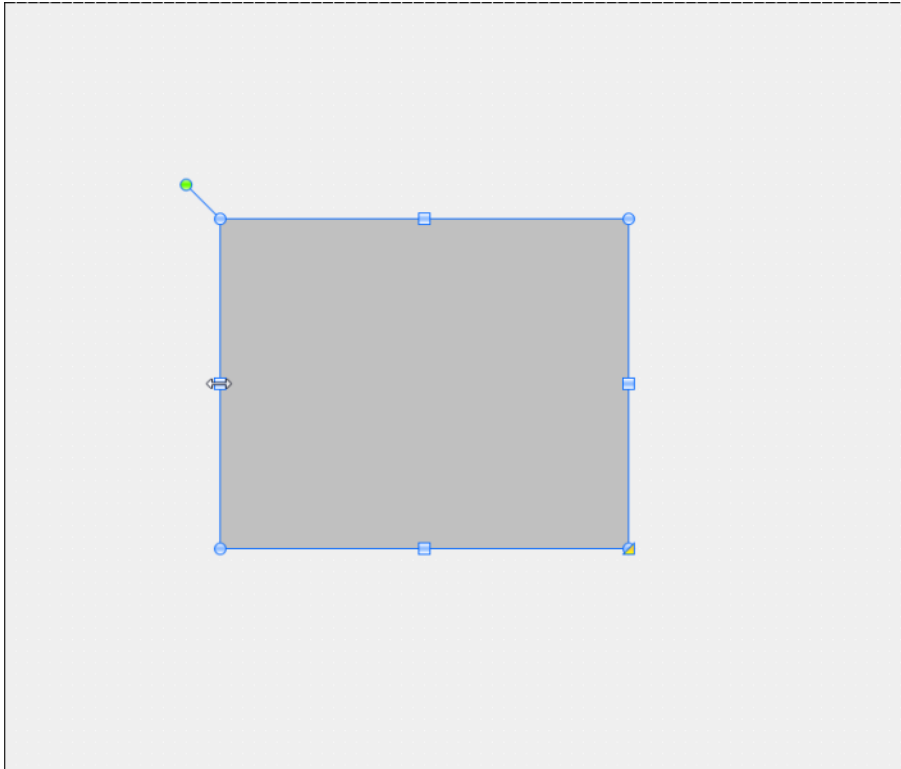
You also receive help instructions for the properties when the elements are created. To do this, activate the help window in zenon.

CHANGE ELEMENT SIZE

In order to change the size of an element, you can use the mouse, keyboard, properties or a dialog:

- ▶ With the mouse:
 - a) Click on one of the handles of the element frame
 - b) drag the element to the desired size
- ▶ With the keyboard:
 - Activate the desired sizing handle (mouse pointer must be over the sizing handle)
 - Drag it with the cursor keys:
 - By pressing a cursor key you change the position by 1 pixel.
 - With the `Shift` key: + cursor: By pressing a cursor key you change the position by 10 pixel.
- ▶ With the property window: In the property group `Position` you can enter the position and the size of the element accurate to the last pixel.

- ▶ With a dialog: Double clicking a handle opens a dialog in which you can enter the position accurate to the last pixel.



Note: If, for the `Graphic` size property, `original size` has been selected for the value with the element multibin, combined element, button or switch, then the width and height of the respective graphics file can no longer be changed.

ROTATE ELEMENT

Elements can be rotated freely. The pivot point is set with the properties in the group `Reference point`.

You set the rotation angle as follows:

- ▶ With the mouse: Click on the element and rotate it with the help of the green handle.
- ▶ With the property window: With property `Rotation angle [°]` in group `Position`.
- ▶ With a dialog: A dialog is opened, in which you can enter the rotation angle, by double clicking the green handle.



Information

Window-based screen elements such as ActiveX, lists or combobox/listbox cannot be rotated in Runtime. Configuration in the Editor is possible for ActiveX, but this has no effect on the display in Runtime.

ROW HEIGHT

The row height can be defined for certain elements, regardless of the font size, using the `Representation/Line height [pixel]` property. The default value is 0 pixels. The row height is thus set regardless of the font size. Each value above 0 defines a fixed value in pixels for the row height. If a line height is defined, then graphical illustrations are not scaled according to the line height but adapted to the font size.

Attention: If the row height

- ▶ is selected is too large, nothing is displayed in Runtime in certain circumstances.
- ▶ is selected as smaller than the font size, then graphical illustrations are cut off.

IN THE RUNTIME

ORDER

In Runtime, the following sequence is generally applicable for the display of elements, from top to bottom:

- ▶ WPF element, always in the foreground
- ▶ ActiveX Element, always in the foreground, except if it is overlaid by a WPF element
- ▶ Dynamic elements and vector elements

MOVEMENT

Movement of elements is interpreted as follows:

Rotate first (static and dynamic), then zoom dynamically, X and Y).

COVERED ELEMENTS

The following applies for overlaid elements:

- ▶ If a vector element overlays a dynamic element:
 - the dynamic elements or the overlaid part is not displayed
 - The dynamic elements can be operated, even if they are fully covered.
- ▶ If several dynamic elements are overlaid, only the visible (clickable) parts can be operated.



Information

Elements that are covered in Runtime can be controlled with the keyboard. For details on configuration, see the Runtime manual, Defining sequences in frames chapter.

VECTOR ELEMENTS IN ZENON:

You create vector elements in zenon with the character editor. Select the desired element in the Elements toolbar (on page 22) and place it in the main window using the mouse. Configure the properties with the **Properties** window. The element must be selected in the main window to do this.

Element	Properties
Ellipse (on page 99)	With frame and fill color, type of frame and fill pattern
Circle (on page 99)	Select the ellipse symbol and hold down the <code>Shift</code> key when drawing; with frame and fill color; type of frame and fill pattern
Arc of a circle (on page 100)	With definable line thickness, color and type
Segment of a circle (on page 100)	With definable line thickness, color and type
Line (on page 103)	With definable line thickness, color and type
Polygon (on page 112)	With frame and fill color, type of frame and fill pattern
Polyline (on page 114)	With line type and color (also filling pattern and color for an area description)
Square (on page 116)	select Rectangle symbol, hold down the <code>Shift</code> key when drawing; with frame and fill color; type of frame and fill pattern
Rectangle (on page 115)	with frame and fill color, type of frame and fill pattern
Rounded rectangle (on page 115)	with frame and fill color, type of frame and fill pattern
Pipe (on page 116)	With frame and fill color, type of frame and fill pattern
Static text (on page 118)	With font color and selection of the type of font

IMPORTING YOUR OWN VECTOR GRAPHICS

Vector elements that have been created in external programs can be imported as a screen and included. To do this, go to *Files-> Graphics -> Add file in the project manager*.

Note: Import of vector graphics is not available for the 64-bit Editor.

DYNAMIC ELEMENTS IN ZENON

You create dynamic screen elements in zenon with the character editor. Select the desired element in the Elements toolbar (on page 22) and place it in the main window using the mouse. Configure the properties with the Properties window. The element must be activated in the main window to do this. Graphic elements can be activated directly here through variables. For many elements, a configuration dialog is shown when they are being created.

Dynamic elements in zenon:

Element	Function
ActiveX (on page 41)	Inserts any desired ActiveX controls. These must already be installed on the computer.
Bar Graph (on page 44)	Displays the size of a signal in bar form. In doing so, the length of the bar changes with the signal size.
Command Element (on page 45)	Makes it possible to send commands for the Command module. Requires license forSICAM 230.
Screen Alarm Button (on page 45)	Enables alarming with color and flashing via the screen. Requires license forSICAM 230.
Bitmap button (on page 49)	<p>Links a graphics file (pixel graphics: *.bmp, *.jpg, *.gif, or *.png or vector graphics: *.wmf) with a button.</p> <p>Attention! This element is only available if the project property <code>Create RT files for</code> has been set to lower than 6.50. This function has been integrated into the element button from version 6.50.</p>
Button (on page 45)	<p>Enables actions such as "execute function" or "write set value" to be instigated. It can display text and graphics and be created as a transparent object via other elements.</p> <p>Attention! If the project property <code>Create RT files for</code> is set to lower than 6.50, only text output is displayed in runtime. Graphics and the <code>invisible</code> function must then be configured with the <code>bitmap button</code> and the <code>invisible</code> button elements. You then find these two elements at the bottom of the <code>elements</code> drop-down list.</p>
Combined element (on page 53)	Displays statuses of variables via symbols, screens and texts in graphic form also be used as a switch or as a button.

Combo-/Listbox (on page 91)	Displays a text in a combo box or a list box regardless of variable value. When an entry is selected, the attendant value is sent or the attendant function is executed.
Dynamic Text (on page 98)	Displays the value of a string variable in alphanumeric form or the current limit text of numeric variables.
Message element (on page 103)	Reads text from a text file, depending on two variables, and displays this.
Multi-binary element (on page 105)	Enables, independently of variable values, a graphic to be displayed or symbols to be colored and a status text to be provided.
Switch (on page 118)	Displays values of a binary variable and modifies these.
Move Symbol (on page 120)	Enables a symbol to be moved, rotated and changed in size regardless of variable values.
Trend Element (on page 120)	Displays values in the form of trend curves.
Clock (on page 122)	Displays the current time and date.
Universal slider (on page 124)	Provides sliders in different graphical forms.
Invisible button (on page 51)	Transparent object, with which actions such as "execute function" or "write set value" can be triggered. Attention! This element is only available if the project property <code>Create RT files for</code> has been set to lower than 6.50. This function has been integrated into the <code>button</code> element from version 6.50.
WPF Element (on page 149)	Displays WPF-XAML files in zenon.
Numerical value (on page 202)	Displays the value of a variable in numerical form.
Indicating instrument (on page 203)	Displays the value of a variable in the form of an analog measuring tool with a indicator as display element.
Status Element (on page 204)	Transfers properties from linked variables to a symbol and displays statistical limit texts.

DEFINE PROPERTIES

For many dynamic elements, a configuration dialog opens to select variables and/or functions that define the elements in runtime. The properties can also be set independently of the configuration dialog in the properties window. They can be changed at any time here. The corresponding element must be activated in the main window to do this.

You can also select several elements at the same time and assign these common properties. For this, the following applies:

- ▶ Different values for different properties are marked in red.
- ▶ Properties which cannot be changed jointly are deactivated.

You also receive help instructions for the properties when the elements are created. To do this, activate the properties list in zenon.

DISPLAY IN THE MAIN WINDOW

You can obtain information on a dynamic element in the main window by:

Tool tip when the mouse is moved over it:

- ▶ Element type
- ▶ Element name
- ▶ Function name/function type
- ▶ Linked variables

In the status bar on activation:

- ▶ Mouse pointer position
- ▶ Element type
- ▶ Element name
- ▶ Start point
- ▶ Width/height

10.1 .NET Controls

The ActiveX control `CD_DotNetControlContainer.Container` makes it possible to use any .NET Windows Forms Controls as dynamic elements in zenon. In doing so, all functions implemented in the .NET control are supported. It can be used with all zenon versions from 5.50 on which support ActiveX.

Note: .NET Framework 3.5 or higher must be available.

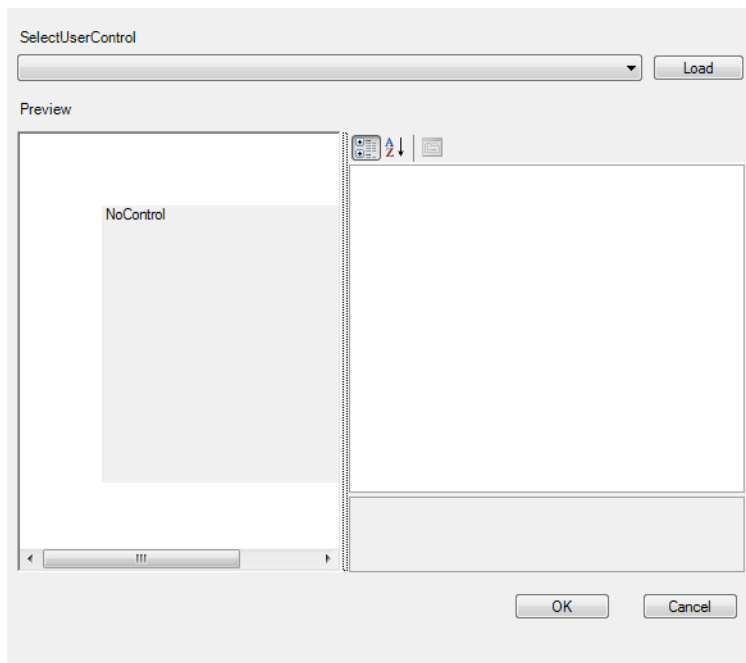


Information

You can read more about the use of .NET with zenon in the Programming interfaces manual in the .NET chapter.

To use the ActiveX control `CD_DotNetControlContainer.Container`:

1. create a dynamic element of the type ActiveX (on page 41)
2. select `CD_DotNetControlContainer.Container` from the list of available controls
3. click on button **Properties**
4. the dialog for configuring the control opens



Parameters	Description
Load	Opens the file manager for selecting a .NET Control Assembly . Note: The .NET Control Assembly must be in the same folder as Runtime. It is always the absolute path to the .NET Control Assembly that is saved, e.g.: C:\Controls\Assembly.dll.
SelectUserControl	Selection of the .NET Controls from the ones available in the selected .NET Control Assembly .
Preview	Displays the absolute path to the .NET Control Assembly . Field left below: Preview of the control. Field right below: List of properties for the selected .NET Control .
Symbol: By categories	Displays properties sorted by categories.
Symbol: Alphabetical	Display properties in alphabetic order.
Symbol: Property pages	Displays property pages.
OK	Confirms configuration. This is then saved in the zenon ActiveX element as XML stream.
Cancel	Discards configuration.

10.2 ActiveX

You connect ActiveX elements in projects using the **ActiveX** dynamic element.



Information

You can read more about the use of ActiveX with zenon in the Programming interfaces manual in the ActiveX chapter.

To create ActiveX in a screen:

1. Select the symbol **ActiveX** in the **Elements** toolbar.
2. select the start point in the main window
3. pull the control element open while pressing and holding the left mouse button

4. a configuration dialog opens, in which you can select the element and configure it
5. The shape, size and position can be changed at any time by pulling the vertexes or moving the element
6. if you press and hold `alt` while pulling the outer corner points, the change is carried out symmetrically

You define individual properties of the element in the property window. In order to do this, the element must be active (mouse click) in the main window. To subsequently select or change controls, open the configuration dialog by double-clicking on the properties menu item in the context menu.

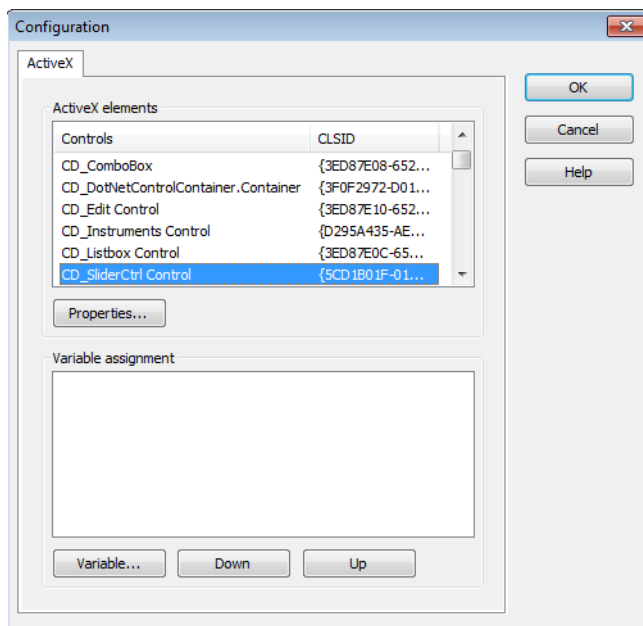


Attention

Only ActiveX elements that are installed and registered on the computer are shown. Please ensure that all ActiveX elements are also installed on all Runtime systems on which you use the project.

You can also use Remote Transport to register ActiveX elements on remote systems. See: Define files (copy®ister)

ACTIVEX CONFIGURATION



Element	Function
ActiveX elements	List of all ActiveX elements available.
Properties	Opens a configuration dialog for the ActiveX highlighted, if available. You can obtain help and information about the configuration from the manufacturer of the respective ActiveX control.
Linking variables	List of variables linked to the ActiveX element.
Variable	Opens the zenon Dialog to select variables if it is possible to link variables.
Down	Sorts highlighted variables downwards.
Up	Sorts highlighted variables upwards.

POSITION CHANGE IN RUNTIME

Windowed ActiveX controls work with untransformed mouse coordinates in Runtime. If an element is rotated, stretched or otherwise changed in terms of its size or position, the control no longer fits and continues to be executed at the original position. The transformed element can therefore no longer be operated at its transformed position using the control.

Windowless ActiveX controls can work with transformed mouse coordinates in Runtime. If an element is rotated, stretched or its position is otherwise changed, the control works if the following requirements have been met:

- ▶ Does not work under Windows CE.
- ▶ Does not contain a control in windowless ActiveX
- ▶ Windowless ActiveX supported transformed characters correctly



Information

Regard the difference between windowed and windowless ActiveX elements.

Windowed ActiveX elements (e.g. all Microsoft ActiveX Controls) are always in the foreground.

In contrast you can place for example a dynamic element over windowless ActiveX elements.

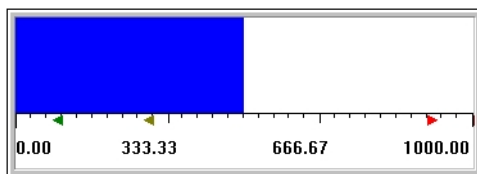
10.3 Bar display

You show the numerical size of a signal with the **Bar display** dynamic element. The length of the bar changes with the signal size in runtime.

To create **Bar display** in a screen:

1. select the **Bar display** symbol in the **Elements** tool bar or in the **Elements** drop-down list
2. select the start point in the main window
3. pull open the element while pressing and holding the left mouse button
4. the dialog to assign a variable (on page 254) opens
5. The shape, size and position can be changed at any time by pulling the vertexes or moving the element
6. if you press and hold **alt** while pulling the outer corner points, the change is carried out symmetrically

You define individual properties of the element in the **Properties window**. In order to do this, the element must be active (mouse click) in the **Main window**.



To edit the linked variable:

1. open the variables in the Project Manager Detail view,
2. drag the desired variable onto the element while holding the left mouse button
3. the previous variable is substituted by the new one

COLOR-CODED DISPLAY OF THE LIMIT VIOLATION

At limit violations the color from the variable can color the whole area or only the area starting from the limit violation. This functionality is controlled via property **Explicit in group Representation**.

This property affects only the display of values with defined limits from variables. Limits from reaction matrices are not considered.

Active: If a limit value of the linked variable is breached, only the part of the display that goes into the limit value breach is shown in the color of the respective limit value.

If the variable has several defined limit values, the corresponding areas of the display are each shown in the color of the limit value.

Inactive: If a limit of the linked variable is violated, the complete display is displayed in the color of the violated limit.

Default: `inactive`

10.4 Command element

Makes it possible to send commands for module Command. Requires license for SICAM 230.

You can find instructions on how to use elements in the help at SICAM 230.

10.5 Button for screen alarming

Attention: The `button for screen alarming` requires a license for SICAM 230. You can find further instructions on how to use elements in the help at SICAM 230.

10.6 Button

You create a freely adjustable button the the dynamic element `button` which you can use interactively in the screen to either carry out a function or as a switch for a binary variable.

The button can

- ▶ display a graphics file
- ▶ animate a graphics file
- ▶ be displayed invisibly



Information

Buttons are subdivided into text button, bitmap button and invisible button in versions up to and including version 6.22. From version 6.50, all properties that can be configured with buttons are together in the element button.

To create the dynamic element button in a screen:

1. Select the `Button` symbol in the **E**lements tool bar
2. select the start point in the main window
3. pull open the element while pressing and holding the left mouse button
4. The Selection dialog functions (on page 253) open
5. select the desired function
6. Define the desired properties in the properties window

Hint: You can round (on page 206) the corners as you wish

7. You add variables by dragging & dropping

LABELING

To label the button:

- ▶ Click in the element.
- ▶ enter the text
- ▶ define the text properties in the `Representation` node

UNDERLINE

To underline text, place a & in front of the text to be underlined.

&Text becomes:



If you would like to use the character '&' in text, enter it twice:

1 && 2 becomes 1 & 2.

LINE BREAK

To define a line break, use the string `\n`.

Example:

`Line 1 \n`

`Line 2`

BUTTON AS SWITCH

To use the button as a switch:

1. activate the `Switch` property in the `Write set value` node
2. You activate settings to use the button as a momentary switch with the `Momentary switch` property
3. Link the button with a binary variable (node `Variable / function`, property `Variable`)

BUTTON TO EXECUTE A FUNCTION

To link a button to a function:

1. deactivate the `Switch` property in the `Write set value` node
2. Link the button with a binary variable (node `Variable / function`, property `Function`)

BUTTON WITH GRAPHICS

To put graphics on the button:

1. activate the element
2. define the desired graphics for the different switch states in the `Representation` node via `Graphics file` properties and "Pressed button graphics". You can use the following graphics files: Pixel graphics: `*.bmp`, `*.jpg`, `*.gif`, or `*.png` or vector graphics: `*.wmf`.

A button with graphics has a thin 3D frame line as standard, which covers a pixel on each side of the graphic. If the graphics are to be visible, then:

- ▶ In the button properties, select the `Transparency border color [%]` property in the `Color` group
 - with the value `100`

or

- ▶ Activate the `Transparent` property to deactivate background color and frame color

This causes the 3D frame line to not be displayed and the whole graphic is visible.

INVISIBLE BUTTON

to define an interactive, transparent user interface:

1. activate the element
2. definite the `Transparent` property in the `Color` node
3. remove all labeling from the button
4. Access to Runtime:
 - The mouse pointer changes when the mouse is moved over the element
 - over a defined key combination (`Runtime node`, `Key combination` property)



Info

The status of the variable cannot be displayed for the invisible button.

10.6.1 Animate graphics

GIF graphics files can be animated in the dynamic element button:

1. assign a GIF file to a button in the `Representation` node via `Property Graphics file`
2. select the property `GIF animation` in the same node
3. choose between `Always` or animation only if a Boolean variable has a value of 1: To do this, link the properties of both properties `Variable`

10.6.2 Bitmap Button (up to version 6.22 only)

Links a graphics file (pixel graphics: *.bmp, *.jpg, *.gif, or *.png or vector graphics: *.wmf) with a button.

If the project property `Create RT files for` is set to small 6.50, the element button can only display texts in runtime. Graphics must be configured by means of the bitmap button in this case.

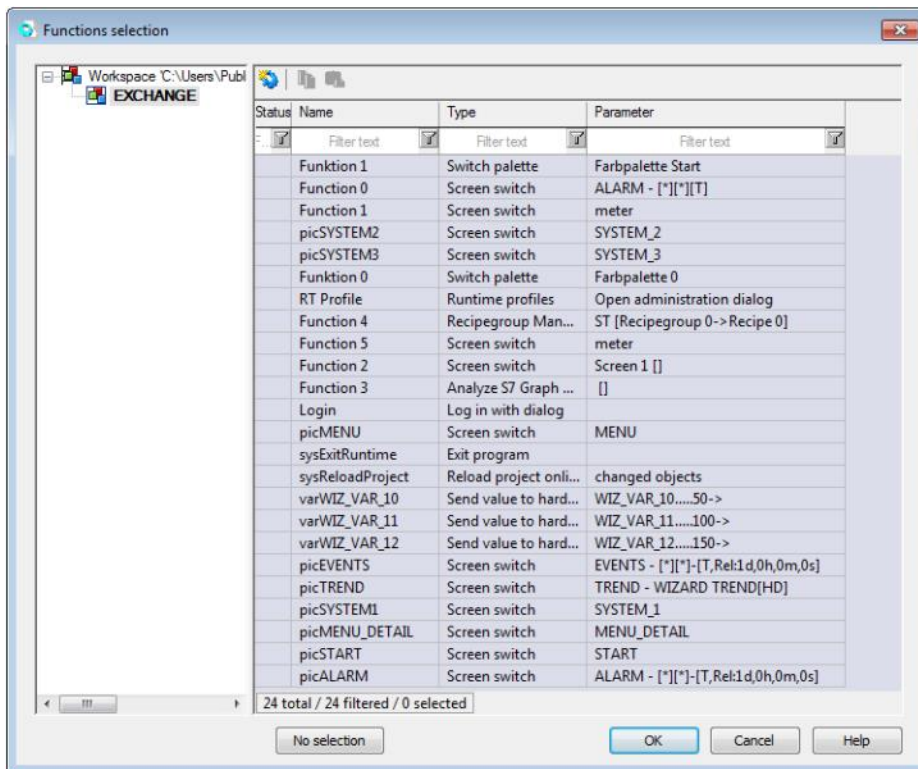
Engineering buttons for different Runtime versions:

Button for	Create RT files for <6.50 AM	from 6.50
Text	Button	Button
Graphics	Bitmap button	Button
invisible	Invisible button	Button

to activate a bitmap button:

- ▶ select the `Bitmap button` symbol in the **E**lements tool bar
- ▶ select the start point in the main window
- ▶ pull open the element while pressing and holding the left mouse button
- ▶ a dialog opens, in which you can link the desired function to the element
- ▶ The shape, size and position can be changed at any time by pulling the vertexes or moving the element
- ▶ if you press and hold `alt` while pulling the outer corner points, the change is carried out symmetrically
- ▶ You define individual properties of the element in the property window. In order to do this, the element must be active (mouse click) in the main window.

In order to select functions, a filtered dialog is opened:



Element	Description
Project tree	Definition of the project from which the function should be selected.
Selection window	Selection of the function.
No selection	Depending on the element: <ul style="list-style-type: none"> ▶ the dialog is canceled ▶ already linked functions are deleted

Hint: The size of this dialog can be adjusted. The dialog size and position are saved.

CHANGE LINKED FUNCTION

- manually
 - in the Project Manager's Detail view open the functions
 - drag the desired function on the element while holding the left mouse button
 - the previous function is substituted by the new one

2. automatic

- Select the entry `Replace links` from the context menu. For more details see chapter `Substitution of variables and functions in dynamic elements` (on page 240).

GIF graphics files can be animated in the dynamic element button:

1. assign a GIF file to a button in the `Representation` node via `Property Graphics file`
2. select the property `GIF animation` in the same node
3. choose between `Always` or animation only if a Boolean variable has a value of 1: To do this, link the properties of both properties `Variable`

10.6.3 Invisible button (up to version 6.22 only)

If the project property `Create RT files for` is set to small 6.50, the element button can only display texts in runtime. Invisible buttons must be configured with the invisible button element in this case.

Engineering buttons for different Runtime versions:

Button for	Create RT files for <6.50 AM	from 6.50
Text	Button	Button
Graphics	Bitmap button	Button
invisible	Invisible button	Button

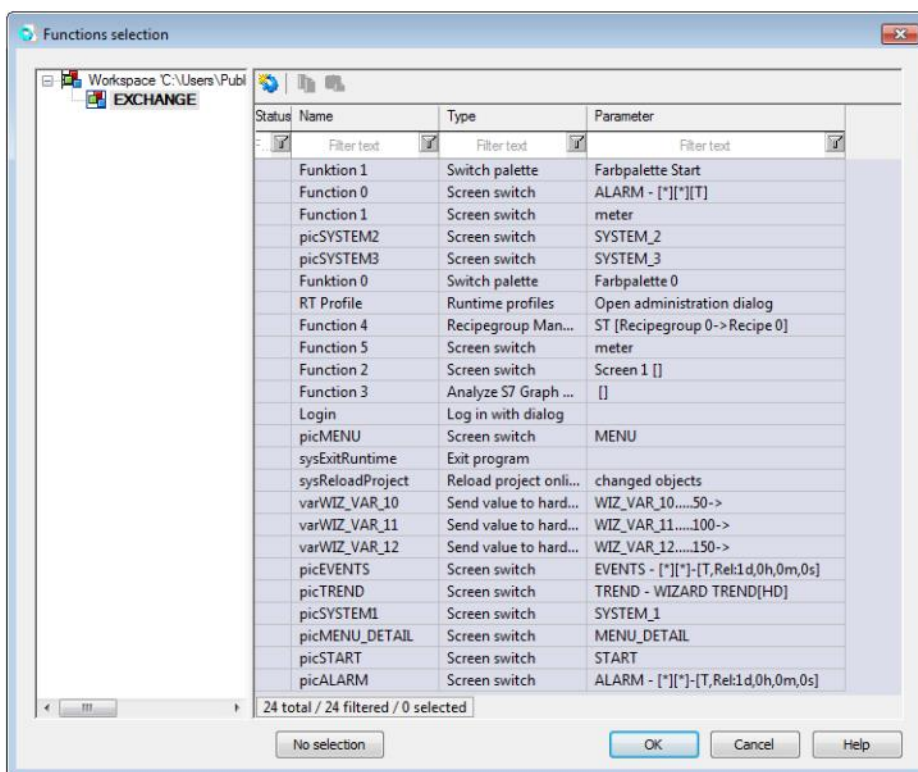
The dynamic element `Invisible Button` offers the possibility to define an interactive transparent user interface which is linked to a function call.

To activate an invisible button:

- ▶ select the `Invisible Button` symbol in the `Elements` tool bar or in the `Elements` drop-down list
- ▶ select the start point in the main window
- ▶ pull open the element while pressing and holding the left mouse button
- ▶ a dialog opens, in which you can link the desired function to the element

- ▶ The shape, size and position can be changed at any time by pulling the vertexes or moving the element
- ▶ if you press and hold the alt key while pulling the outer corner points, the change is carried out symmetrically
- ▶ You define individual properties of the element in the property window. In order to do this, the element must be active (mouse click) in the main window.

In order to select functions, a filtered dialog is opened:



Element	Description
Project tree	Definition of the project from which the function should be selected.
Selection window	Selection of the function.
No selection	Depending on the element: <ul style="list-style-type: none"> ▶ the dialog is canceled ▶ already linked functions are deleted

Hint: The size of this dialog can be adjusted. The dialog size and position are saved.

CHANGE LINKED FUNCTION

1. manually
 - in the Project Manager's Detail view open the functions
 - drag the desired function on the element while holding the left mouse button
 - the previous function is substituted by the new one
2. automatic

Select the entry Replace links from the context menu. For more details see chapter Substitution of variables and functions in dynamic elements (on page 240).



Info

For the invisible button the status of the variable cannot be displayed.

10.7 Combined element

The combined element is a dynamic element that can be used universally and can adopt the most varied graphic characteristics:

- ▶ Graphics
- ▶ Symbol from library
- ▶ Symbol embedded in screens
- ▶ Text

The form of the display is defined through statuses. Variable values of the main value, values of further values and status information from all linked variables can all serve as statuses. Links can be created as desired via formulas.

Statuses of the main variables (limit attributes) can be transferred directly to the combined element. The combined element also supports the setting of set values in the form of a switcher/momentary switch as well as the sending of and sending functions and serves to implement technical process-related elements for Automatic Line Coloring.

If set values are set via command and a response variable is set in the combined element dynamic element, it can be set regardless of the setting of the `Setting values active` property. All action

buttons in the command screen that trigger a direct modification of the response variable are then set to invisible.

CREATE A COMBINED ELEMENT

To create a combined element in a screen:

1. Click on the Combined Element symbol in the Elements toolbar (on page 22) and drag the element to the main window with the mouse.
2. The variable selection dialog opens, filtered for numeric variables.
3. Select the desired variable
4. The Assistant (on page 56) for combined element settings opens and guides you through the basic settings. If you prefer to define all settings manually, click on cancel now. You can find details in the Assistant. (on page 56) chapter

When setting up manually, define the `Type of display` in the `Representation` node. The symbol from the library is given as a default. You can define screen data and text according to the settings.

You define additional statuses either in the assistant via the `New Status` or in `Combined Element Properties` in the display with property node `Configuration and test`.

Functions and variables can be assigned to the combined element by dragging & dropping. In doing so, the respective variables/functions are each replaced by the new ones.



Attention

Symbols in a "Combined" element cannot be operated.

Exception: Symbols from the library can be created as clickable buttons (on page 61).

LINK RULES

If you have selected `Symbol from Library` as a display type, you can enter link rules. You open the dialog for entering the element via the `Configuration and test` property. After selecting the symbol via the `Symbol Select` button, you can create and edit linking rules. These rules are saved for every status.

 **Example**

Variables/functions contained in the symbol:

Var_SWITCH_0010
Var_TEMPERATURE_0010
Fct_ShowTrend_0010
Fct_Help_0000

The variables and functions of the symbol are now replaced with the following rule:

Source: *_0010

replace with: _0020

result of linking rule:

Var_SWITCH_0020
Var_TEMPERATURE_0020
Fct_ShowTrend_0020
Fct_Help_0000

With the help of the linking rule, all variables and functions can be exchanged. If a variable or function does not fit into the scheme, that link cannot be replaced.

When the runtime files are created, the respective links are set for every status, according to the rule.

 **Example**

You would like to graphically display if a motor is switched on and in which direction it is turning.

Information about run direction and on/off state comes from the variables on the control side. The status text displays whether the motor is turning and how it is turning.

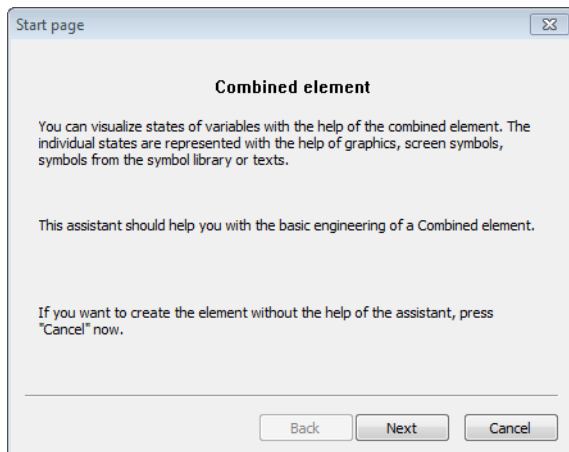
- ▶ Select Properties -> Display Type -> Status Text.
- ▶ Open the Enter Element dialog by clicking on `Configuration` and `test`.
- ▶ Enter the status text which you want to allocate to the respective value.

It is subsequently displayed in your motor during runtime, for example: 'left', 'right' or no text at all if the motor is not turning.

You will find more information about the evaluation of the status bits in the chapter Statuses (on page 65).

10.7.1 Assistant

An assistant is available for the basic configuration of the combined element. This opens as soon as you have selected a variable for the combined element.



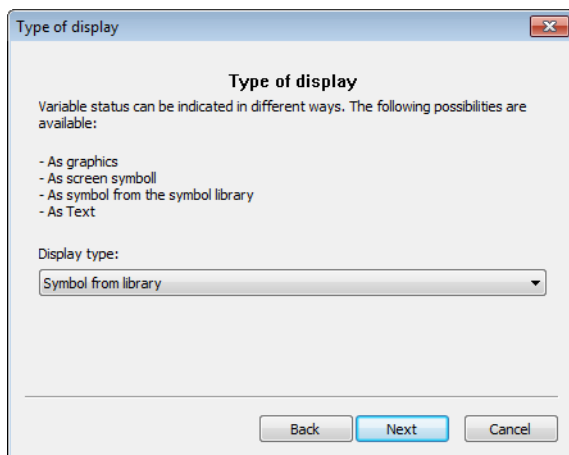
In the first step, you select the display type. The following display types are available:

- Symbol from library
- Status Text and Screen Symbol
- Bitmap and Screen Symbol
- Screen Symbol Only



Information

You can define additional statuses in all status selection windows. The New Status button is available for this.



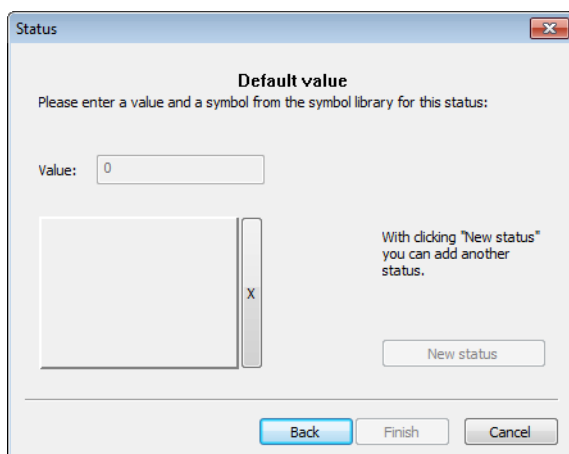
Default: Symbol from library.

This setting is also displayed as standard in the properties if you create the combined element without the assistant.

You can define statuses as soon as you have selected a type of display. The first status is always the default status.

Hint: A value cannot be entered for the default status; a value must be entered for all other statuses. You can only edit one status at a time.

SYMBOL FROM LIBRARY



Click on the empty window at the bottom left to select a symbol from the global symbol library or from the project library. You can delete the selected symbol again by clicking on the X next to the window.

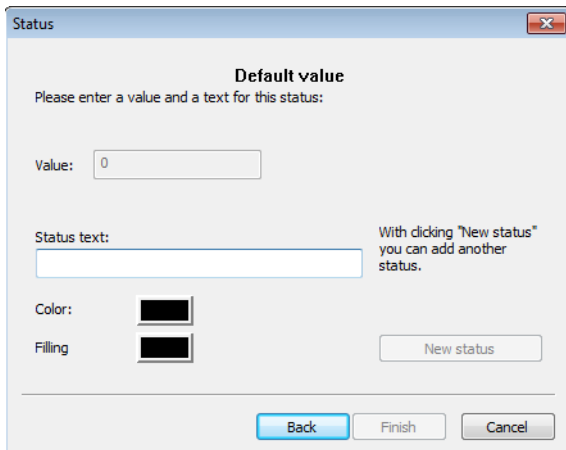
Setting	Description
Value	Numerical value at which the status becomes active. Default: no value From 2. Status: Entry required.
New status	Creates a new status for the combined element.



Information

For Symbol from library, clickable buttons (on page 61) can be created in any form.

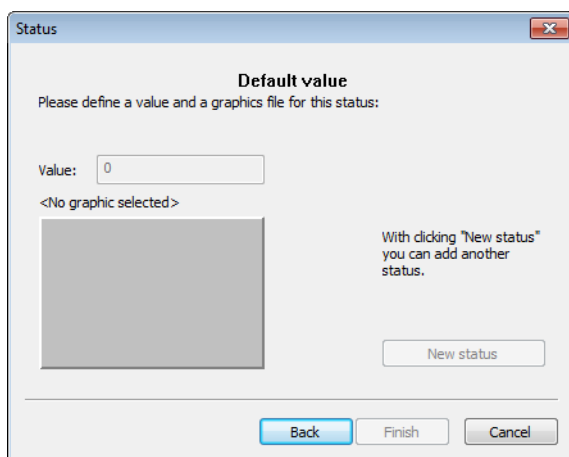
STATUS TEXT AND SCREEN SYMBOL



Each condition can be labeled with a text and with a foreground and background color.

Setting	Description
Value	Numerical value at which the status becomes active. Default: no value From 2. Status: Entry required.
Status text	Text as it is displayed in runtime.
Color	Font color of the status text.
Fill color	Background color of the status text.
New status	Creates a new status for the combined element.

BITMAP AND SCREEN SYMBOL



Click on the **<No graphic selected>** button at the bottom left to select a screen file (*.bmp, *.gif, *.jpg, *.png etc.). You have two options for screen selection:

1. Pictures from the project:

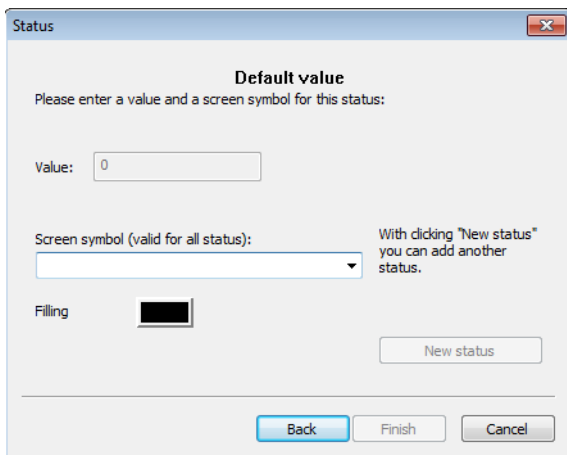
Pictures which you have already stored in the graphics directory of a project (see chapter on Editor -> Project Manager -> Files) are offered to you automatically by the assistant.

2. Absolute path to other directories:

- Activate direct file selection for this
- The window switches to direct selection
- Click on the button ...
- Select the corresponding file with the explorer

Setting	Description
Value	Numerical value at which the status becomes active. Default: no value From 2. Status: Entry required.
New status	Creates a new status for the combined element.

SCREEN SYMBOL ONLY



You can give a common symbol for all combined element statuses.
This symbol:

- ▶ must already be present on the screen
- ▶ applies for all statuses
- ▶ can be labeled for each status with its own fill color

Setting	Description
Value	Numerical value at which the status becomes active. Default: no value From 2. Status: Entry required.
Screen symbol	Drop-down list to select a symbol. If no symbols are displayed, then no symbols are present in the current screen.
Fill color	Names the allocated status.
New status	Creates a new status for the combined element.

10.7.2 Clickable buttons in any desired form

In the combined element, clickable buttons can also be created in any desired form.



Information

This option is available from version 6.51. For projects for earlier versions, the property is treated as inactive.

To create clickable buttons in any form desired:

1. Create a combined element in the `Symbol` from `libraryattributes`
2. In combined element properties, activate the `Symbol` form defines the click area property in the `Representation` node



Information

This property does not work under Windows CE, because the required functionality is not available under Windows CE.

ELEMENTS

There can be further symbols or combined elements in the symbol. These are triggered correctly corresponding to the click area. For symbols, the element limits are used completely normally, with a

combined element this depends on the `Symbol` form defines the `click area` property, either the individual click areas of the elements or the environment rectangle of the combined element.

The following elements have their own special click area:

- ▶ Rounded rectangle (present as its own vector element up to version 6.50)
- ▶ Button
- ▶ Combined element with "Symbol form for click area" property
- ▶ Circle
- ▶ Segment of a circle
- ▶ Arc of a circle
- ▶ Line
- ▶ Pipeline
- ▶ Polygon
- ▶ Polyline
- ▶ Rectangle
- ▶ Static text
- ▶ Symbol (correct click areas of the symbol elements are used)

All other elements have their surround as a click area.

SPECIAL ATTRIBUTES

Special attribute	Effect
<p>Are never treated specially:</p> <ul style="list-style-type: none"> ▶ Type of line ▶ Filling pattern ▶ Transparencies of all type (except text element) 	<p>Areas are always clickable.</p>
<p>Transparency for static test:</p> <p>Elements behave as though the element did not exist. As a result, it is possible to name elements without unintentionally enlarging the click area.</p>	<p>Does not influence the click area.</p> <p>Hint: If a transparent text element is to influence the click area:</p> <ul style="list-style-type: none"> ▶ Deactivate the <code>Transparent</code> property ▶ Place a transparent element over or under this manually
<p>Button</p>	<p>Is used for the click area; GIF animation for "pressed" is not available here. This corresponds to the behavior with an inactive <code>Symbol form</code> defines the click area property.</p>
<p>Symbol protrudes from the combined element.</p>	<p>Symbol is displayed, but clicks are only interpreted within the combined element.</p> <p>Comment: If elements protrude outside symbol limits or symbols protrude out from the limits of a combined element, this can lead to display problems and blurring effects.</p>

CLICK AREAS

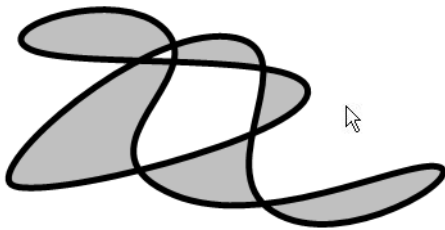
In the Editor, areas larger than the click area are sometimes defined, in order to make these easier to click on. For example, a line with 1 pixel thickness in the editor can be selected using a width of 8 pixels.

The display of the click area is exact in Runtime. For example, a line of 1 pixel thickness is also only selectable from a width of 1 pixel.

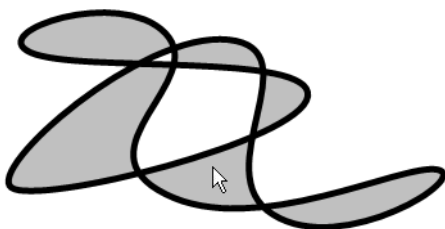
The calculation of the click area for the combined element works regardless of the `Graphics quality` property's setting. However, a different click area is calculated for the elements regardless of this setting.

**Information**

If the mouse pointer is above the combined element, it is analyzed whether the cursor is in the click area of the element. The load placed on the CPU can then be high with a large number of elements in the combined element symbol.

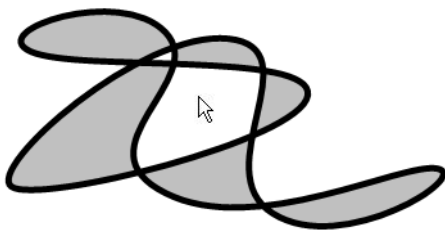
Clickable buttons example**EXAMPLE 1**

status Symbol form defines the click area	Action
active	No click
inactive	Click

EXAMPLE 2

status Symbol form defines the click area	Action
active	Click
inactive	Click

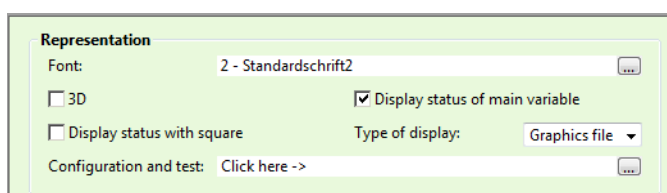
EXAMPLE 3



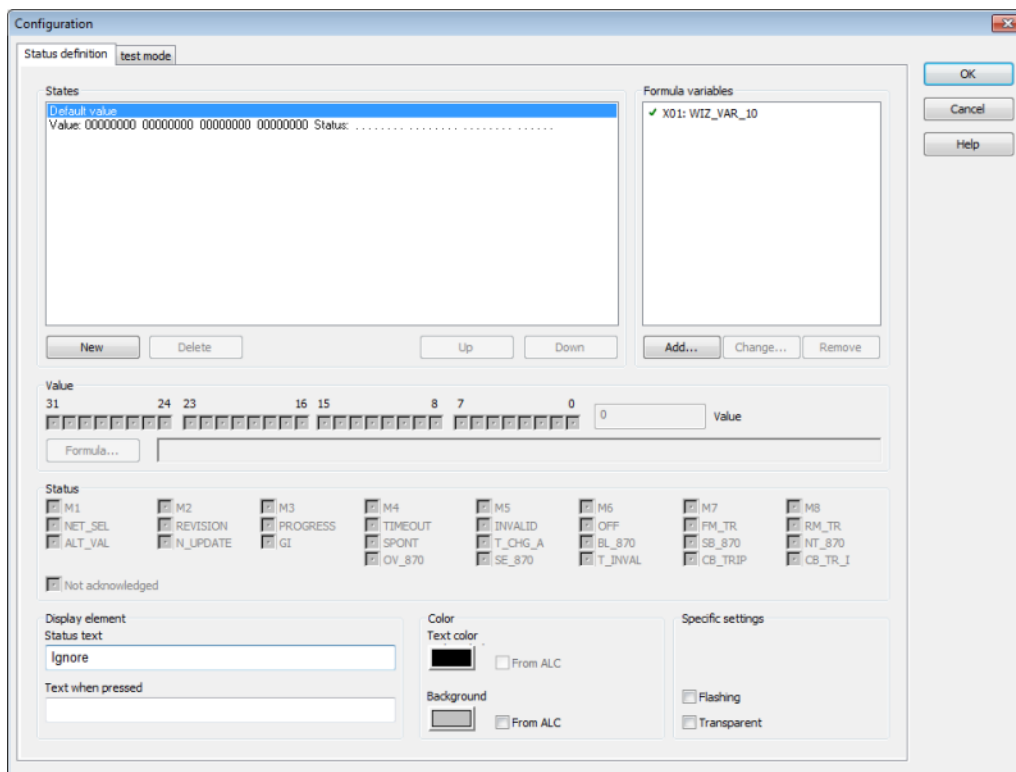
status Symbol form defines the click area	Action
active	No click
inactive	Click

10.7.3 States

You get to the statuses window via the Configuration and test property in the Representation node.



Clicking on the button or on the text "Click Here" opens the window:



Here

- ▶ you edit existing statuses
- ▶ add the new statuses
- ▶ specify in which direction statuses are to be processed.

The settings in the upper part of the window are the same for all types of display. In the lower third, individual settings for the four different types of display are made.

COMMON SETTINGS

STATUS DEFINITION

Lists all defined statuses. A status can consist of values and status. The element is processed from the first status up to the last entry. The first complete match is shown. Exception: The Overlapping property (for symbols from the library) or Chained (for texts) is active.

Parameters	Description
Default value	The status defined when creating the element. It is always in the first position and can longer be changed or deleted.
Value	Shows the defined (32 bit) value.
Status	shows the defined status. An "F" at the end of the status display indicates a formula.
New	Defines new statuses. in doing so, values, status and formulas of the status currently highlighted are taken on as initial values.
Delete	Deletes the selected status. The default status cannot be deleted.
upwards/downwards	changes the order in which statuses are processed. The default status is always in the first position.

FORMULA VARIABLES

shows all variables that were defined for input in formulas. Existing variables are marked with a green tick, non-existent variables are marked with a red cross. Non-existent variables can be replaced by exiting variables via Change. The Add and Change buttons open the dialog to select variables (on page 254).

VALUE

Enables

- ▶ input of a value for a status via a matrix or numerically
- ▶ the definition of a formula

Parameters	Description
Value	Defining the value via a preset bit structure
Value	Enter the numeric value.
Formula	Opens the window to enter formulas (on page 85). In the formula variable area, defined variables are available. Linking is performed by logical, bitwise and comparative operators.

**Attention**

For non-binary variables, the value is entered in the signal resolution. Settings in the measuring range or the non-linear value adjustment are not supported in this element.

STATUS

Enables status information to be requested.

Attention: Most statuses can only be requested if the driver supports the status processing.

No.	Short term	Long name	Comment
0	M1	User status 1	
1	M2	User status 2	
2	M3	User status 3	
3	M4	User status 4	
4	M5	User status 5	
5	M6	User status 6	
6	M7	User status 7	
7	M8	User status 8	
8	NET_SEL	Select in the network	
9	REVISION	Revision	
10	PROGRESS	In process	
11	TIMEOUT	Timeout exceeded	
12	MAN_VAL	Manual value	Only available for formulas
13	M14	User status 14	Only available for formulas
14	M15	User status 15	Only available for formulas
15	M16	User status 16	Only available for formulas
16	GI	General query	
17	SPONT	Spontaneous	
18	INVALID	Invalid	
19	T_CHG_A	Time change announcement	
20	OFF	Switched off	
21	T_EXTERN	Real time external	Only available for formulas
22	T_INTERN	Realtime internal	Only available for formulas
23	N_SORTAB	Not sortable	Only available for formulas
24	FM_TR	Error message transformer value	
25	RM_TR	Working message transformer value	

26	INFO	Information for the variable	
27	ALT_VAL	Substitute value	
28	RES28	Reserved	
29	N_UPDATE	Not updated	
30	T_STD	Standard time	Only available for formulas
31	RES31	Reserved	
32	COT0	Cause of transmission bit 1	Only available for formulas
33	COT1	Cause of transmission bit 2	Only available for formulas
34	COT2	Cause of transmission bit 3	Only available for formulas
35	COT3	Cause of transmission bit 4	Only available for formulas
36	COT4	Cause of transmission bit 5	Only available for formulas
37	COT5	Cause of transmission bit 6	Only available for formulas
38	N_CONF	Negative acceptance of Select by device (IEC60870 [P/N])	Only available for formulas
39	TEST	Test bit (IEC 60870 [T])	
40	WR_ACK	Writing acknowledged	Only available for formulas
41	WR_SUC	Writing successful	Only available for formulas
42	NORM	Normal status	Only available for formulas
43	N_NORM	Deviation from normal status	Only available for formulas
44	BL_870	IEC 60870 Status: blocked	
45	SB_870	IEC 60870 Status: substituted	
46	NT_870	IEC 60870 Status: not topical	
47	OV_870	IEC 60870 Status: overflow	
48	SE_870	IEC 60870 Status: select	
49	T_INVALID	Time invalid	Only available for formulas
50	RES50	reserved	
51	RES51	reserved	

52	RES52	reserved	
53	RES53	reserved	
54	RES54	reserved	
55	RES55	reserved	
56	RES56	reserved	
57	RES57	reserved	
58	RES58	reserved	
59	RES59	reserved	
60	RES60	reserved	
61	RES61	reserved	
62	RES62	reserved	
63	RES63	reserved	



Information

*The short terms for the status bits have been unified for all languages since version 6.50.
You can find more details and how you can use the old short terms in chapter Status bits
- new short terms.*

Not acknowledged: If option Flashing is active for the limit of the variable, the bit not acknowledged is set. With the option Acknowledge flashing also acknowledges alarm in the alarm configuration, the alarm is acknowledged and the bit not acknowledged is set to 0 (see also chapter Acknowledge flashing for alarms).

INDIVIDUAL SETTINGS

Individual settings for the 4 types of display of statuses is available in the subchapters:

Symbol from library (on page 73)

Status Text and Screen Symbol (on page 75)

Bitmap and Screen Symbol (on page 77)

Screen Symbol Only (on page 78)

CONFIGURING THE STATUS FOR VARIABLES THAT HAVE NOT YET BEEN LINKED

Sometimes you must define a combined element but you do not yet have a real, existing variable available. For example, if the combined element is supposed to be used in a symbol of the symbol library and it the variable link will be created only after pulling it into the screen. In this case, you first work with a 'dummy variable', which you then subsequently replace with an existing variable. You can then define all statuses in the combined element if existing variables have not yet been linked. You have no access with dummy variables in the test mode only.

This is how you create a 'dummy' variable:

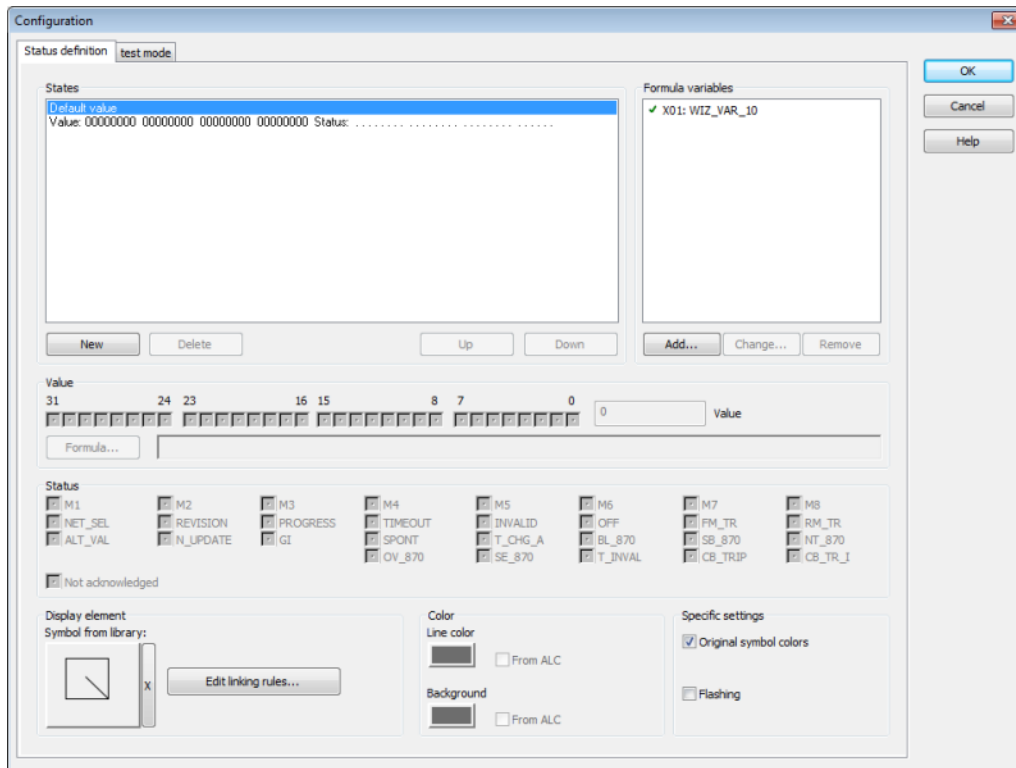
- ▶ Enter a symbolic name into the properties of the combined element in the `Variable` input field.
- ▶ Click in the `Representation` area in the `Configuration` and `test` field: The page statuses in the element input are opened.
- ▶ In the list of formula variables, existing variables are marked with a green check mark. Variables that do not exist are marked with a red X. You can add further variables:
- ▶ Use the `Add` button for existing variables.
With `Change`, you can replace existing and non-existing variables with other variables.
- ▶ To add a non-existent variable, click on `Add` and then on `No selection`. You get a formula variable named after the following scheme: `X00: <empty>`. (00 stands for a two-digit number.)
Highlight the variable and click in the `<empty>` area; assign a label.
If you enter the name of an existing variable, the link is established and the mark changes from a red X to a green check mark.

FORMULAS

Read how a formula is created in the chapter on the Formula Editor (on page 79).

Symbol from library

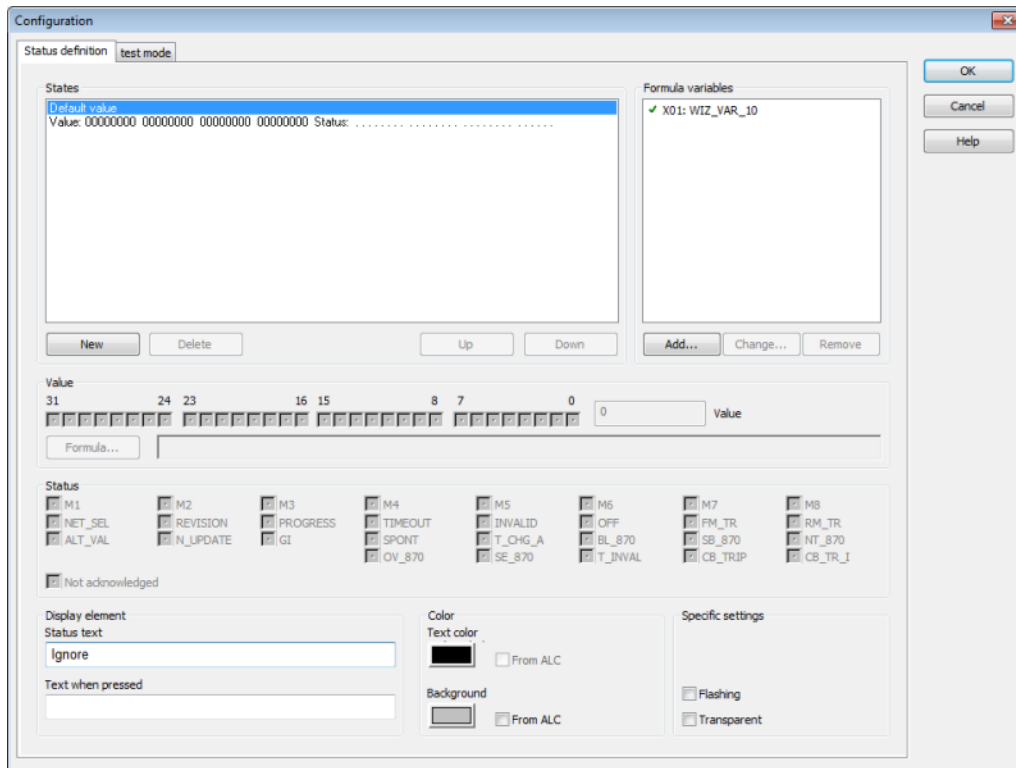
The general settings for all display types can be found in the chapter on statuses (on page 65).



Parameters	Description
Display element	
Symbol from library	<p>Clicking on the symbol opens the dialog to select a symbol.</p> <p>Clicking on the X next to the symbol deletes the selected symbol.</p>
Edit linking rule	<p>Variables and functions contained in the symbol can be exchanged with the help of linking rules.</p> <p>Attention: If a variable or function does not fit into the scheme, that link cannot be replaced.</p>
Colors	Only active if the Original Symbol Colors property in Specific Settings is turned off.
Color	Choice of color.
Fill color	Choice of fill color.
From ALC	The color of the linked source is used.
Specific settings	
Original Symbol Colors	<p>Active: Transfers original color from symbol.</p> <p>Deactivates Take color of main variable property.</p>
Flashing	Active: Symbol flashes in runtime if status has been achieved.

Status Text and Screen Symbol

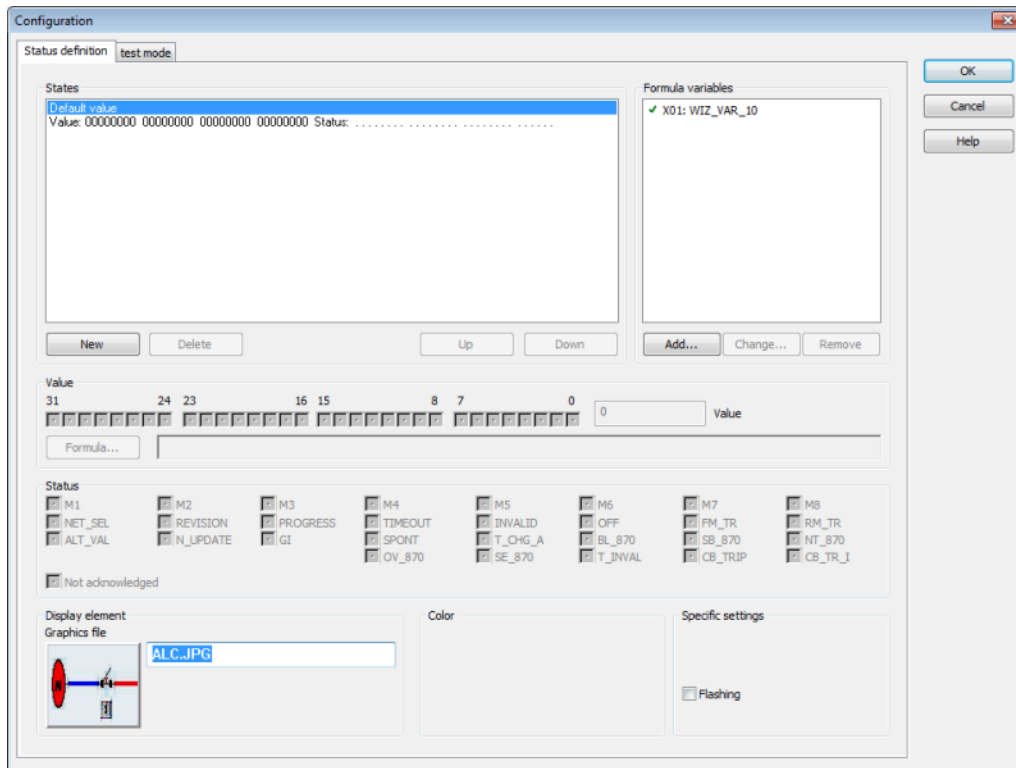
The general settings for all display types can be found in the chapter on statuses (on page 65).



Parameters	Description
Display element	
Status Text	Text for the status.
Text when pressed	Text with pressed Symbol.
Colors	
Color	Choice of color.
Fill color	Choice of fill color.
From ALC	The color of the linked source is used.
Specific settings	
Flashing	Active: Symbol flashes in runtime if status has been achieved.
Transparent	Active: Fill color is set to transparent.

Graphic and screen symbol

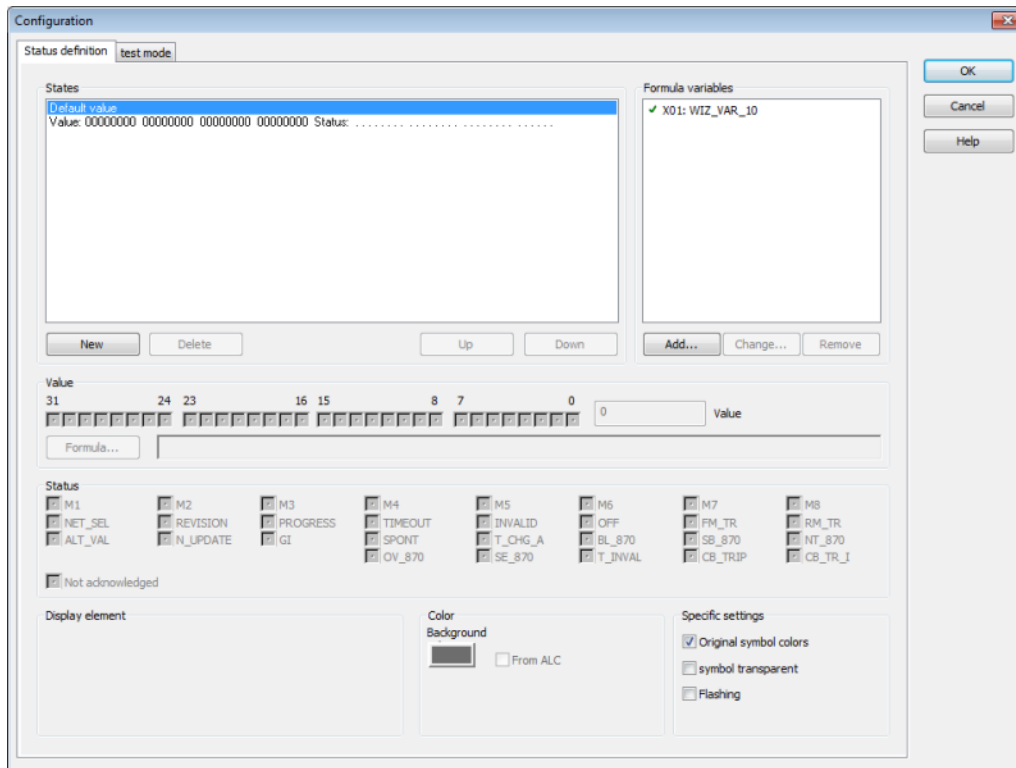
The general settings for all display types can be found in the chapter on statuses (on page 65).



Parameters	Description
Display element	
Graphics	Clicking on Graphics opens the graphics selection dialog. Delete: Remove name from text line.
Specific settings	
Flashing	Active: Symbol flashes in runtime if status has been achieved.

Only screen symbol

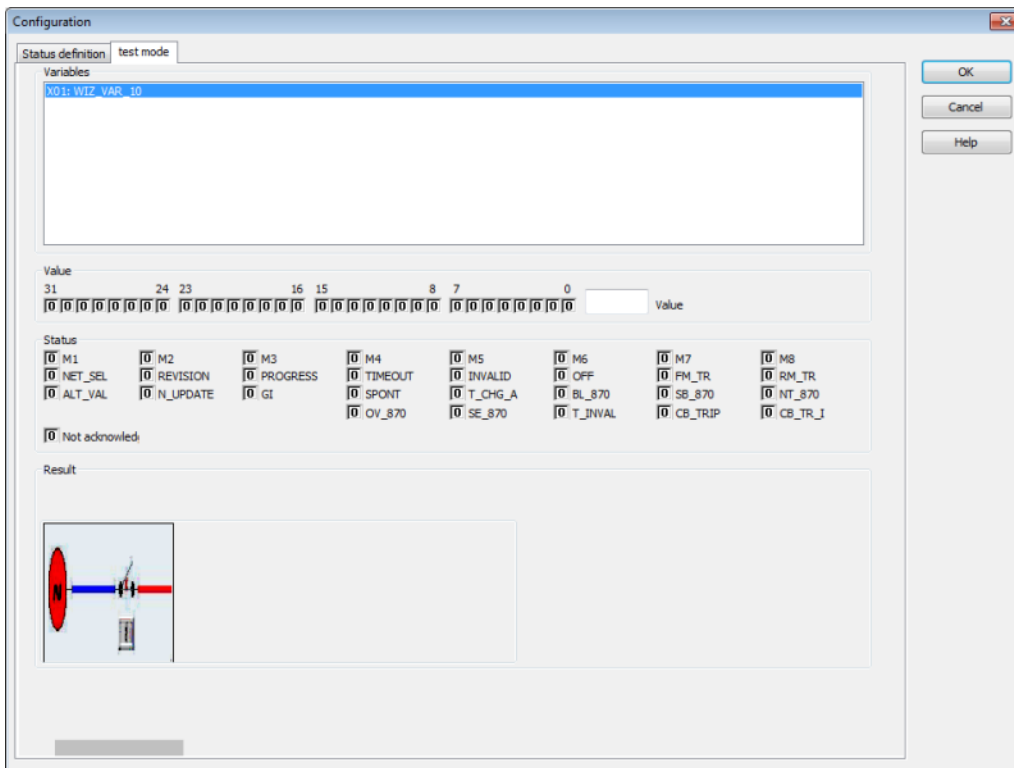
The general settings for all display types can be found in the chapter on statuses (on page 65).



Parameters	Description
Colors	
Color	Choice of color.
From ALC	The color of the linked source is used.
Specific settings	
Original Symbol Colors	Active: Transfers original color from symbol.
symbol transparent	Active: Symbol color is set to transparent.
Flashing	Active: Symbol flashes in runtime if status has been achieved.

10.7.4 Test mode

The test mode simulates the Runtime: You can test the change of a value and see how your Combined Element would behave during the Runtime. You can only activate this tab if all links refer to existing variables.



Note: In test mode, the symbol is displayed in a lower resolution than on the screen in Runtime .

10.7.5 Formula editor

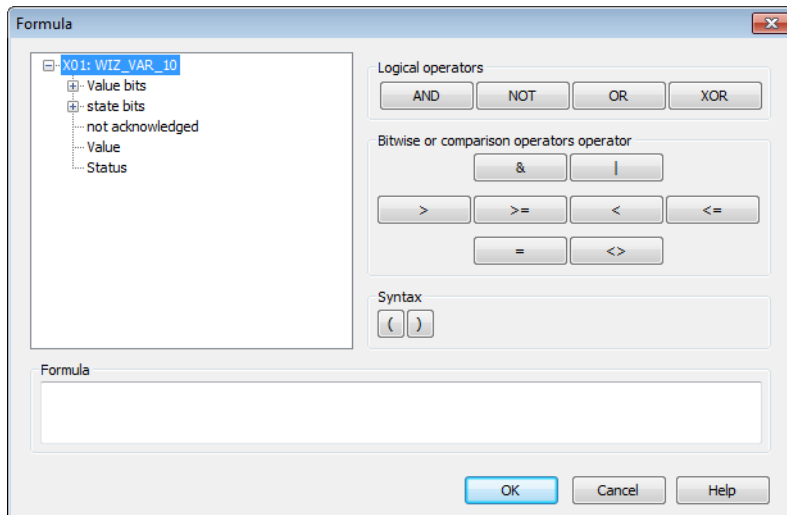
The formula editor provides support when creating formulas with logical or comparative operators with a combined element, for interlockings and commands. If additional variables are required for a formula, create these in the **formula variables** (on page 65) area of the status window by clicking on the **Add** button. existing formulas are displayed in the status list with the letters **F** .

Note on the input of decimal points:

- ▶ Decimal separator: Comma (,) is automatically converted into a dot (.):
- ▶ Zero as a decimal point is removed automatically; 23,000 automatically becomes 23

CREATING A FORMULA

Click on the **Formula** button in the status window. The formula editor opens.



You select the bits for your formula in the left screen.

On the right, you find the operators for logical and comparative operations.

The formula created is displayed in the **Formula** area.



Information

Up to 99 variables can be linked in one formula. X01 to X99. The length of the formula must not exceed 4096 characters.

THE MEANING OF THE BITS:

Parameters	Description
value bits	<p>32 value bits (from 0 -31) are available. They describe the variable value bit by bit. For binary variables, only bit 0 is of importance, for SINT and USINT only the bits from 0–7, etc.</p> <p>Note: The value refers to the raw value (signal range) of the variables and not to the converted measuring range.</p>
status bits	Here you find the most commonly used status bits. You find the exact definition and use of the status bits in the Status Bits List (on page 83).
not acknowledged	Not acknowledged is treated like a usual status bit. But here it is listed separately, because it does not belong to the classical variable statuses.
value and status	<p>All values (value bits and status bits) in the formula are considered as binary value and can be linked with logical operators such as AND or OR.</p> <p>The total value and overall status are an exception to this. In order to get a Boolean result this total value has to be ORed with a constant <code>bitwise</code> (on page 87). For this, we use the operator <code>&</code>.</p> <p>For the result 0 (false) of this logical ORing we get the binary value 0 (false), otherwise 1 (true).</p> <p>Example: see chapter Example bit by bit ORing (on page 87)</p>



Info

The status bits NORM and N_NORM are only available in the formula editor and cannot be engineered via the status.

If other settings outside the formula are set for the current status, they are combined with the formula with a logical AND.

Refer to the examples (on page 89) section for examples.



Information

Formulas with binary X values and bitwise linking can be used with a maximum of 2 binary values. If more values are required, the linking must be carried out without binary X values.

Example:

`X01.Value & X02.Value` -> works

`X01.Value & X02.Value & X03.Value` -> does not work

But:

`X01.00 AND X02.00 AND X03.00 AND X04.00 AND X05.00` -> works

List of status bits

Bit number	Short term	Long name	straton label
0	M1	User status 1	_VSB_ST_M1
1	M2	User status 2	_VSB_ST_M2
2	M3	User status 3	_VSB_ST_M3
3	M4	User status 4	_VSB_ST_M4
4	M5	User status 5	_VSB_ST_M5
5	M6	User status 6	_VSB_ST_M6
6	M7	User status 7	_VSB_ST_M7
7	M8	User status 8	_VSB_ST_M8
8	NET_SEL	Select in the network	_VSB_SELEC
9	REVISION	Revision	_VSB_REV
10	PROGRESS	In operation	_VSB_DIRECT
11	TIMEOUT	Runtime exceedance	_VSB_RTE
12	MAN_VAL	Manual value	_VSB_MVALUE
13	M14	User status 14	_VSB_ST_14
14	M15	User status 15	_VSB_ST_15
15	M16	User status 16	_VSB_ST_16
16	GI	General interrogation	_VSB_GR
17	SPONT	Spontaneous	_VSB_SPONT
18	INVALID	Invalid	_VSB_I_BIT
19	T_CHG_A	Daylight saving time/winter time announcement	_VSB_SUWI
20	OFF	Switched off	_VSB_N_UPD
21	T_EXTERN	Real time external	_VSB_RT_E
22	T_INTERN	Real time internal	_VSB_RT_I
23	N_SORTAB	Not sortable	_VSB_NSORT

24	FM_TR	Fault message transformer value	_VSB_DM_TR
25	RM_TR	Working message transformer value	_VSB_RM_TR
26	INFO	Information for the variable	_VSB_INFO
27	ALT_VAL	Substitute value If no value was transferred, the defined alternate value is used otherwise the last valid value is used.	_VSB_AVALUE
28	RES28	Reserved for internal use (alarm flashing)	_VSB_RES28
29	N_UPDATE	Not updated	_VSB_ACTUAL
30	T_STD	Standard time	_VSB_WINTER
31	RES31	Reserved for internal use (alarm flashing)	_VSB_RES31
32	COT0	Cause of transmission bit 1	_VSB_TCB0
33	COT1	Cause of transmission bit 2	_VSB_TCB1
34	COT2	Cause of transmission bit 3	_VSB_TCB2
35	COT3	Cause of transmission bit 4	_VSB_TCB3
36	COT4	Cause of transmission bit 5	_VSB_TCB4
37	COT5	Cause of transmission bit 6	_VSB_TCB5
38	N_CONF	Negative acceptance of Select by device (IEC60870 [P/N])	_VSB_PN_BIT
39	TEST	Test bit (IEC 60870 [T])	_VSB_T_BIT
40	WR_ACK	Writing acknowledged	_VSB_WR_ACK
41	WR_SUC	Writing successful	_VSB_WR_SUC
42	NORM	Normal status	_VSB_NORM
43	N_NORM	Deviation normal status	_VSB_ABNORM
44	BL_870	IEC 60870 Status: blocked	_VSB_BL_BIT
45	SB_870	IEC 60870 Status: substituted	_VSB_SP_BIT

46	NT_870	IEC 60870 Status: not topical	_VSB_NT_BIT
47	OV_870	IEC 60870 Status: overflow	_VSB_OV_BIT
48	SE_870	IEC 60870 Status: select	_VSB_SE_BIT
49	T_INVALID	Time invalid	not defined
50	CB_TRIP	Breaker tripping detected	not defined
51	CB_TR_I	Breaker tripping detection inactive	not defined
52	RES52	reserved	not defined
53	RES53	reserved	not defined
54	RES54	reserved	not defined
55	RES55	reserved	not defined
56	RES56	reserved	not defined
57	RES57	reserved	not defined
58	RES58	reserved	not defined
59	RES59	reserved	not defined
60	RES60	reserved	not defined
61	RES61	reserved	not defined
62	RES62	reserved	not defined
63	RES63	reserved	not defined



Information

In formulas all status bits are available. For other use the availability can be reduced.

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

Logical Operators

Logical links: Variables will only be checked for the logical value '0'; if the value does not equal '0', it will be considered as '1'.

In contrast to bit formulas, the technical range can be modified by a stretch factor -> (not equal '0' or '1').

Operator	Meaning
AND	logical 'AND'
NOT	Negation
OR	logical 'OR'
XOR	logical 'EXCLUSIVE OR'

The operators have the following priority in the formula calculation:

Priority	Operator
1	& (operator for bit formulas (on page 86))
2	NOT
3	AND
4	XOR/OR



Info

Up to 99 variables can be linked in one formula. X01 to X99.



Info

The status bits NORM and N_NORM are only available in the formula editor and cannot be engineered via the status.

Bit formulas

Bit formulas only have a logical high or low state. In contrast to logical formulas, the raw value is already predefined (0,1).

Operator	Description
&	AND
	OR

Example: ORing bitwise

You want to find out if one of the user status bits 1-8 (M1 ... M8) of the variable X01 is set.

USUAL FORMULA:

`X01.M1 OR X01.M2 OR X01.M3 OR X01.M4 OR X01.M5 OR X01.M6 OR X01.M7 OR X01.M8`

This query can be made much easier by the logical ORing of the overall status.

LOGICAL ORING:

`X01.Status & 0xFF`

The constant can be entered in hexadecimals, as described above:

`0xFF` corresponds to decimal 256; these are the first eight status bits (binary 11111111). If one of these bit is set to 1, the result of this bitwise ORing is 1 (true), otherwise it is 0 (false).

If, for example, all user status bits except the user status bit M7 should be queried, the binary statement for this would be: 10111111. Bit 7 is not of interest and is thus set to 0. This corresponds to 0xBF in hexadecimal. The expression for the formula is then: `X01.Status & 0xBF`.

Instead of ORing bitwise with a constant, the value can also be directly compared to a decimal number. If the comparison is wrong, the binary value is 0 (false) otherwise it is 1 (true).

Example:

You want to find out if the value is equal to the constant 202: The formula is:

`X01.value = 202`

If the value is equal to the constant 202, the result of the comparison is 1 (true) otherwise it is 0 (false).

Note: The bitwise ORing works with the OR character (|) in a similar manner to this example.

Comparison operators


Comparison operators serve for the direct comparison of two numeric values. The result of this comparison is a binary value. "0" if the condition is not fulfilled and „1“ if the condition is fulfilled.

Operator	Description
<	smaller
>	greater
<=	Less then or equal
>=	Greater than or equal
=	Equal
<>	unequal

To the left and to the right of the comparison operator, there has to be a (total) value or a (total) status, single bits cannot be used with these comparison operators.

There can also be a constant to the right of the comparison operator. (the constants can only be integers; a comparison to a floating point number is not possible.)

These constants are entered as hexadecimal values or decimal values in the combined element.

Hexadecimal figures are automatically converted to decimal values by clicking on  (for example, 0x64 is in decimal figures 100).



Example

X01.value >= X02.value

The result is 1, if the value of X01 is higher than or equal to the value of X02

X01.value = 0x64

The result is 1, if the value of X01 is exactly equal to the numeric value 100 (= hex 0x64)

(X01.value = 0x64) OR (X01.value = 0x65)

The result is 1, if the value of X01 is exactly equal to the numeric value 100 or 101 (= hex 0x64 and hex 0x65)

Examples for formulas

SIMPLE LOGICAL AND LINKING BETWEEN TWO BIT VALUES

Example

Formula: $X01.03 \text{ AND } X02.03$

This formula has the status TRUE, if both **bit 3** of variable 1 and **bit 3** of variable 2 both have the value 1.

COMPARISON OF AN ANALOGUE VALUE OR STATUS OF A VARIABLE

Example

$(X01.Value > X02.Value)$

COMPARE ANALOG VALUES WITH EACH OTHER ON A LOGICAL BASIS

Example

$(X01.Value > X02.Value) \text{ AND } (X01.Value = X02.Value)$

COMPARE WITH VALUE BITS AND STATUS BITS

Example

$(X01.Value > X02.Value) \text{ AND } (X01.Value = X02.Value) \text{ OR } (X01.03 = X02.03)$

COMPARE A VALUE WITH A DECIMAL OR HEXADECIMAL VALUE

Example

Formula: $(X01.Value = 111)$

Formula: $(X01.Value = 0x6F)$

If a hexadecimal values is used, this is later transferred to decimal by clicking on **OK**. If a decimal value is entered and confirmed, the value continues to be displayed as a decimal value after reopening.

**Info**

It is not possible to use a comma or a period when entering values.

10.7.6 Display of variable name, variable identification and measuring unit

You can display variable names and identifications with the the help of the combined element. Proceed in the following way:

1. Create a combined element.
2. As type of display, select `Status text & screen symbol`.
3. Create a default state.
4. Enter the following placeholder as status text.

Pay attention to capital letters and small letters when entering the data!

Placeholder	Description
<code>%n</code>	shows the variable name.
<code>%n,1,2</code>	shows the variable name starting at position 1 for 2 characters
<code>%N</code>	shows the variable name.
<code>%N,3,2</code>	Shows the variable name minus the first 3 and the last 2 characters.
<code>%l</code>	shows the variable identification.
<code>%l,1,2</code>	Shows the variable identification starting at position 1 for 2 characters
<code>%L</code>	shows the variable identification.
<code>%L.3.2</code>	Shows the variable identification minus the first 3 and the last 2 characters.
<code>%u</code>	Shows the measuring unit of the linked main variables.
<code>%u,1,2</code>	Shows the measuring unit starting at position 1 for 2 characters.
<code>%U</code>	Shows the measuring unit of the linked main variables.
<code>%U,3,2</code>	Shows the measuring unit minus the first 3 and the last 2 characters

10.8 Combo-/Listbox

You link values of variables with texts using the **Combo/List boxes** dynamic element. You use this in two ways:

1. If a text is selected in runtime, the value of the variable changes to the value that is linked to this text.
2. If the value reaches the value of the defined value, the linked text is displayed in the combo/list box with the current value.

CREATE A COMBO/LIST BOX

To create the **Combo/List box** dynamic element in a screen:

1. select the **Combo-/Listbox** symbol in the **Elements** tool bar
2. select the start point in the main window
3. pull open the element while pressing and holding the left mouse button
4. a Dialog (on page 254) opens in which you can link the desired variable to the element. Variables can also be linked to the element by Drag&Drop. Drag a variable onto a combo/list box and this then replaces the variables that were there before.

The following variable types are supported:

- Binary
- Numerical
- string



Info

No semicolon (;) can be displayed in the text for string variables, because the semicolon is used as a separator.

The combo/list box element supports the same additional functionalities as the numerical value (on page 202) element:

- Lock, Status, Visibility, Dynamic Colors.

- **Dynamic colors:** The background color is only accepted for existing entries. The part of the element that is not filled with entries is displayed in the standard background color.

Linking of macros to element events (such as LeftClickUp ...) is not supported.



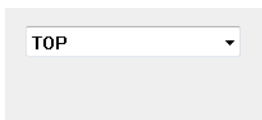
Attention

It is not possible to modify colors and fonts in the combo/list box under Windows CE.

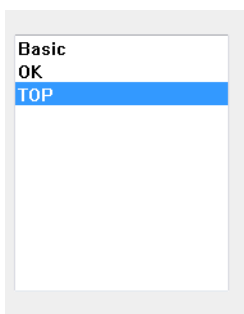
Comboboxes/listboxes can be created dynamically or statically. The ID_PROP_COMBOLIST_DYNCONTENT_USE property switches between static and dynamic operation. Fixed entries are defined in the Editor during static operation. In dynamic operation, a content variable is linked and its value is interpreted in Runtime.

DIFFERENCE BETWEEN COMBOBOX AND LIST BOX

The texts are opened individually in a window in the **Combo box**.



The values are displayed in a list and the current value is marked in the **List box**. If there are more statuses than can be displayed in the list, a scroll bar is displayed.



Info

If the variable has a value which has not been defined in the combo box/list box entries, no text is displayed or marked.

STATIC COMBOBOX OR LIST BOX

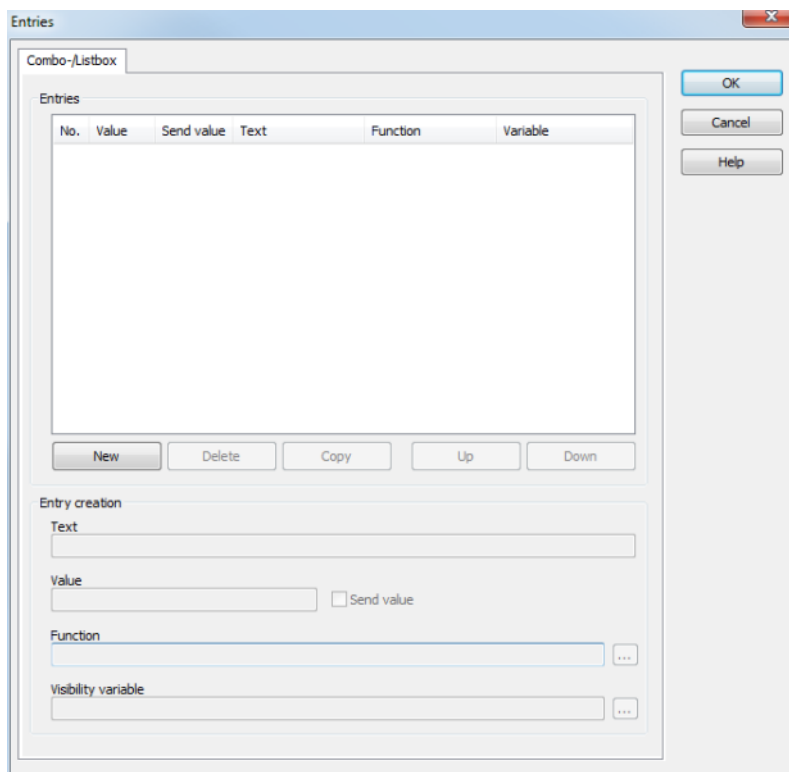
Fixed entries are configured in the Editor for a static box. These are displayed and used in Runtime.

To enter values:

1. Open the **Representation** group.
2. Select the display type using the **Type** property: **Combobox** or **List box**.

Default value **Listbox**

3. Deactivate the **Entries from string variable** property
4. Click on the **...** button in the **Entries** property
5. The dialog for configuration of the entries is opened



6. enter the values for statuses
7. Link the values with the texts for statuses

ENTRIES DIALOG

Entries

Combo-/Listbox

Entries

No.	Value	Send value	Text	Function	Variable
0	1	yes		Function 0	WIZ_VAR_10
1		yes	Text	Function 23	InternalVarFromWiz...

New

Delete

Copy

Up

Down

Entry creation

Text

Text

Value

☒ Send value

Function

Function 23

...

Visibility variable

InternalVarFromWizard_1

...

OK

Cancel

Help

Parameters	Description
Entries	List of entries already defined.
no.	Consecutive number, is assigned automatically.
Value	Value that was assigned under Entries/Value .
Send value	Yes: Send value is active. No: Send value is inactive.
Text	Character string that was entered into Entries/Text .
Function	Function that was linked to the Entries/Function field.
Variable	Linked visibility variable.
New	Creates a new entry with: <ul style="list-style-type: none"> ▶ consecutive number ▶ Set active value
Delete	Removes the selected entry. Only one entry can be removed; it is not possible to select several entries.
Copy	Copies selected element and adds it at the end of the list as new element. The settings of the copied elements are taken over.
Upwards/downwards	Moves the selected entry upwards or downwards and adapts the consecutive numbering to suit.
Entry setting	Configuration of entries in the list.
Text	Entry of the character string which is linked to the value.
Value	Numerical value. The values that can be entered depends on the data type of the variables.
Send value	activates or deactivates set value: Active: The value is set as a set value. Inactive: The value entered only serves to index the selection. Attention: Set value only affects the value, not the function. The function is always sent. Set value must be inactive for a function call without linked variable.

Function	Function that is executed when the entry is selected in Runtime. Click on the . . . button to open the dialog for selecting a function (on page 253). Attention: The function is only executed if you select the entry via the combo box/list box during runtime. If the triggering value changes and reaches the level of the variable, the function is not executed. Set value must be inactive for a function call without linked variable.
Visibility variable	Variables for which the value changes and thus limit violations can be evaluated in Runtime. If there is a limit breach of the visibility variables, the Visibility property is evaluated by this limit breach. It determines if the entry is visible in the list or not. The entry is displayed in the list as standard (there is no limit breach). Click on the . . . button to open the dialog for selecting a variable (on page 254). Attention: A value change during operation can lead to, with comboboxes, an open combobox being closed.
OK	Applies settings and closes the dialog.
Cancel	Discards changes and closes the dialog.
Help	Opens online help.

SORTING ENTRIES

The entries can be sorted using:

- **Upwards** and **Downwards** buttons: Highlight the desired element and move it with the buttons.
- **Drag & drop:** Drag the element to the desired place with the mouse. A red line displays the point where the element is inserted.

DYNAMIC COMBOBOX OR LIST BOX

For dynamic operation, a string variable that defines the content must be linked using the `Variable` property. Any static entries that may be configured at the same time in Runtime are ignored. The value of the content variable is evaluated and interpreted. To do this, the value of the variables must correspond to a valid layout in Runtime.

LAYOUT

The string value displays a list of entries. Each entry consists of a value and a text that is separated with a comma ",". Entries are concluded with a semi-colon ";". If the text part of an entry contains an "@" character, the text part is translated with the help of the existing language table.

Example of a valid string value:

```
1,one;2,two;3,three;
```

Example of a valid string value with translation:

```
1,@one;2,@two;3,@three;
```

CONFIGURATION

To link a variable:

1. Open the `Representation` group.
2. Select the display type using the `Type` property: `Combobox` or `List box`.
Default value `Listbox`
3. Activate the `propertyEntries` from string variable
4. Select, using the `Variable` property, the desired variable
(clicking on the ... button opens the dialog for variable selection (on page 254))
5. Select the string variable with the configured entries

MARK ELEMENT IN LIST WHEN SELECTED

The elements displayed in the combo box or list box can be marked in color in runtime. To do this:

- ▶ navigate to `Group Color` in properties
- ▶ select `Properties` in the group `Colors static`
 - `Text color when selected` for the text color
 - `Background color for selected entry` for the text background color

These colors are then used during runtime. Operating system settings are ignored, as are the colors of linked variables.



Information

The colors of the operating system were used up to version 6.50. When converting the project:

- ▶ the background color is set to that configured in the operating system
- ▶ if the text color is set as a statically defined color

On computers where the colors have been changed in the operating system, this may lead to different behavior during runtime.

TROUBLESHOOTING

Errors are displayed as log entries in the Diagnosis Server:

Message	Level	Meaning
The value '%s' of the content variable '%s' is not valid, entries might be incorrect or missing!	Errors	<p>The string variable linked in the <code>Variable</code> property has a value with invalid layout.</p> <p>The text is evaluated as far as possible. The current value is also logged to make error analysis in Runtime easier.</p>

10.9 Dynamic Text

With the **Dynamic Text** dynamic element, you display the current limit value text in the event of the limit being breached or display the value of a string variable in alphanumeric form. If there is no limit violation, the text defined in the Editor is displayed.

To create a **dynamic text** in a screen:

1. Select the **Dynamic text** symbol in the **Elements** tool bar
2. select the start point in the main window
3. pull open the element while pressing and holding the left mouse button
4. the dialog to assign a variable (on page 254) opens
5. select the variable you want to assign

6. Define the desired properties in the properties window

10.10 Ellipse

To draw an ellipse:

1. select the `Ellipse/Circle` symbol in the **Elements** tool bar or in the **Elements** drop-down list
2. select the start point in the main window
3. pull open the ellipse while pressing and holding the left mouse button
4. The shape, size and position can be changed at any time by pulling the vertexes or moving the element
5. if you press and hold `alt` while pulling the outer corner points, the change is carried out symmetrically
6. define the desired properties in the **properties window**

10.11 Circle

In order to draw a circle:

1. Select the `Ellipse/Circle` symbol in the **Elements** tool bar
2. select the start point in the main window
3. hold down the `shift` key
4. pull open the circle while pressing and holding the left mouse button
5. The shape, size and position can be changed at any time by pulling the vertexes or moving the element
6. if you press and hold `alt` while pulling the outer corner points, the change is carried out symmetrically
7. if you want the circle to retain its shape press and hold `Shift` while pulling

8. define the desired properties in the **Properties** window

10.12 Arc of a circle

In order to draw an arc of a circle:

- ▶ Select the **Arc of a circle** symbol in the **Elements** toolbar
- ▶ select the start point in the main window
- ▶ pull open the arc of the circle while pressing and holding the left mouse button
- ▶ pulling upwards to the right opens the arc of the circle to the left; all directions work along the same lines
- ▶ to change the opening direction, move a central touch point over the opposite line
- ▶ The shape, size and position can be changed at any time by pulling the vertexes or moving the element
- ▶ if you press and hold **alt** while pulling the outer corner points, the change is carried out symmetrically
- ▶ hold down the **shift** key whilst moving it and the aspect ratio is maintained
- ▶ define the desired properties in the **properties** window



Info

The arc of the circle is always displayed as a quadrant and can be extended by copying and pasting.

Filling patterns and fill colors are not available for arcs of circles.

10.13 Segment of a circle



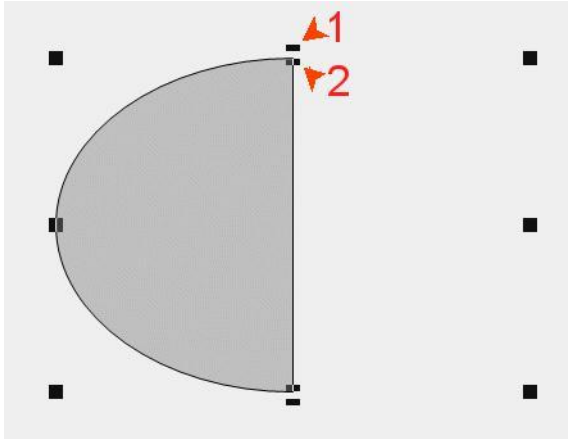
Attention

With the segment of a circle, you draw the desired part of a circle or ellipse.

To draw a segment of a circle:

1. Select the `Segment of a circle` symbol in the `ELEMENTS` tool bar
 2. select the start point in the main window
 3. pull on the segment of the circle pressing and holding the left mouse button
 4. pulling upwards to the right opens the segment to the left and vice versa
 5. to change the opening direction, move a central touch point over the opposite line
 6. The shape, size and position can be changed at any time by pulling the vertexes or moving the element
 7. if you press and hold `Alt` while pulling the outer corner points, the change is carried out symmetrically
 8. hold down the `shift` key whilst moving it and the aspect ratio is maintained
 9. you have two possibilities to change the opening angle or to open the circle segment upwards or downwards:
 - move the mouse over one of the two divided touch points until the mouse pointer on the outermost of the two points turns into a black cross with arrows and move the point into the desired direction
or
 - Change the angle settings properties under `Opening angle`. For example:
 - for opening downwards: `End angle [°] 180°` and `Start angle [°]` to `0°`
 - for opening downwards:
- Angle data can have a maximum of two decimal points.
- Note:** Because the corner points calculated from angle data are pixels, and these must be whole numbers, it can be the case that the angle display deviates from the data somewhat. For example 45° does not give whole number of pixels. It is rounded off internally in zenon and the the angle is displayed as 44.75° .

10. define the desired properties in the Properties window



Key:

1) touch points for opening angle

2) touch point for height



Info

If you would like to use the segment of a circle as an arc of a circle, change the `Filling pattern` property to the value of transparent. Only the outer line is displayed with the transparent display type.

The opening angle must always be $> 0^\circ$ and $< 360^\circ$.

Attention

The Segment of a circle element is not available in Windows CE.

SEGMENT THICKNESS

The segment thickness of the segment of a circle can be defined with the help of properties from the `Segment thickness` group. If the `Adjustable segment thickness` property is activated, then the ellipsis at the start and end angle of the outer edge to the center only displays the thickness set. Thus hose-like forms with different start thicknesses and end thicknesses can be displayed in a curved form.

Both circle-shaped and elliptical segments are supported. The `End thickness equals start thickness` property is available to display forms with the same thickness.

If 0 is defined as the segment thickness for `Thick start angles [pixel]` and `Thickness end angles [pixel]`, then an arc of a circle is displayed.

Note on availability: Not available for `Graphics quality Windows Basis`, for `Windows CE project aktiv` or for `Color gradient With brightness values`.

10.14 Line

To draw a line:

1. Select the `Line` symbol in the **Elements** tool bar
2. select the start point in the main window
3. pull out the line while pressing and holding the left mouse button
4. The shape, size and position can be changed at any time by pulling the vertexes or moving the element
5. if you press and hold `alt` while pulling the outer corner points, the change is carried out symmetrically
6. define the desired properties in the **properties window**



Info

Filling patterns and fill colors are not available for lines.

10.15 Message element

With the **Message Element** dynamic element, you can show text in runtime depending on the statuses of process variables. The source for texts are ASCII text files, made up as tables. You can configure these freely.

To create the **Message Element** in a screen:

1. select the **Message element** symbol in the **Elements** tool bar

2. select the start point in the main window
3. pull open the element while pressing and holding the left mouse button
4. the dialog to Assign a variable (on page 254) opens
5. select the desired variables
6. Define the desired properties in the properties window

CONSTRUCTION OF THE TABLE

- ▶ Create an **ASCII** text document
- ▶ you must save it in **Unicode** format
- ▶ use the character | (ASCII-Code 124) as a column separator
- ▶ Example:
 - 1 | Off | On | Diff | Fault
 - 2 |Off | On | True | False
 - 4 | Text1 | Text2 | Text3 | Text4
- ▶ the linked variables define lines and columns of the text to be shown

FIRST VARIABLE

The first variable in the list must be a word variable and defines the column position from which the text is taken. At the same time, it controls the type of processing.

bit set	effect
Bit 15 (bit with the highest value)	Message element blocked; nothing is displayed any more.
Bit 14	Update of the screen output switched off; last active text is displayed.

Note: For a 16-bit variable a maximum of 14 columns is possible. The addressing of the column takes place via the bit number and not via the numerical value.

SECOND AND FURTHER VARIABLES

The other variables define the line position from which the text is taken. The significance arises from

Value	Row
1	Line 1
2	Line 2
4	Line 3

Each line variable is responsible for a maximum of 16 lines. If more than 16 lines are needed, further line variables can be defined.

If line 1 and line 2 are to be displayed alternately, the significance of the line variable must be 3. If all 16 bits are set, lines 1 to line 16 are displayed alternately.

10.16 Multibin

You can define several elements with the **Multibin** dynamic element:

- ▶ display graphics depending on variable values
- ▶ Color symbols
- ▶ Issue status text
- ▶ link numerical values and binary values
- ▶ display a switch or key for the first variable, provided the first variable is a binary variable

CREATE THE MULTI BINARY ELEMENT

To create a **multi-binary** in a screen:

1. Select the **Multibin** symbol in the **Elements** tool bar
2. select the start point in the main window
3. pull open the element while pressing and holding the left mouse button
4. the dialog to Assign a variable (on page 254) opens
5. select the desired variables

6. Define the desired properties in the properties window

DEFINE STATUSES

You define the settings for variable statuses to be displayed in the dialog to enter elements:

1. click on the `Representation` node
2. on the `Configuration` property
3. the dialog for status definition (on page 106) opens
4. defined statuses are processed from top to bottom
5. The settings for the first applicable status are displayed

Other topics in this chapter

Graphics.....	107
Screen symbol/status text.....	109
Switch settings	111

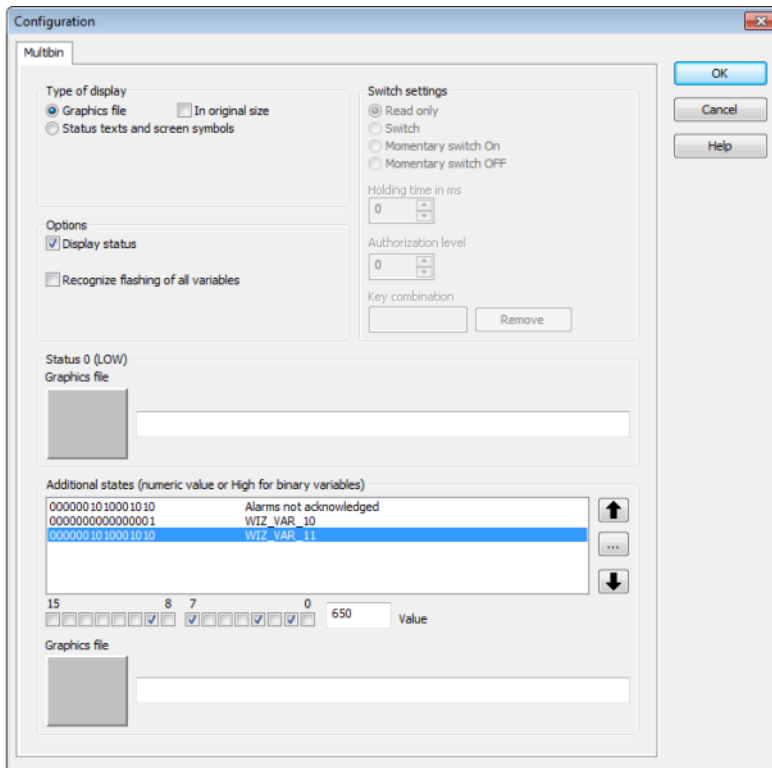
10.16.1 Multi-binary element

To assign the `multi binary element` to certain statuses:

1. click on the `Representation` node
2. on the `Configuration` property
3. the dialog for inputting elements (on page 106) opens
4. select the desired display type:
 - Graphics: Representation of the information in pixel graphics files; this also enables moved screens
 - Screen symbol/status text: Display of symbols and text information
5. Defined statuses processed from top to bottom and the setting for the first applicable status are displayed.

Graphics

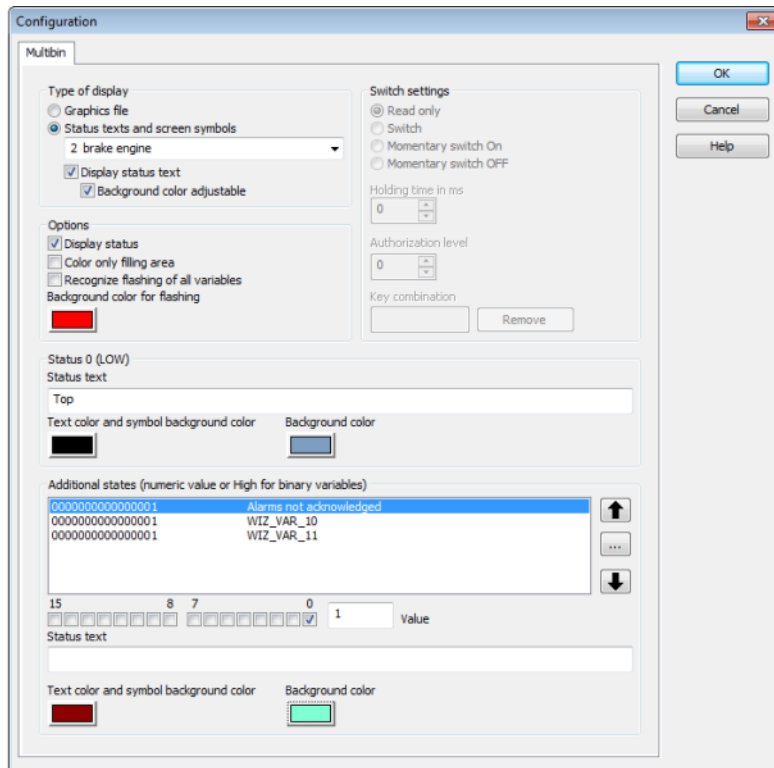
Display of information in pixel graphics files; this also enables moved screens.



Property	Description
In original size	<p>Active: Graphics are displayed in original size.</p> <p>Inactive: Graphics are stretched or compressed to the display size.</p>
Options	
Display status	Highlights the element in runtime with a red dot at exception status.
Recognize flashing of all variables	Active: Sum alarming of all linked process variables. The graphics or color are determined by the current status. Active flashing states remain kept until quitting.
Status 0 (LOW)	Settings for the current status in line with display type.
Graphics	<p>Selection of graphics. A click on the ... button opens the file selection dialog.</p> <ul style="list-style-type: none"> ▶ To select a file from a project, this must already be present in the Files/graphics node in the project manager. ▶ to select a file directly from any desired folder on the computer, the Direct file selection property must be activated.
Further statuses	<p>Select further variables (on page 254) via the . . . button and sorting of statuses via the Upwards and Downwards buttons.</p> <p>For each of the linked variables, there must be a discrete status defined; this is defined by entering the values for multibit information and numerical values. Multibit values must be assigned several times: Number of statuses minus 1; example double message=3.</p> <p>If a discrete state has occurred, it is displayed. If none of the indicated values is present, the status 0 [LOW], globally valid for the element, is displayed.</p> <p>Note: For non-binary variables, the value is entered in the signal resolution.</p>

Screen symbol/status text

Display of symbols and text information. The color of the current status is given at the same time.

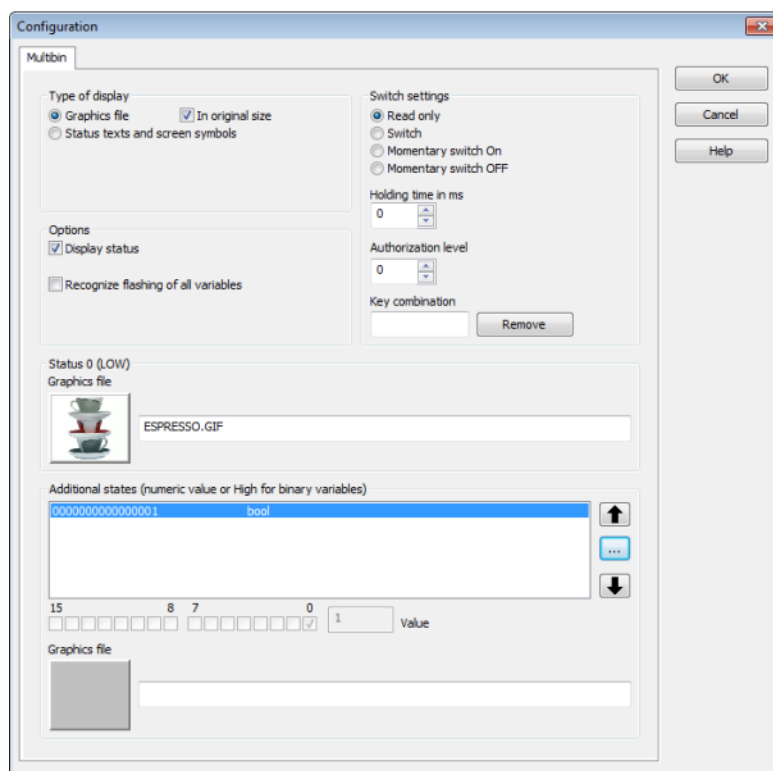


Property	Description
Screen symbol/ status text	Select a symbol. The symbol must already be present on the screen The symbol shown in the drop-down list flashes on the screen until the Enter element dialog is ended.
Display status text	Active: Status texts are displayed in runtime.
Background color can be set	Active: The background color for the text can be freely chosen.
Options	
Display status	Highlights the element in runtime with a red dot at exception status.
Only color the filling color	only the filling area of the static elements is colored, the border stays the same
Recognize flashing of all variables	Active: Sum alarming of all linked process variables. The graphics or color are determined by the current status. Active flashing states remain kept until quitting.
Background color when flashing	Background color when flashing
Status 0 (Low)	
Status text	Text that it is displayed in runtime. Input is only possible if the Display status text property is active.
Symbol color/text color	Select the color for the symbol and status text.
Text background color	Selection of the background color for the status text. Only available if the configurable background property is active.
Further statuses	<p>Select further variables (on page 254) via the . . . button and sorting of statuses via the Upwards and Downwards buttons.</p> <p>For each of the linked variables, there must be a discrete status defined; this is defined by entering the values for multibit information and numerical values. Multibit values must be assigned several times: Number of statuses minus 1; example double message=3.</p> <p>If a discrete state has occurred, it is displayed. If none of the indicated values is present, the status 0 [LOW], globally valid for the element, is displayed.</p>

Note: For non-binary variables, the value is entered in the signal resolution.

Switch settings

If a binary variable is linked as the first variable, this can be used as a switch or momentary switch.



Property	Description
Read only	It is not possible to input setpoints in runtime.
Switch	Element acts as a switch for setpoint input.
Momentary switch On	Writes setpoint HIGH. The preferred position for the switch goes to off .
Momentary switch OFF	Writes setpoint LOW. The preferred position for the switch goes to on .
Holding time in ms	Holding time of target state
Authorization groups	Defines the necessary authorization level for set value element.
Key combination	Key combination for set value input

10.17 Polygon

To draw a polygon:

1. Select the **Polygon** symbol in the **ELEMENTS** toolbar
2. In the main window, select the start point by clicking the left mouse button
3. pull the first section
4. place an initial corner point with a simple mouse click (left)
5. draw another line and place the corner points
6. set the end point by double clicking or pressing the escape key
7. The shape, size and position can be changed at any time by pulling the vertexes or moving the element
8. hold down the **shift** key when pulling; this way, only horizontal or vertical movements away from the original position are possible
9. define the desired properties in the Properties window

Hint: You define the rounding (on page 206) of the lines with the **Rounding** property. To do this, select a value between 0 (no rounding) and 1 (maximum rounding).

ADDING CORNERS:

To add corners (corner points):

- ▶ move the mouse cursor to a line of the polygon:
- ▶ right-click
- ▶ select menu item **Adding a node in the selected element** from the context menu

or:

- ▶ press **Ctrl** and **Shift** simultaneously
- ▶ move the mouse cursor to a line of the polygon:
- ▶ the mouse cursor changes to an arrow with a plus-symbol
- ▶ left-click in order to add a corner

REMOVING CORNERS:

- ▶ move the mouse cursor to a corner of the polygon:
- ▶ right-click
- ▶ select menu item **Deleting the node in the selected element** from the context menu

or:

- ▶ press **Ctrl** and **Shift** simultaneously
- ▶ move the mouse cursor to a corner of the polygon:
- ▶ the mouse cursor changes to an arrow with a plus-symbol
- ▶ left-click to delete the corner



Information

The `With brightness values` property is not available for polygons.

10.18 Polyline

To draw a polyline:

1. Select the `Polyline` symbol in the **E**lements toolbar
2. In the main window, select the start point by clicking the left mouse button
3. pull the first section
4. place an initial corner point with a simple mouse click (left)
5. draw another line and place the corner points
6. set the end point by double clicking or pressing the escape key
7. The shape, size and position can be changed at any time by pulling the vertexes or moving the element
8. hold down the `shift` key when pulling; this way, only horizontal or vertical movements away from the original position are possible
9. define the desired properties in the Properties window

Hint: You define the rounding (on page 206) of the lines with the `Rounding` property. To do this, select a value between 0 (no rounding) and 1.

ADDING CORNERS:

To add corners (corner points):

- ▶ move the mouse cursor to a line of the polygon:
- ▶ right-click
- ▶ select menu item **A**dding a node in the selected element from the context menu

or:

- ▶ press `Ctrl` and `Shift` simultaneously
- ▶ move the mouse cursor to a line of the polygon:
- ▶ the mouse cursor changes to an arrow with a plus-symbol

- ▶ left-click in order to add a corner

REMOVING CORNERS:

- ▶ move the mouse cursor to a corner of the polygon:
- ▶ right-click
- ▶ select menu item **Deleting the node in the selected element** from the context menu

or:

- ▶ press **Ctrl** and **Shift** simultaneously
- ▶ move the mouse cursor to a corner of the polygon:
- ▶ the mouse cursor changes to an arrow with a plus-symbol
- ▶ left-click to delete the corner



Attention

*If you shape a polyline to a polygon and the **Invert background** option is active, the sizing handles for the start and end of the line are invisible when overlapping. You deactivate this option at **Options -> Settings -> Corner points - Invert background**.*

10.19 Rectangle

To draw a rectangle:

1. Select the **Rectangle** symbol in the **Elements** tool bar
2. select the start point in the main window
3. drag the rectangle while pressing and holding the left mouse button

4. The shape, size and position can be changed at any time by pulling the vertexes or moving the element
5. if you press and hold `alt` while pulling the outer corner points, the change is carried out symmetrically
6. define the desired properties in the **properties window**

Hint: You can round (on page 206) the corners at will in order to create a rectangle with rounded corners

10.20 Square

In order to draw a square:

1. Select the **Rectangle** symbol in the **Elements** tool bar
2. hold down the `shift` key
3. select the start point in the main window
4. pull open the square while pressing and holding the left mouse button
5. The shape, size and position can be changed at any time by pulling on the corner points or moving the element;
if the 'square' shape is to be retained hold down the `shift` key whilst pulling on the corner points
6. if you press and hold `alt` while pulling the outer corner points, the change is carried out symmetrically
7. define the desired properties in the **properties window**

10.21 Pipe

To draw a tube:

1. select the **Pipe** symbol in the **Elements** tool bar
2. In the main window, select the start point by clicking the left mouse button

3. pull the first section
4. place an initial corner point with a simple mouse click (left)
5. draw another line and place the corner points
6. set the end point by double clicking or pressing the `esc` key
7. The shape, size and position can be changed at any time by pulling the vertexes or moving the element
8. hold down the `shift` key when pulling; this way, only horizontal or vertical movements away from the original position are possible
9. define the desired properties in the Properties window

Hint: You define the rounding (on page 206) of the lines with the `Rounding` property. To do this, select a value between 0 (no rounding) and 1 (maximum rounding).

ADDING CORNERS:

To add corners (corner points):

- ▶ move the mouse cursor to a line of the polygon:
- ▶ right-click
- ▶ select menu item **Adding a node in the selected element** from the context menu

or:

- ▶ press `Ctrl` and `Shift` simultaneously
- ▶ move the mouse cursor to a line of the polygon:
- ▶ the mouse cursor changes to an arrow with a plus-symbol
- ▶ left-click in order to add a corner

REMOVING CORNERS:

- ▶ move the mouse cursor to a corner of the polygon:
- ▶ right-click
- ▶ select menu item **Deleting the node in the selected element** from the context menu

or:

- ▶ press `Ctrl` and `Shift` simultaneously
- ▶ move the mouse cursor to a corner of the polygon:
- ▶ the mouse cursor changes to an arrow with a plus-symbol
- ▶ left-click to delete the corner

10.22 Switch

You show the value of a binary variable in graphic form and modify it with the **Switch** dynamic element. The element can also be used as a switch for one-stage unsecured command.

To create **Switch** in a screen:

- ▶ Select the **Switch** symbol in the **Elements** toolbar
- ▶ select the start point in the main window
- ▶ pull open the element while pressing and holding the left mouse button
- ▶ the dialog to select a binary variable (on page 254) opens
- ▶ select the variable you want to assign
- ▶ define the desired properties in the properties window

To use the element as a switch, activate the `Momentary switch` property in the `Write set value` node

10.23 Static text

To enter statistical text:

1. select the `Statistical Text` symbol in the **Elements** tool bar
2. select the start point in the main window

3. pull the text field open while pressing and holding the left mouse button
4. The shape, size and position can be changed at any time by pulling the vertexes or moving the element
5. if you press and hold the alt key while pulling the outer corner points, the change is carried out symmetrically
6. define the desired properties in the Properties window

To enter text:

1. click on the text field with a delayed double click
or: select Edit in the context menu
2. write the desired text



Information

The text is automatically wrapped as standard, depending on the size of the text field. To turn off the wrapping, deactivate the property `Automatic word wrap` in the `Representation` node.

***Hint:** If a `Text angle [°]` (`Representation`) is defined in the property, it is not possible to wrap the text. An angle display with text wrapping can also be achieved by rotating the whole element (including the frame lines, if activated).*

UNDERLINE

To underline text, place a & in front of the text to be underlined.

&Text becomes:

Text

If you would like to use the character '&' in text, enter it twice:

1 && 2 becomes 1 & 2.

LINE BREAK

To define a line break, use the string `\n`.

Example:

Line 1 \n

Line 2



Information

Input is no longer limited to 80 characters from version 6.51 onwards.

10.24 Move symbol (up to version 6.22 only)

With the **Move Symbol** dynamic element, you can move elements you wish to move horizontally or vertically or change their size (zoom) regardless of the status of other variables. To do this, connect the elements to a symbol.

To create **Move Symbol** in a screen:

- ▶ select the **Move Symbol** symbol in the **Elements** tool bar
- ▶ select the start point in the main window
- ▶ pull open the element while pressing and holding the left mouse button
- ▶ select the desired variable and define the desired properties in the properties window
- ▶ You can only use symbols that are already in the screen

The **Move Symbol** dynamic element is available up to version 6.22. From version 6.50, use dynamic properties of an element such as **Position**, **Size** and **rotation dynamic** or **Color** for all dynamic actions.

10.25 Trend Element

With the **Trend Element** dynamic element, you display all values in runtime in the form of trend curves, where several process variables can be displayed at the same time.

In order for the **Trend Element** to display values, the **Harddisk data storage active** property in the **Harddisk data storage node of variable properties** must be active. **Cycle time [s]** and

Number of values must correspond to the Update time and the Period of representation in the **trend element**, otherwise the drawing of the curve is restarted every time the screen is called up. Each change can have an effect on other **Trend Elements** that use the same process variables.

CREATE A TREND ELEMENT

To create a **Trend Element** in a screen:

1. select the **Trend Element** symbol in the **Elements** tool bar or in the **Elements** drop-down list
2. select the start point in the main window
3. pull open the element while pressing and holding the left mouse button
4. the dialog to assign several numeric variables (on page 254) opens
5. select the desired variables
6. all curves are automatically created in the **Trend Element**

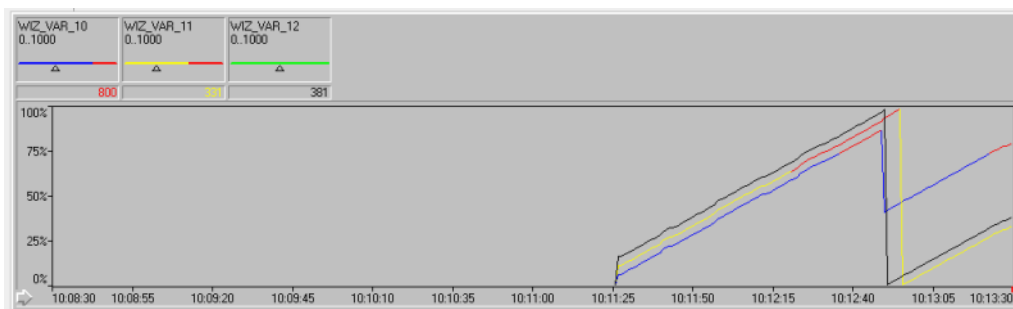
To add a curve later:

- In properties, select the {Curve new} property in the **Curves** node

or:

- drag the desired variable onto the **Trend-Element** while holding the left mouse button

7. Define the desired properties in the properties window
 - You define Graphic properties of the curves in the **Curves** node of properties
 - You determine cycle time and number of values in the properties of the respective variable in the **Harddisk data storage** node





Information

Functions and variables can also be linked to the Element by Drag&Drop.

10.26 Clock

With the `clock` dynamic element, you show the current time in Runtime or you convert numerical values into a time. The date/and or the time can be displayed as an absolute time period or a time difference.

ADVERTISEMENT

The display in Runtime depends on whether a variable was linked.

- ▶ If no variable is linked to the element, the current system time is displayed in absolute time in Runtime.
To do this, set, in the `Representation` group, the `Type of display` property to the value `System time/absolute time`.
- ▶ If a variable is linked, then its value can be displayed as:
 - `Time difference`: The variable must contain the number of seconds.
The integer values in the seconds area `-2147483648 (min(DINT))` to `+4294967295 (max(UDINT))` can be displayed.
It is also possible to display negative values: A variable value of `-60` is displayed in `mm:ss` format as `-01:00`. Thus if `-01:40` is this displayed, the resulting variable value is `-100`.
 - `Absolute time period`: The Unix time - the seconds passed since January 1, 1970 00:00 UTC in the positive range.

Only positive values up to `2147483647` can be displayed. A variable value outside this area leads to an incorrect display: The `hh:mm` part remains `00:00` or `01:00` in winter time.

ENGINEERING

To create a `clock` in a screen:

1. select the `clock` symbol in the **E**lements tool bar or in the **E**lements drop-down list
2. select the start point in the main window
3. pull open the element while pressing and holding the left mouse button
4. If a variable is to be linked, then:
Link the desired variable in the `Variable / function` section or by dragging & dropping the element
 - All variables can be linked, with the exception of string and Boolean variables
 - Fractions of float variables (from data types `REAL` and `DATA_AND_TIME` for example) are not taken into account.
5. Define the desired properties in the properties window, most of all:
6. Select the `Type of display` property in the `Representation` group
 - `System time/absolute time period` The time is displayed as an absolute time.
Note: Context menu and tooltip are not supported.
 - `Time difference`: The time difference is given in minutes and seconds The linked variable must contain the number of seconds.
The integer values in the seconds area `-2147483648 (min(DINT))` to `+4294967295 (max(UDINT))` can be displayed. It is therefore also possible to display negative values.
Examples in `mm:ss` format: The variable value 50 is displayed as `00:50`, the variable value 100 is displayed as `01:40`.
The variable value -60 is displayed as `-01:00`. Thus if `-01:40` is this displayed, the resulting variable value is -100.
7. Select the desired display using the `Formating` property



Information

With absolute time period with the Write set value via element, the input field has time difference formatting.

For example:

- ▶ Formatting of the absolute time period `hh:mm:ss dd.mm.yy` is displayed in the element as: `dd:hh:mm:ss`
- ▶ `dd.mm.yyyy` (for example 17.12.2008) as `dddddd` (14230 days since 1. 1. 1970).

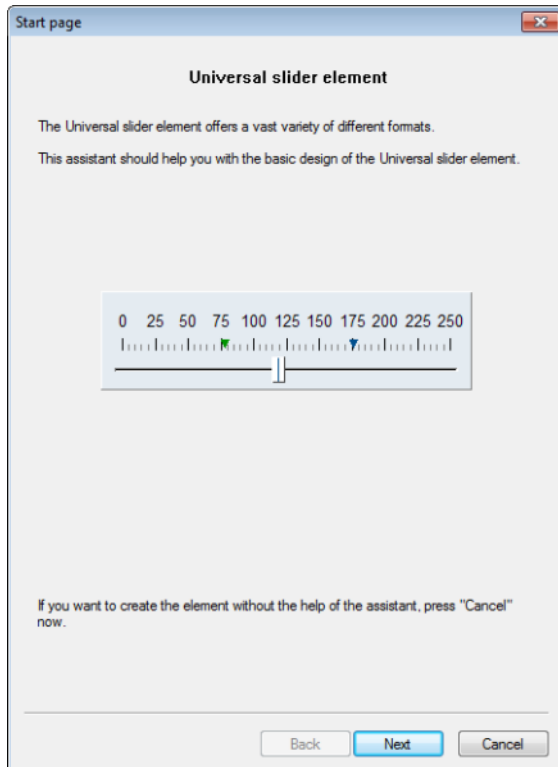
10.27 Universal slider

With the **Universal slider** element, you show variables in the form of sliders, bar graphs, LED bar displays or any other sliders you wish. The sliders allow set value elements to be set in runtime.

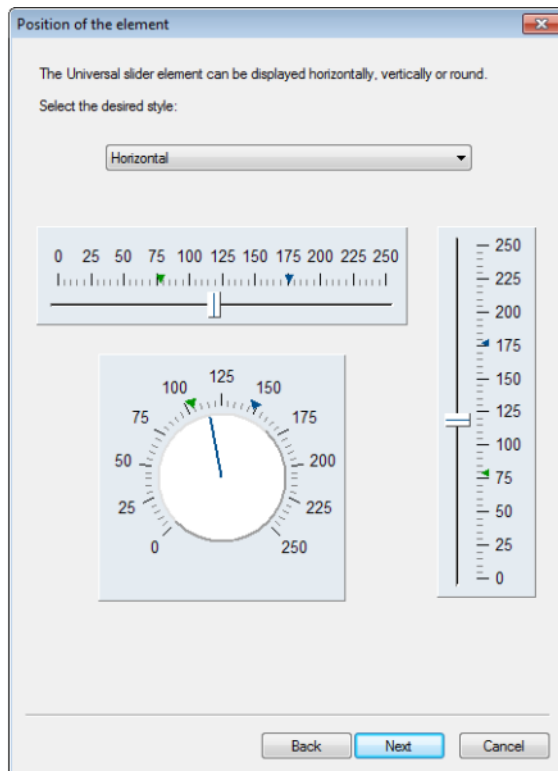
To create the **universal slider** in a screen:

1. select the **Universal slider** symbol in the **Elements** tool bar or in the **Elements** drop-down list
2. select the start point in the main window
3. pull open the element while pressing and holding the left mouse button
4. the dialog to assign a variable (on page 254) opens
5. select the variable you want to assign

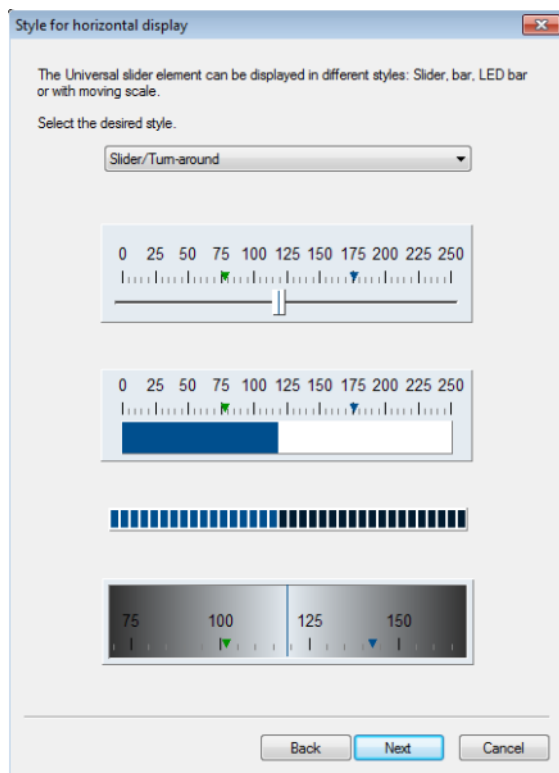
6. the universal slider configuration assistant opens



7. select the alignment:
horizontal, vertical or round

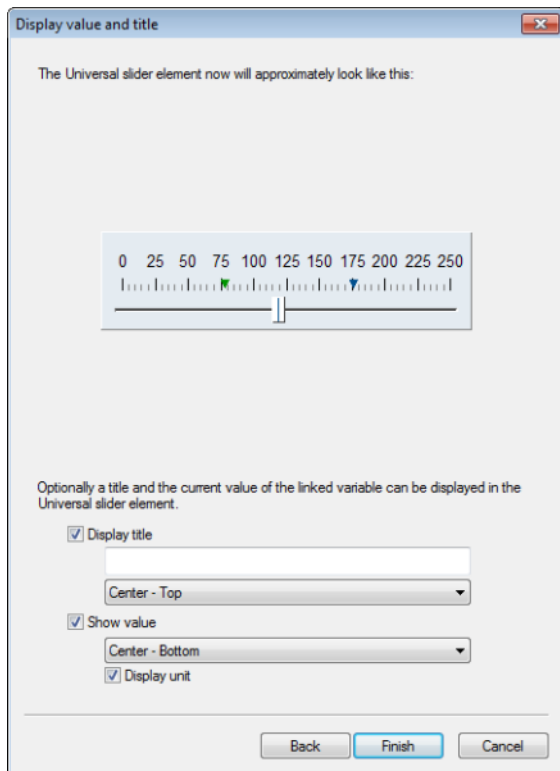


8. select the shape:
slider/turn-around, bar, LED bars or moving scale



9. You are given a preview:

Define the title display and position of the value display.



10. You define other properties in the properties window

Hint: You change the display and shape of a universal slider in properties in the `Universal slider` node



Information

A drag indicator can display the minimum or maximum value of the variables within a certain period of time. Double-clicking the element in runtime resets the marking of minimum and maximum.

COLOR-CODED DISPLAY OF THE LIMIT VIOLATION

At limit violations the color from the variable can color the whole area or only the area starting from the limit violation. This functionality is controlled via property `Bar explicit` in group `Universal slider`.

This property affects only the display of values with defined limits from variables. Limits from reaction matrices are not considered.

Active: If a limit value of the linked variable is breached, only the part of the display that goes into the limit value breach is shown in the color of the respective limit value.

If the variable has several defined limit values, the corresponding areas of the display are each shown in the color of the limit value.

Inactive: If a limit of the linked variable is violated, the complete display is displayed in the color of the violated limit.

Default: `inactive`

10.28 WPF Element

With the `WPF` dynamic element, valid WPF/XAML files in zenon can be integrated and displayed.



Information

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10.28.1 Basics

XAML

XAML stands for **Extensible Application Markup Language**. The description language developed by Microsoft and based on XML defines the syntax in Silverlight applications and WPF user interfaces. XAML makes it possible to separate design and programming. The designer prepares the graphical user interface and creates basic animations that are then used by the developers/project planners. The project planner can control these .xaml files in a purposeful manner and animate them accordingly.

WPF

WPF stands for Windows Presentation Foundation and describes a graphics framework that is part of the Windows .NET framework:

- ▶ WPF displays the programming environment.
- ▶ XAML describes, based on XML, the interface hierarchy as a markup language. Depending on the construction of the XAML file, there is the possibility to link properties, events and transformations of WPF elements with variables and functions of `CD_PRODUCTNAME<`.
- ▶ The framework unites the different areas of presentation such as user interface, drawing, graphics, audio, video, documents and typography.

WPF is, according to Microsoft, supplied with Windows 8, Windows 7, Windows Vista and Windows Server 2008. Microsoft .NET 3.5 is required for execution.

WPF in process visualization

XAML makes different design possibilities possible for zenon. Display elements and dynamic elements can be adapted graphically regardless of the project planning. For example, laborious illustrations are first created by designers and then imported into zenon as an XAML file and linked to the desired logic. There are many possibilities for using this, for example:

DYNAMIC ELEMENTS IN ANALOG-LOOK



Graphics no longer need to be drawn in zenon, but can be imported directly as an XAML file. This makes it possible to use complex, elaborately illustrated elements in process visualization. Reflections, shading, 3D effects etc. are supported as graphics. The elements that are adapted to the respective industry environment make intuitive operation possible, along the lines of the operating elements of the machine.

INTRICATE ILLUSTRATIONS FOR INTUITIVE OPERATION



The integration of XAML-based display elements improves the graphics of projects and makes it very easy to display processes clearly. Elements optimized for usability make operation easier. A clear display

of data makes it easier to receive complex content. The flexible options for adapting individual elements makes it easier to use for the operator. It is therefore possible for the project planners to determine display values, scales and units on their own.

CLEAR PRESENTATION OF DATA AND SUMMARIES



Grouped display elements make it possible to clearly display the most important process data, so that the equipment operator is always informed of the current process workflow. Graphical evaluations, display values and sliders can be grouped into an element and make quick and uncomplicated control possible.

INDUSTRY-SPECIFIC DISPLAYS



Elements such as thermometers, scales or bar graphs are part of the basic elements of process visualization. It is possible, using XAML, to adapt these to the respective industry. Thus equipment operators can find the established and usual elements that they already know from the machines in process visualization at the terminal.

ADAPTATION TO CORPORATE DESIGN



Illustrations can be adapted to the respective style requirements of the company, in order to achieve a consistent appearance through to the individual process screen. For example, the standard operation elements from zenon can be used, which can then be adapted to color worlds, house fonts and illustration styles of the corporate design.

Transfer of values from zenon to WPF

zenon always works internally with the `double` or `string`. These are sent to the WPF element. The WPF element is embedded in a .NET container. It usually needs to be converted so that the data type can be used. This conversion can automatically be carried out by .NET.

The values are sent in accordance with the following rules:

- ▶ If the .NET type (`System.Object`) for zenon is not evident, the value is sent as it is to .NET. .NET must take care of the display or conversion itself.
- ▶ If the .NET type is a Boolean type (`System.Boolean`), then zenon writes according to the .NET convention 0 or -1.
- ▶ If the .NET type is known, a check is carried out to see if .NET can convert the value. The converter from .NET is used for this.
 - Yes: The value is sent.
 - No: The value is sent nevertheless. If .NET reacts with an error message, the value of zenon is converted into a string and sent again.

Referenced objects

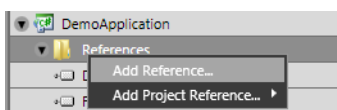
In WPF not only standard objects such as rectangles, buttons, text fields, etc. can be used, but also WPF user controls, which are referenced as assemblies.

WPF user controls are individually created objects. For example, this element can look like a tachometer and provide special properties and optical effects, such as a "Value" property, which causes the pointer of the tachometer to move and display the value when it is set.

The workflow for this:

- ▶ The appearance of a user controls is labeled with standard objects, which are offered by WPF.
- ▶ The properties and interactions are programmed.
- ▶ The whole package is compiled and present in the form of a .NET assembly.

This assembly can also be used for WPF projects. To do this, it must be referenced (linked) in the WPF editor (for example: Microsoft Expression Blend). To do this, select the assembly in the zenon file selection dialog:



From this point in time, the WPF user controls of the assembly in the tool box can be selected under **Custom user controls** and used in the WPF project.

USED REFERENCED ASSEMBLIES IN ZENON

To use an assembly in zenon, this must be provided as a file.

Collective files in `.cdwpx` format administer these independently; no further configuration is necessary.

Assemblies must be added to the `Files` folder for `.xaml` files:

- ▶ Click on `Files` on the project tree
- ▶ Select `Other`
- ▶ Select `Add file...` in the context menu
- ▶ The configuration dialog opens
- ▶ Insert the desired assembly

When displaying a WPF file in the **WPF element** (Editor and Runtime), the assemblies from this folder are loaded. It is thus also ensured that that when the Runtime files are transferred using **Remote Transport**, all referenced assemblies are present on the target computer.

A collective file (`.cdwpx`) can exist alongside an XAML file with the same name. All assemblies (*.dll) from all collective files and the `Other` folder are copied to the work folder. Only the highest file version is used if there are several assemblies with the same name.



Attention

Assemblies are only removed after loading when the application is ended. That means:

If a WPF file with a referenced assembly in zenon is displayed, then this assembly is loaded in the memory until zenon is ended, even if the screen is closed again. If you would like to remove an assembly from the `Files/Other` folder, the Editor must first be restarted, so that the assembly is removed.

MULTI-PROJECT ADMINISTRATION

With multi-project administration, the same assembly must be used in all projects. If an assembly is replaced by another version in a project, it must also be replaced in all other projects that are loaded in the Editor or in Runtime.

Allocation of zenon object to WPF content

zenon objects are allocated to WPF content using the `name` of the WPF object. In doing so, note:

Visual objects do not have a `RuntimeNamePropertyAttribute` property. Therefore at the time when the WPF content is loaded and created, the additional information of `name` is not available.

Thus a clear allocation of zenon objects to WPF objects is not possible. Therefore only logical objects are listed in the configuration dialog of zenon. Which WPF objects the `RuntimeNamePropertyAttribute` has available is visible in MSDN or on the Microsoft website.

WORKAROUND

Nevertheless, the following workaround is possible to animate visual objects:

For visual elements, the animateable property is linked to the text property of an invisible text box using a data connection.

Because the text box as a logical object supports the `name` property, this is displayed in zenon.

The textbox property can also be animated with zenon.

This visual object is also indirectly animated as a result.

Workflows

The WPF/XAML technology makes new workflows in process visualization possible. The separation of design and functionality ensures a clear distinction of roles between the project planners and designers; design tasks can be easily fulfilled by using pre-existing designs, which no longer need to be modified by the project planner.

The following people are involved in the workflow to create WPF elements in zenon:

- ▶ Designer
 - illustrates elements
 - takes care of the graphics for MS Expression Design
- ▶ MS Expression Blend operator
 - Animates elements
 - Creates variables for the animation of WPF elements in zenon, which project planners can access
- ▶ Project planner
 - Integrates elements into zenon:
 - stores logic and functionality

We make a distinction:

- ▶ Workflow with Microsoft Expression Blend (on page 135)
- ▶ Workflow with Adobe Illustrator (on page 135)

Workflow with Microsoft Expression Blend

When using Microsoft Expression Blend, a WPF element is created in four stages:

1. Illustration of elements in **MS Expression Blend** (on page 137)
2. Open element in **MS Expression Design** and export as WPF
3. Animation in **MS Expression Blend** (on page 137)
4. Integration into zenon (on page 181)

You can find an example for creating a WPF elements with Microsoft Expression Blend in the Create button as XAML file with Microsoft Expression Blend (on page 137) chapter.

Workflow with Adobe Illustrator

Based on traditional design processes with **Adobe Illustrator** the following workflow is available:

1. Illustration of elements in **Adobe Illustrator** (on page 141)
2. Import of .ai files and preparation in **MS Expression Design** (on page 143)
3. WPF export from **MS Expression Design** (on page 143)
4. Animation in **MS Expression Blend** (on page 145)
5. Integration into zenon (on page 188)

You can find an example for creation in the Workflow with Adobe Illustrator (on page 141) chapter.

10.28.2 Manual for designer

This section informs you how to correctly create WPF files in Microsoft Expression Blend and Adobe Illustrator. The tutorials on Creating a button element (on page 137) and a bar graph element (on page 141) show you how fully functional WPF files for zenon can be created from pre-existing graphics in a few steps.

The following tools were used for this:

- ▶ Adobe Illustrator CS3 (AI)
- ▶ Microsoft Expression Design 4 (ED)
- ▶ Microsoft Expression Blend 4 (EB)
- ▶ zenon 6.51



Information

If referenced objects (assemblies) are used in WPF, note the instructions in the Referenced objects (on page 132) chapter.

Workflow with Microsoft Expression Blend

With Microsoft Expression Blend, a WPF element:

- ▶ is illustrated
- ▶ is converted into WPF format using **MS Expression Design**
- ▶ animated

The following example shows the illustration and conversion of a button element into an XAML file.

Note: A test version of "Microsoft Expression Blend" can be downloaded from the Microsoft website.

Create button as an XAML file with Microsoft Expression Blend

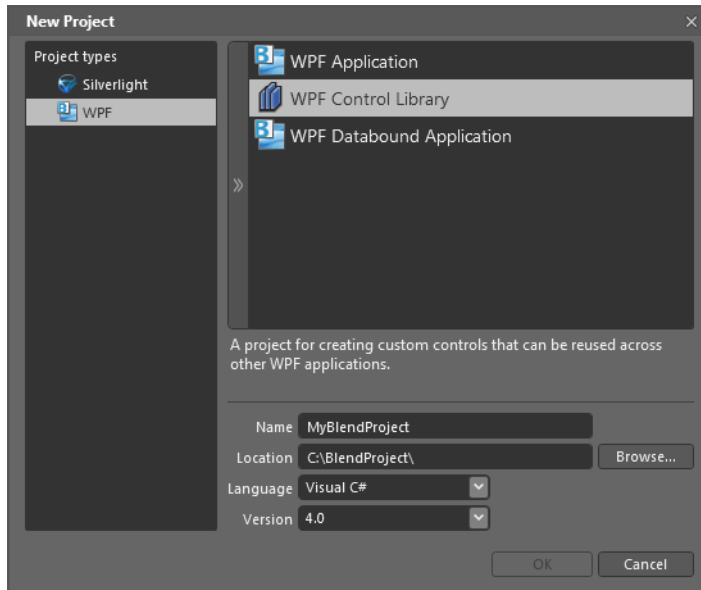
CREATE BUTTON

1. Start Expression Blend
2. select the **New Project** option



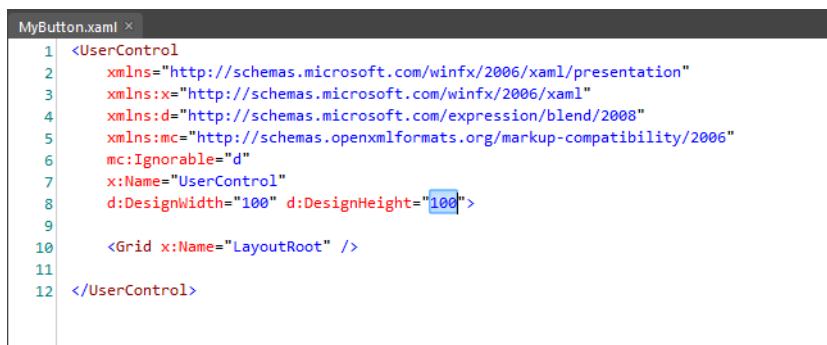
3. Select WPF as project type

4. give it a path and name of your choice (MyBlendProject, for example)



The **Language** and **Version** settings can be ignored, because no functionality is to be programmed.

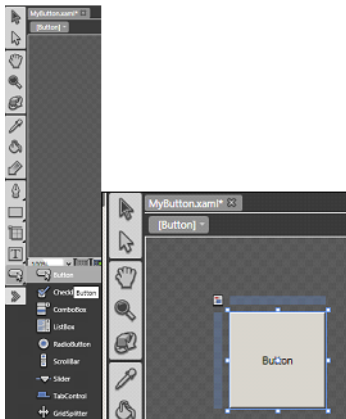
5. After the dialog has been confirmed with **OK**, Microsoft Blend creates a new project with the chosen settings. Expression Blend adds an empty XAML file which already contains a class reference.
6. Delete the CS file that belongs to the XAML file using the context menu.
7. Rename the XAML file **MainControl1.xaml** to **MyButton.xaml**.
8. The development size of the file is set at 640 x 480 pixels as standard and must still be changed:
 - a) switch to **XAML** view
 - b) correct the size to 100 x 100 pixels
 - c) Delete the class reference **x:Class="MyBlendProject.MyButton"**



```

1 <UserControl
2   xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
3   xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
4   xmlns:d="http://schemas.microsoft.com/expression/blend/2008"
5   xmlns:mc="http://schemas.openxmlformats.org/markup-compatibility/2006"
6   mc:Ignorable="d"
7   x:Name="UserControl"
8   d:DesignWidth="100" d:DesignHeight="100">
9
10  <Grid x:Name="LayoutRoot" />
11
12 </UserControl>
  
```

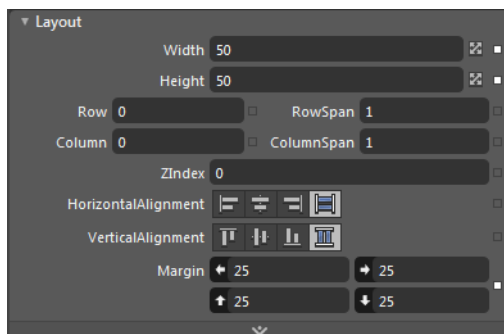
9. switch to **Design** view



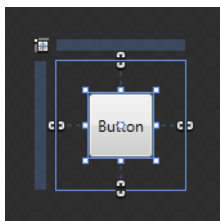
10. add a button via the tool bar

11. define the properties

- Width: 50
- Height: 50
- Margins: 25



The button is therefore at the center of the control.

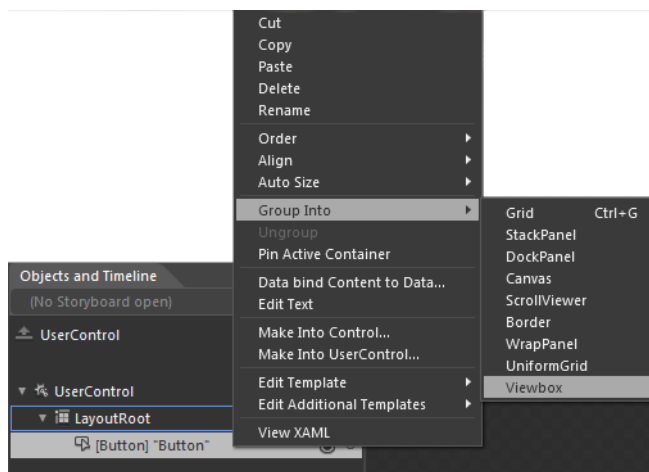


12. Save the changes and open the file in Internet Explorer to check it. You will see that the button is displayed in a size of 50 x 50 pixels.

MAKE BUTTON SCALABLE

If you integrate this status into zenon, the button will always have the exact size of 50 x 50 pixels. Because the button can be implemented as a scalable button, switch to Expression Blend again:

1. select the button in the tree view
2. select the *Group Into->Viewbox* button in the context menu
3. the button is inserted into a **Viewbox**
4. Define the properties of the viewbox
 - Width: Auto
 - Height: Auto
5. save the file



6. If you now open the file in Internet Explorer, the button is automatically scaled when the IE window size is changed. This file will now also automatically adapt to changes in the size of the WPF element in zenon.

CHANGE NAME

Before you can integrate the file into zenon, you must give the WPF element a name. The WPF elements are not named in Expression Blend as standard, and are labeled with square brackets and their type. zenon content is assigned to WPF content via the name of the WPF elements:

- ▶ in tree view, change the name
 - of the button on **MyButton**

- of the `ViewBox` to `MyViewBox`

This button can now be integrated in zenon (on page 181) as an XAML file.

Workflow with Adobe Illustrator

When `Adobe Illustrator` is used, a WPF element:

- ▶ is illustrated in `Adobe Illustrator`
- ▶ is converted into a WPF in `MS Expression Design`
- ▶ is animated in `MS Expression Blend`

The following example shows the illustration and conversion of a bar graph element into an XAML file.

Bar graph illustration

A bar graph is created in Adobe Illustrator.

1. AI: Starting element for bar graph



Illustrated in Adobe Illustrator CS3.

2. AI: Path view of bar graph in Adobe Illustrator



- All effects must be converted (`Object -> Convert appearance`)
- All lines are transformed into paths (`Object -> Path -> Contour line`)
- Do not use filters such as shading, blurring etc.

NOTES ON COMPATIBILITY

Illustrations that were created with Adobe Illustrator are in principle suitable for WPF export. However, not all Illustrator effects can become corresponding effects in Expression Design/Blend. Note:

Effect	Description
Clipping masks	<p>Clipping masks created in Adobe Illustrator are not correctly interpreted by Expression Design. These are usually shown in Blend as areas of black color.</p> <p>We recommend creating illustrations without clipping masks.</p>
Filters and effects	<p>Not all Adobe Illustrator filters are transferred into Expression Design accordingly: Thus blurring filters, shading filters and corner effects from Illustrator do not work in Expression Design.</p> <p>Solution:</p> <ul style="list-style-type: none"> ▶ Most effects can be converted so that they can be read correctly by Expression Design using the Object -> Convert appearance command in Adobe Illustrator. ▶ Corner effects from Adobe Illustrator are correctly interpreted by MS Design if they are converted to AI in paths.
Text fields	<p>To be able to link text fields with code, these must be created separately in Expression Blend. "Labels" are required for dynamic texts; simple "text fields" are sufficient for static information.</p> <p>There is no possibility to create text labels in MS Design. These must be directly created in MS Blend.</p>
Transparencies and group transparencies	<p>There can be difficulties in Adobe Illustrator with the correct interpretation of transparency settings, in particular from group transparency settings.</p> <p>However MS Expression Blend and MS Expression Design do offer the possibility to create new transparency settings.</p>
Multiply levels	<p>These level settings in Adobe Illustrator are not always correctly displayed by MS Expression Blend.</p> <p>However, there is the possibility to "Multiply levels" directly in Expression Design.</p>
Indicating instruments and standard positions	<p>To prepare the graphics optimally for animation, the indicator and slider must always be set to the starting position, usually 0 or 12:00 o'clock.</p> <p>Thus the position parameters for rotations etc. are also correct in Blend and an animation can be implemented without conversion of position data.</p>

WPF export

WPF files are required for animation in Microsoft Expression Blend. We recommend Microsoft Expression Design for this export, because it provides good results and most Illustrator effects are correctly interpreted.

Note: There is a free plug-in for the direct export of WPF files from Adobe Illustrator available on the internet. This plug-in provides a quick, uncomplicated way of exporting from Illustrator, however it is less suited to the current application because it lead to graphical losses. Even color deviations from the original document are possible.

Files in .ai format can regularly be imported into Expression Design; the paths are retained in the process.

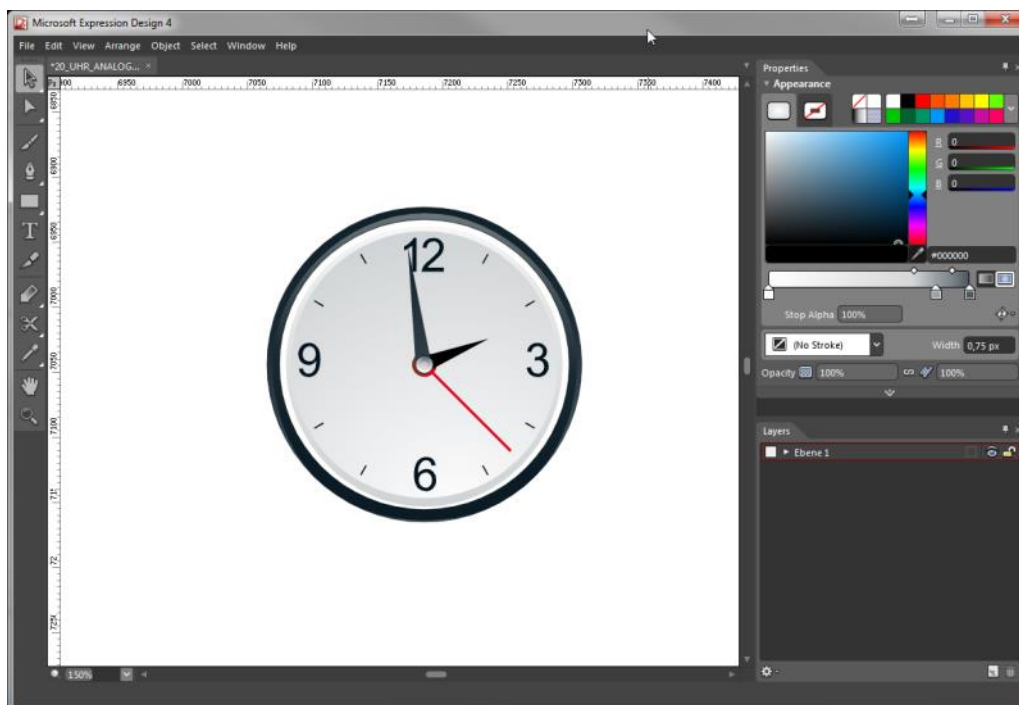
Attention: Some common Illustrator effects cannot be displayed by Expression Design correctly however (see Illustration (on page 141) chapter).

We export the pre-created bar graph element in 5 stages:

1. ED: Import

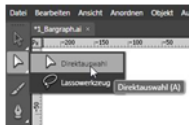
- Import the prepared Illustrator file (on page 141) in **Microsoft Expression Design** Via *File -> Import*

2. ED: Optimization



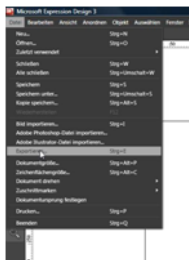
- If the starting file is not correctly displayed in MS Expression Design, it can still be subsequently edited and optimized here

3. ED: Selection



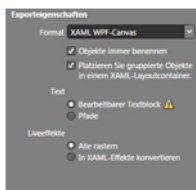
- Highlight the element for WPF export with the **direct selection** arrow in MS Expression Design; in this case it is the whole clock

4. ED: Start export



- Start the export via *File -> Export*
- the dialog for configuring the export settings opens

5. ED: Export settings



- Enter the following export settings:
 - a) Format: XAML Silverlight 4 / WPF Canvas
Always name objects: **Activate with tick**
Place the grouped object in an XAML layout container: **Activate with tick**
 - b) Text: Editable text block
 - c) Line effects: Rasterize all

The exported file has **.xaml** file suffix. It is prepared and animated (on page 145) in MS Expression Blend in the next stage.

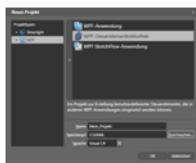
Animation in Blend

With MS Expression Blend:

- ▶ static XAML files from MS Expression Design are animated
- ▶ Variables for controlling effects that can be addressed by zenon are created

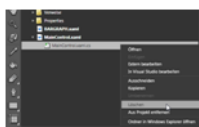
In thirteen steps, we go from a static XAML to an animated element, that can be embedded in zenon:

1. EB:create project



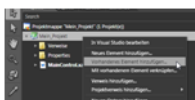
- a) Open Microsoft Expression Blend
- b) Create a new project
- c) Select the **Project type** of *WPF- >WPF Control Library*
- d) Give it a name (in our tutorial: **My_Project**)
- e) Select a location where it is to be saved
- f) Select a language (in our tutorial: **C#**)
- g) Select Framework Version 3.5

2. EB: delete MainControl.xaml.cs



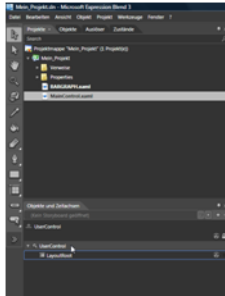
- a) Navigate to **MainControl.xaml.cs**
- b) Delete this file using the **Delete** command in the context menu

3. EB: Open exported XAML file



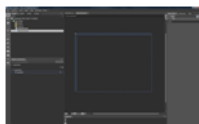
- a) Open the context menu for **My_Project** (right mouse button)
- b) Select **Add existing element...**
- c) Select the XAML file exported from Microsoft Expression Design, in order to open this in Microsoft Expression Blend

4. EB: Open MainControl.xaml



- a) Open the automatically created `MainControl.xaml`
- b) In the `Objects` and `Time axes` area, navigate to the `UserControl` entry

5. EB: Adapt XAML code



- a) Click on `UserControl` with the right mouse button
- b) Select `display XAML` in the contextual menu.
- c) Delete lines 7 and 9 in the XAML code:

```
x:Class="My_Project.MainControl"
d:DesignWidth="640" d:DesignHeight="480"
```

6. EB: check XAML code



- The XAML code should now look like this:

```
<UserControl
```

```
xmlns=http://schemas.microsoft.com/winfx/2006/xaml/presentation
xmlns:x=http://schemas.microsoft.com/winfx/2006/xaml
xmlns:d=http://schemas.microsoft.com/expression/blend/2008
xmlns:mc="http://schemas.openxmlformats.org/markup-compatibility/2006"
```

```
mc:Ignorable="d"
x:Name="UserControl">
```

```
<Grid x:Name="LayoutRoot"/>

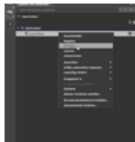
</UserControl>
```

7. EB: Copy elements



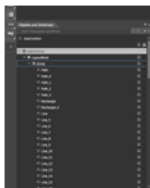
- a) Open the XAML file imported from Expression Design
- b) Mark all elements
- c) Select **Delete** in the context menu
- d) Change back to the automatically created XAML file

8. EB: Insert element



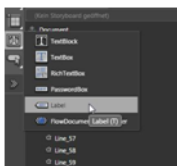
- a) Click on **Layout Root** with the right mouse button
- b) Select **Insert**

9. EB: Adapt layout type



- a) Click on *Layout root* -> *Change layout type* -> *Viewbox* with the right mouse button
- b) The structure should now look like this: **UserControl** -> **LayoutRoot** -> **Grid** -> **Elements**
- c) Give a name for **LayoutRoot** and **Grid** by double-clicking on the names

10. EB: Texts and values



- Dynamic and static texts are labeled with text fields

- Values (numbers) are issued with `Labels`

11. EB: Insert labels



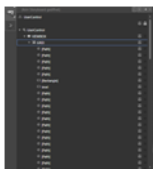
- Labels replace numbers that are to be subsequently linked using INT variables (must be carried out for all number elements)

12. EB: Set property



- To display 100%, set the bar graph element's `MaxHeight` property to 341 (the maximum height of the indicator element is 340)

13. EB: prepare for use in zenon



- Delete all name labels (names may only be given for elements that are to be addressed via zenon)
- Save the XAML file with any desired name
- Integrate the XAML file into zenon (on page 188)

A tip for checking: If the XAML file is displayed with no problems in Microsoft Internet Explorer and the window size of Internet Explorer adapts to it, it will also be correctly used in zenon.

10.28.3 Engineering in zenon

To use WPF with zenon, Microsoft Framework 3.5 must be installed on both the editor computer and on Runtime.

CONDITIONS FOR WPF DISPLAY IN ZENON

The animation is currently available for simple variables; arrays and structures cannot be animated. Therefore the following WPF functions can be implemented in zenon:

- ▶ Element properties that correspond to simple data types, such as `String`, `Int`, `Bool` etc.
- ▶ Element properties of the "Object" type, which can be set with simple data types
- ▶ Element events can be used with functions; the parameters of the events are not however available in and cannot be evaluated in zenon
- ▶ Element transformation, for which a `render transform` is present for the element in the XAML file

Attention: if the content is outside of the area of the WPF element during transformation, this part of the content is lost or is not labeled

Notes on dBase: No shade can be displayed in zenon for WPF elements.



Attention

*If the Runtime files were created for a project for a version **before 6.50**, existing WPF elements are not included into Runtime screens.*

DISPLAY UNDER WINDOWS VISTA/WINDOWS 7

If a WPF screen contains a slider and Windows Vista or Windows 7 Aero Effects are used, this may lead to refresh problems in zenon Editor.

create WPF element

To create a WPF element

1. in the elements toolbar, select the symbol for WPF element or the **E**lements entry in the menu
2. select the start point in the main window
3. pull open the element with the mouse
4. In properties, select `Representation` the property `XAML file` in the group

5. the file selection dialog opens

6. Select the desired file

Files of the following formats are valid

- *.xaml: Extensible Application Markup Language
- *.cdwpx: WPF collective file, also shows preview image

(the file must already be present in the Project Manager under **Files/graphics** or created in the dialog.)

7. configure the link (on page 151)



Information

If referenced objects (assemblies) are used in WPF, note the instructions in the Referenced objects (on page 132) chapter.

CDWPF files (collective files)

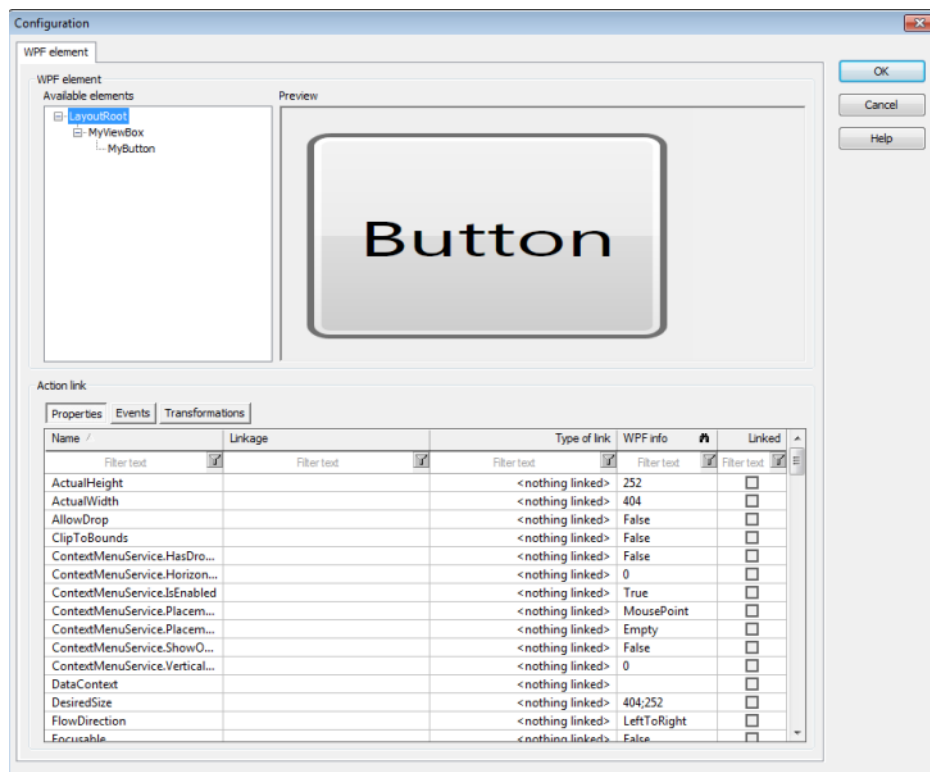
Rules for the use of collective files:

- ▶ The files can be in the ZIP file directly or in a joint folder.
- ▶ The name of the XAML file should correspond to the names of the collective file.
- ▶ Only one XAML file may be contained.
- ▶ The preview graphic should be small and no more than 64 pixels high.
Name of the preview file: **preview.png** or the name of the XAML file with the suffix **png**.
- ▶ Any number of assemblies can be used. The distinction is made on the basis of the file version in numerical form.
- ▶ Collective files do not need to contain an assembly.
- ▶ All folders are searched and only *.dll, *.xaml and *.png files are taken into account.
- ▶ If a collective file (.cdwpx) is replaced by a file with a different version, all corresponding CDWPF files in all symbols and images in all projects must be adapted.

Configuration of the linking

To configure a WPF element

1. In properties, select the Configuration property in the Display group
2. The dialog with three tabs opens with a preview of the XAML file and the elements present in



the file

Parameters	Description
Existing elements	Shows the named file elements in a tree structure. The selected element can be linked with process data. WPF is assigned to process data based on the element name. Therefore elements are only shown if they and the attendant elements have a name. Allocations are configured and shown in the Properties, Events, Transformations tabs.
Preview	The selected element is shown flashing in the preview.
Properties (on page 152)	Configuration and display of properties (variables, authorizations, interlockings, linked values).
Events (on page 160)	Configuration and display of events (functions).
Transformations (on page 162)	Configuration and display of transformations.
Name	Name of the property.
Connection	Selection of link.
Link type	Type of link (variable, authorization, function)
WPF info	Shows the current value for properties in WPF content. For the user, it is directly visible what type of property it is (Boolean, string, etc.).
Linked	Shows if a property is currently being used. Not contained by default in the view, but can be selected using <i>Context menu->Column selection</i> .



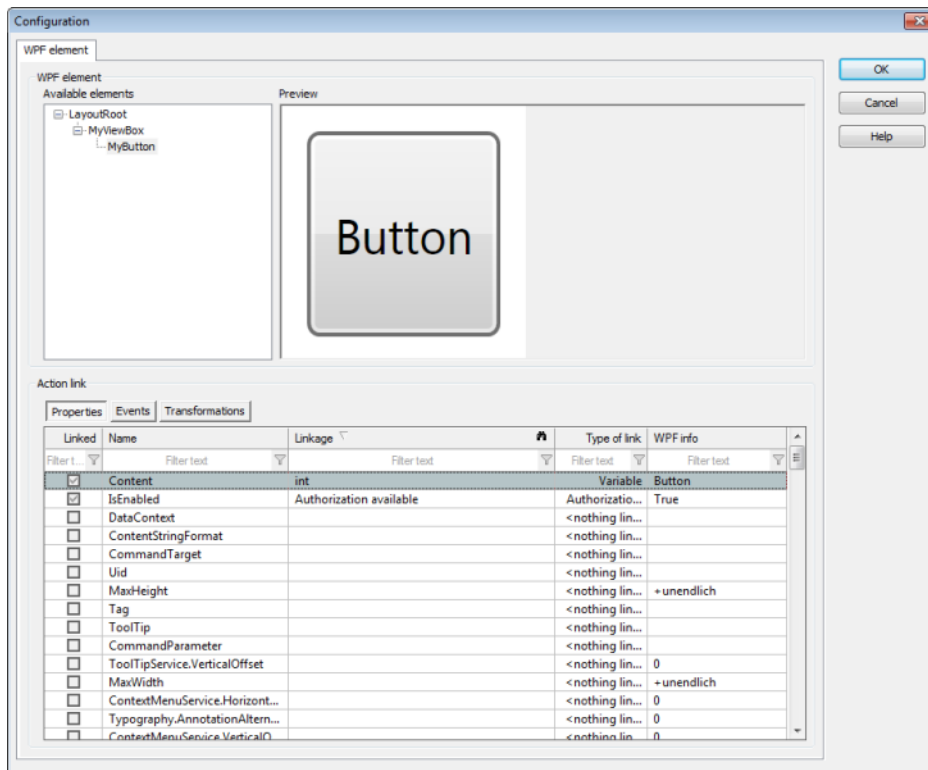
Information

Only logical objects can be displayed in the configuration dialog. Visual objects are not displayed. You can read about backgrounds and how visual objects can be animated in the Allocation of zenon object to WPF content (on page 133).

Properties

The properties enable the linking of:

- ▶ Variables (on page 155)
- ▶ Values (on page 156)
- ▶ Authorizations and interlockings (on page 158)



Parameters	Description
Name	Name of the property.
Connection	Linked variable, authorization or linked value. Clicking in the column opens the respective selection dialog, depending on the entry in the Link type column.
Link type	Selection of linking.
WPF info	Shows the current value for properties in WPF content. For the user, it is directly visible what type of property it is (Boolean, string, etc.).
Linked	Shows if a property is currently being used. Not contained by default in the view, but can be selected using <i>Context menu->Column selection</i> .

CREATE LINK

To create a link:

1. Highlight the line with the property that is to be linked
2. Click in the **Link type** cell
3. select the desired link from the drop-down list.

Available are:

- <not linked> (deletes an existing link)
 - Authorization/interlocking
 - Variable
 - Value linking
4. Click in the **Link** cell
 5. The dialog for configuring the desired link opens



Information

Properties of WPF and zenon can be different. If, for example the visibility property is linked, there are three values available in .NET:

0 - visible

1 - invisible

2- collapsed

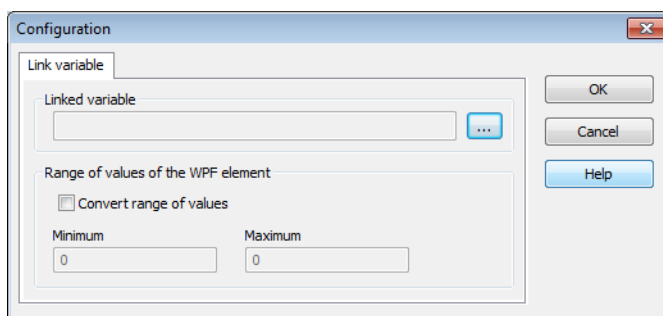
These values must be displayed via the linked zenon variable.

Link variable

To link a variable with a WPF property:

1. Highlight the line with the property that is to be linked
2. Click in the **Link type** cell
3. Select from the **variable** drop down list
4. Click in the **Link** cell
5. The dialog for configuring the variables opens

This dialog also applies for the selection of variables with transformations (on page 162). The configuration also makes it possible to convert from zenon into WPF units.



Parameters	Description
Linked variables	Selection of the variable to be linked. A click on the ... button opens the selection dialog.
Value range of WPF element	Data to convert variable values into WPF values.
Convert value range	<p>Active: WPF unit conversion is switched on.</p> <p>Effect on Runtime: The current zenon value (incl. zenon unit) is converted to the WPF range using standardized minimum and maximum values.</p> <p>For example: The value of a variable varies from 100 to 200. With the variables, the standardized range is set to 100 - 200. The aim is to display this change in value using a WPF rotary knob. For this:</p> <ul style="list-style-type: none"> ▶ for Transformations, the <code>RotateTransform.Angle</code> property is linked to the variables ▶ <code>Adjust value</code> activated ▶ a WPF value range of 0 to 360 is configured <p>Now the rotary knob can be turned at a value of 150, for example, by 180 degrees.</p>
Minimum	Defines the lowest WPF value.
Maximum	Defines the highest WPF value.
OK	Accepts settings and ends the dialog.
Cancel	Discards settings and ends the dialog.
Help	Opens online help.

Link values

Linked values can either be a `string` or a numerical value of the `double` type. When selecting the screen, the selected value is sent in WPF content after loading the WPF content.

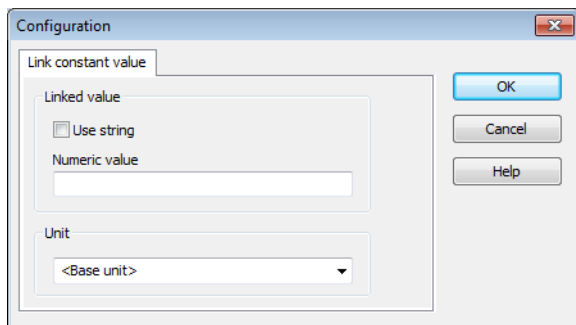


Attention

The data type of the WPF property need not necessarily be **double** or **string**. However only values of the string type or double are sent by zenon. These must be converted to .NET on the WPF page. For details see the Value transfer from zenon to WPF (on page 131) chapter.

To link a value with a WPF property:

1. Highlight the line with the property that is to be linked
2. Click in the **Link type** cell
3. Select **value linkings** from the drop-down list
4. Click in the **Link** cell
5. The dialog for configuration of value linking opens



Parameters	Description
Linked value:	Entry of a numerical value or string value.
Use string	Active: A string value is used instead of a numerical value. The language of string values can be switched. The text is translated in Runtime when the screen is called up and sent in WPF content. If the language is switched whilst the screen is opened, the string value is retranslated and sent.
String value/numerical value	Depending on what is selected for the Use string property, a numerical value or a string value is entered into this field. For numerical values, a unit of measurement can also be selected.
Unit:	Selection of a unit of measurement from the drop down list. You must have configured this in unit switching beforehand. The unit of measurement is allocated with the numerical value. If the units are switched in Runtime, the value is converted to the new unit of measurement and sent to WPF content.
OK	Accepts settings and ends the dialog.
Cancel	Discards settings and ends the dialog.
Help	Opens online help.

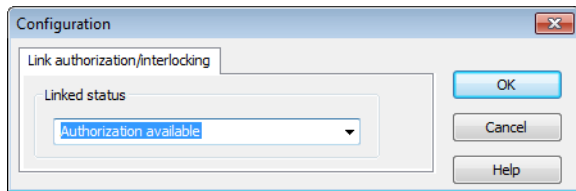
Link authorization or interlocking

Authorizations cannot be granted for the whole WPF element. The element is allocated a user level. Authorizations are granted within the user level for individual controls. If an authorization is active, the value 1 is written to the element.

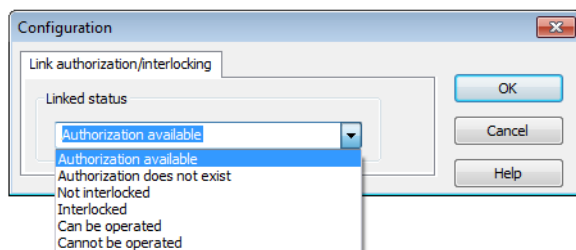
To link an authorization or interlocking with a WPF property:

1. Highlight the line with the property that is to be linked
2. Click in the **Link type cell**
3. Select **Authorization/interlocking** from the drop down menu
4. Click in the **Link cell**

5. The dialog for configuring the authorizations opens



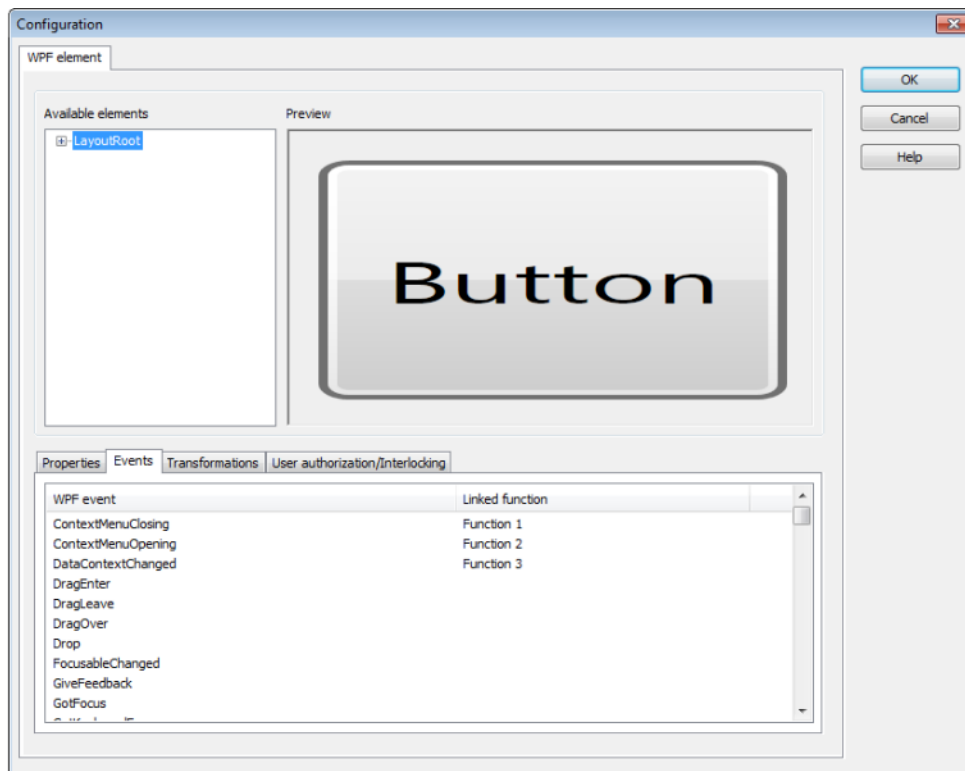
Parameters	Description
Link authorization/interlocking	Setting the authorizations.
Linked status	selection of an authorization that is linked to a WPF control from the drop down list. For example, visibility and operability of a WPF button can depend on a user's status.



Permission	Description
Authorization granted	If the user has sufficient rights to operate the WPF element, a value of 1 is written to the property.
Authorization not present	If the user does not have sufficient rights to operate the WPF element, a value of 1 is written to the property.
Not locked	If the element is not locked, the value 1 is written to the property.
Locked	If the element is locked, the value 1 is written to the property.
Operable	If authorization is present and the element is not locked, then a value of 1 is written to the property.
Not operable	If authorization is not present or the element is not locked, then a value of 1 is written to the property.

Events

Events make it possible to link zenon functions to a WPF element.

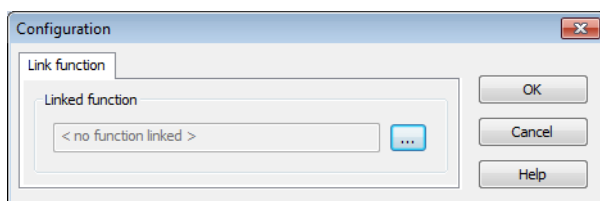


Parameters	Description
Name	Name of the property.
Connection	Linked function. Clicking in the cell opens the configuration dialog.
Link type	Selection of linking. Clicking in the cell opens the selection dialog.
WPF info	Shows the current value for properties in WPF content. For the user, it is directly visible what type of property it is (Boolean, string, etc.).
Linked	Shows if a property is currently being used. Not contained by default in the view, but can be selected using <i>Context menu</i> -> <i>Column selection</i> .

LINK FUNCTIONS

To create a link:

1. Highlight the line with the property that is to be linked
2. Click in the **Link type** cell
3. Select from the drop down list function
4. Click in the **Link** cell
5. The dialog for configuring the function opens

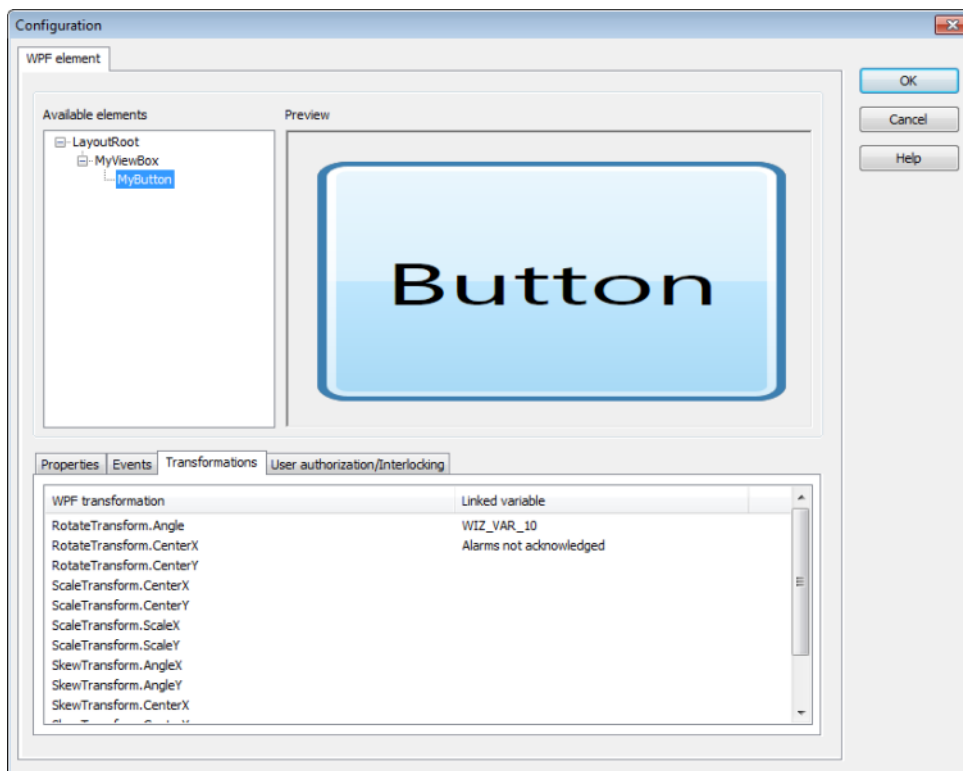


Parameters	Description
Linked function	Selection of the function to be linked. Clicking on the ... button opens the dialog for Function selection (on page 253).
OK	Accepts selection and closes dialog.
Cancel	Discards changes and closes the dialog.
Help	Opens online help.

Transformation

The `WPF element` does not support rotation. If, for example, the `WPF element` is in a symbol and the symbol is rotated, the `WPF element` does not rotate with it. Therefore there is a different mechanism for **Transformation** with WPF to turn elements or to otherwise transform them. These transformations are configured in the **Transformation** tab.

Attention: If the content is outside of the `WPF element` area, this part of the contents is lost, i.e. it is not shown.



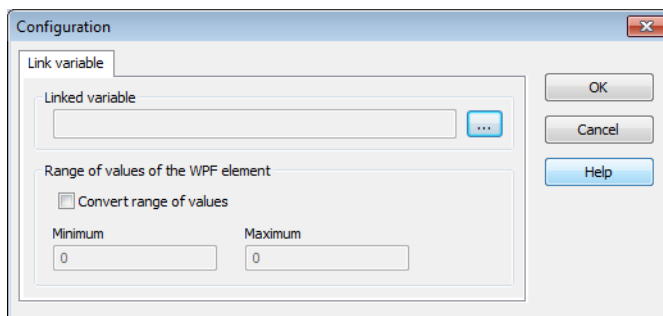
Parameters	Description
Name	Name of the property.
Connection	<p>Selection of the linked variables.</p> <p>Transformations are displayed in XAML as transformation objects with their own properties. If an element supports a transformation, then the possible properties of the transformation object are displayed in list view. (more on this in: Integrate button as WPF XAML in zenon (on page 181))</p> <p>For example, if the linked variable is set at the value of 10, then this value is written as a WPF target and the WPF element is rotated by 10°.</p>
Link type	Selection of transformation link type.
WPF info	Shows the current value for properties in WPF content. For the user, it is directly visible what type of property it is (Boolean, string, etc.).
Linked	<p>Shows if a property is currently being used.</p> <p>Not contained by default in the view, but can be selected using <i>Context menu</i>-><i>Column selection</i>.</p>

LINK TRANSFORMATIONS

To link a transformation with a WPF property:

1. Highlight the line with the property that is to be linked
2. Click in the **Link type** cell
3. Select from the **Transformation** drop down list
4. Click in the **Link** cell
5. The dialog for configuring the variables opens

The configuration also makes it possible to convert from zenon into WPF units.



Parameters	Description
Linked variables	Selection of the variable to be linked. A click on the ... button opens the selection dialog.
Value range of WPF element	Data to convert variable values into WPF values.
Convert value range	<p>Active: WPF unit conversion is switched on.</p> <p>Effect on Runtime: The current zenon value (incl. zenon unit) is converted to the WPF range using standardized minimum and maximum values.</p> <p>For example: The value of a variable varies from 100 to 200. With the variables, the standardized range is set to 100 - 200. The aim is to display this change in value using a WPF rotary knob. For this:</p> <ul style="list-style-type: none"> ▶ for Transformations, the <code>RotateTransform.Angle</code> property is linked to the variables ▶ <code>Adjust value</code> activated ▶ a WPF value range of 0 to 360 is configured <p>Now the rotary knob can be turned at a value of 150, for example, by 180 degrees.</p>
Minimum	Defines the lowest WPF value.
Maximum	Defines the highest WPF value.
OK	Accepts settings and ends the dialog.
Cancel	Discards settings and ends the dialog.
Help	Opens online help.

Validity of XAML Files

XAML files are valid subject to certain requirements:

- ▶ correct name space
- ▶ no class references

- Scalability

CORRECT NAME SPACE

The `WPF element` can only display WPF content, i.e.:

Only XAML files with the correct WPF namespace can be displayed by the `WPF element`. Files that use a Silverlight namespace cannot be loaded or displayed. However, in most cases it is suffice to change the Silverlight namespace to the WPF namespace.

WPF namespace:

```
xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"  
xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
```

NO USE OF CLASS REFERENCES

Because the XAML files can be loaded dynamically, it is not possible to use XAML files that contain references to classes ("class" key in header). Functions that have been programmed in independently-created C#- files cannot be used.

SCALABILITY

If the content of a `WPF element` is adjusted to the size of the `WPF element`, then the controls of the `WPF element` are interlaced in a control that offers this functionality, such as a `view box` for example. In addition, care must be taken to ensure that the `height` and `width` elements are configured as `automatic`.

CHECKING AN XAML FILE TO SEE IF IT IS CORRECT

To check if an XAML file has the correct format:

- Open the XAML file in Internet Explorer
 - If it can be opened without additional plug-ins (Java or similar), then it can be assumed with a high degree of certainty that this file can be loaded and displayed by zenon
 - if problems occur during loading, these are then shown in Internet Explorer and the lines in which problems arise can be clearly seen

The scaling can also be tested in this manner: If the file has been created correctly, the content will adjust to the size of the Internet Explorer window.

ERROR MESSAGE

If an invalid file is used in zenon, then an error message is displayed in the output window when loading the file in the WPF element.

For example:

"error when loading

xaml-Datei:C:\ProgramData\COPA-DATA\SQL\781b1352-59d0-437e-a173-08563c3142e9\FILES\zenon\custom\media\UserControl1.xaml

The attribute "Class" cannot be found in XML namespace

"http://schemas.microsoft.com/winfx/2006/xaml". Line 7 Position 2."

Pre-built elements

zenon is already shipped with several WPF elements. More are available for download in the web shop.

All WPF elements have properties which determine the graphical design of the respective element (Dependency Properties). Setting the values via an XAML file or linking the property via zenon can directly change the look in the Runtime. The following tables contain the respective Dependency Properties, depending on the control.

Elements:

- ▶ Round display (on page 169)
- ▶ Progress bar (on page 174)
- ▶ Vertical bar graph (on page 175)
- ▶ Temperature control (on page 176)
- ▶ Analog clock (on page 177)
- ▶ Universal slider (on page 178)

REPLACING ASSEMBLY WITH A NEWER VERSION

Per project only one assembly for a WPF element can be used in the Editor as well as the Runtime. If two versions of an assembly are available in a project, then the first loaded file is used. A user enquiry is made as to which version should be used. No further actions are needed for the maintenance of the versions used up until now. If a newer version is chosen, all corresponding CDWPF files in all symbols and images in all projects must be adapted.

Note for Multi-Project Administration: If an assembly in a project is replaced by a new version, it must also be replaced in all other projects that are loaded in the Editor or in Runtime.

Circular gauge control

Property	Function	Value
CurrentValue	Current value which should be displayed.	Double
IsReversed	Scale orientation - clockwise or anti-clockwise	Boolean
ElementFontFamily	Element font.	Font
MinValue	Minimum value of the scale.	Double
MaxValue	Maximum value of the scale.	Double
ScaleRadius	Radius of the scale.	Double
ScaleStartAngle	Angle at which the scale starts.	Double
ScaleLabelRotationMode	Alignment of the scale caption.	Enum: <ul style="list-style-type: none"> ▸ None ▸ Automatic ▸ Surround In ▸ Surround Out
ScaleSweepAngle	Angel area which defines the size of the scale.	Double
ScaleLabelFontSize	Font size of the scale caption.	Double
ScaleLabelColor	Font color of the scale caption.	Color
ScaleLabelRadius	Radius on which the scale caption is orientated.	Double
ScaleValuePrecision	Accuracy of the scale caption.	Integer
PointerStyle	Shape of the pointer displaying the value.	Enum: <ul style="list-style-type: none"> ▸ Arrow ▸ Rectangle

		<ul style="list-style-type: none">▶ Triangle Cap▶ Pentagon▶ Triangle
--	--	--

MajorTickColor	Color of main ticks on the scale.	Color
MinorTickColor	Color of sub ticks on the scale.	Color
MajorTickSize	Size of main ticks on the scale.	Size
MinorTickSize	Size of sub ticks on the scale.	Size
MajorTicksCount	Number of main ticks on the scale.	Integer
MajorTicksShape	Shape/type of main ticks on the scale.	Enum: <ul style="list-style-type: none"> ▸ Rectangle ▸ Trapezoid ▸ Triangle
MinorTicksShape	Shape/type of sub ticks on the scale.	Enum: <ul style="list-style-type: none"> ▸ Rectangle ▸ Trapezoid ▸ Triangle
MinorTicksCount	Number of sub ticks on the scale.	Integer
PointerSize	Size of the pointer.	Size
PointerCapRadius	Size of the pointer fastening point.	Double
PointerBorderBrush	Color of pointer border.	Brush
PointerCapStyle	Shape/type of pointer fastening point.	Enum: <ul style="list-style-type: none"> ▸ BackCap ▸ FrontCap ▸ Screw
PointerCapBorderBrush	Color of pointer fastening point.	Brush

PointerBrush	Color of pointer.	Brush
GaugeBorderBrush	Color of the element border.	Brush
GaugeBackgroundBrush	Color of element background.	Brush
PointerCapColorBrush	Color of pointer fastening point.	Brush
GaugeMiddlePlate	Radius of the element background middle plate.	Double
PointerOffset	Offset of the pointer (displacement).	Double
RangeRadius	Radius of the total range display.	Double
RangeThickness	Thickness of the total range display.	Double
RangeStartValue	Start value of the total range display.	Double
Range1EndValue	End value of the 1st area and start value of the 2nd range.	Double
Range2EndValue	End value of the 2nd area and start value of the 3rd range.	Double
Range3EndValue	End value of the 3rd area and start value of the 4th range.	Double
Range4EndValue	End value of the 4th area and start value of the 5th range.	Double
Range5EndValue	End value of the 5th area and start value of the 6th range.	Double
Range6EndValue	End value of the 6th range.	Double
Range1ColorBrush	Color of the first range.	Brush
Range2ColorBrush	Color of the second range.	Brush
Range3ColorBrush	Color of the third range.	Brush
Range4ColorBrush	Color of the fourth range.	Brush
Range5ColorBrush	Color of element fifth range.	Brush
Range6ColorBrush	Color of element sixth range.	Brush
ScaleOuterBorderBrush	Color of the scale border.	Brush
ScaleBackgroundBrush	Color of scale background.	Brush

ValueTextFrameStyle	Shape/type of value display.	Enum: <ul style="list-style-type: none"> ▸ LargeFrame ▸ SmallFrame ▸ None
ValueTextContent	Content of the value display.	Enum: <ul style="list-style-type: none"> ▸ Text ▸ TextValue ▸ Value
ValueTextSize	Font size of the value display.	Double
ValueTextColor	Font size of the value display.	Color
IsGlasReflection	Activate the glass effect on the element.	Boolean
GaugeOffsett	Lowering the rotation point of the whole element.	Double

Progress bar - ProgressBarControl

Property	Function	Value
CurrentValue	Current value which should be displayed.	Double
MinValue	Minimum value of the value area.	Double
MaxValue	Maximum value of the value area.	Double
ProgressbarDivisionCount	Number of divisions of the progress bar.	Integer
VisibilityText	Visibility of the value display.	Boolean
TextSize	Font size of the value display.	Double
TextColor	Color of the value display.	Color
ProgressBarBoxedColor	Color of the border of the progress bar.	Color
ProgressBarMarginDistance	Distance of the progress bar box from the element edge (left, top, right, down).	Double
ProgressBarInactiveBrush	Indicator color not active.	Brush
ProgressBarActiveBrush	Indicator color active.	Brush
ProgressBarPadding	Distance of the progress bar from the progress bar box (left, top, right, down).	Double
ElementBorderBrush	Color of the element border.	Brush
ElementBackgroundBrush	Color of element background.	Brush

Bar graph vertical - VerticalBargraphControl

Property	Function	Value
CurrentValue	Current value which should be displayed.	Double
MinValue	Minimum value of the scale.	Double
MaxValue	Maximum value of the scale.	Double
MajorTicksCount	Number of main ticks on the scale.	Integer
MinorTicksCount	Number of sub ticks on the scale.	Integer
MajorTickColor	Color of main ticks on the scale.	Color
MinorTickColor	Color of sub ticks on the scale.	Color
ElementBorderBrush	Color of the element border.	Brush
ElementBackgroundBrush	Color of element background.	Brush
ElementGlassReflection	Activate the glass effect on the element.	Visibility
ElementFontFamily	Element font.	Font
ScaleFontSize	Font size of the scale.	Double
ScaleFontColor	Font color of the scale.	Color
IndicatorBrush	Bar graph fill color.	Brush
BargraphSeparation	Number of bar graph division.	Integer
BargraphSeparationColor	Color of the scale division.	Color

Temperature indicator - TemperatureIndicatorControl

Property	Function	Value
CurrentValue	Current value which should be displayed.	Double
MinValue	Minimum value of the scale.	Double
MaxValue	Maximum value of the scale.	Double
MajorTicksCount	Number of main ticks on the scale.	Integer
MinorTicksCount	Number of sub ticks on the scale.	Integer
TickNegativColor	Color of the negative main tick (gradient to TickPositivColor).	Color
TickPositivColor	Color of the positive main tick (gradient to TickNegativColor).	Color
MinorTickColor	Color of the sub ticks.	Color
ElementBorderBrush	Color of the element border.	Brush
ElementBackgroundBrush	Color of element background.	Brush
ElementGlassReflection	Activate the glass effect on the element.	Visibility
ElementFontFamily	Element font.	Font
IndicatorColor	Color of the indicator fill color.	Color
IndicatorBorderColor	Color of the indicator border.	Color
MajorTickSize	Size of main ticks on the scale.	Size
MinorTickSize	Size of sub ticks on the scale.	Size
ScaleLetteringDistance	Distance of the scale caption (vertical), each x. main tick should be captioned.	Integer
IndicatorScaleDistance	Distance between indicator and scale (horizontal).	Double
ScaleFontSize	Font size of the scale.	Double
ScaleFontColor	Font color of the scale.	Color
Unit	Unit.	String

ElementStyle	Shape/type of element.	Enum: <ul style="list-style-type: none"> ▸ SmallFrame ▸ Unit ▸ None
--------------	------------------------	---

Analog clock - AnalogClockControl

Property	Function	Value
ElementStyle	Shape/type of element.	Enum: <ul style="list-style-type: none"> ▸ SmallNumbers ▸ BigNumbers ▸ No
ElementBackgroundBrush	Color of element background.	Brush
ElementGlassReflection	Activate the glass effect on the element.	Visibility
Offset	Value in hours (h) which displays the time lag to the system clock.	Int16
OriginText	Text which is displayed in the clock (e.g. location).	String

Universal slider - UniversalReglerControl

Property	Function	Value
CurrentValue	Current value which should be displayed.	Double
ElementFontFamily	Element font.	Font
MinValue	Minimum value of the scale.	Double
MaxValue	Maximum value of the scale.	Double
Radius		Double
ScaleRadius	Radius of the scale.	Double
ScaleStartAngle	Angle at which the scale starts.	Double
ScaleLabelRotationMode	Alignment of the scale caption.	Enum: <ul style="list-style-type: none"> ▸ None ▸ Automatic ▸ SurroundIn ▸ SurroundOut
ScaleSweepAngle	Angel area which defines the size of the scale.	Double
ScaleLabelFontSize	Font size of the scale caption.	Double
ScaleLabelColor	Font color of the scale caption.	Color
ScaleLabelRadius	Radius on which the scale caption is orientated.	Double
ScaleValuePrecision	Accuracy of the scale caption.	Integer
ElementStyle	Display type of the element	Enum: <ul style="list-style-type: none"> ▸ Knob ▸ Plate ▸ None
MajorTickColor	Color of main ticks on the scale.	Color
MinorTickColor	Color of sub ticks on the scale.	Color

MajorTickSize	Size of main ticks on the scale.	Size
MinorTickSize	Size of sub ticks on the scale.	Size
MajorTicksCount	Number of main ticks on the scale.	Integer
MajorTicksShape	Shape/type of main ticks on the scale.	Enum: <ul style="list-style-type: none"> ▸ Rectangle ▸ Trapezoid ▸ Triangle
MinorTicksShape	Shape/type of sub ticks on the scale.	Enum: <ul style="list-style-type: none"> ▸ Rectangle ▸ Trapezoid ▸ Triangle
MinorTicksCount	Number of sub ticks on the scale.	Integer
BackgroundBorderBrush	Color of the element border.	Brush

BackgroundBrush	Color of element background.	Brush
PointerCapColorBrush	Color of pointer fastening point.	Brush
GaugeMiddlePlate	Radius of the element background middle plate.	Double
ValueFontSize	Font size of the value display.	Double
ValueFontColor	Font size of the value display.	Color
IsGlasReflection	Activate the glass effect on the element.	Boolean
KnobBrush	Color of the knob.	Brush
IndicatorBrush	Color of the indicator.	Brush
IndicatorBackgroundBrush	Background color of the inactive indicator.	Brush
KnobSize	Diameter of the knob.	Double
KnobIndicatorSize	Indicator size of the knob.	Size
ElementSize	Size of the element.	Size
VisibilityKnob	Activating of the knob.	Boolean
ValuePosition	Position of the value display.	Double
ValueVisibility	Activating the value display.	Boolean

Examples: Integration of WPF in zenon

You can see how XAML files are created and integrated as WPF elements in zenon from the following examples:

- ▶ Integrate button as WPF XAML in zenon (on page 181)
- ▶ Integrate bar graph as WPF XAML in zenon (on page 188)
- ▶ Integrate DataGrid Control in zenon (on page 193)

Integrate button as WPF XAML in zenon

Example structure:

- ▶ Creating a button (on page 137) in Microsoft Expression Blend
- ▶ Integrate into zenon
- ▶ Link to a variable and a function
- ▶ adjust the button to the size of the element
- ▶ Create button

As a first step, create a button as described in the Create button as XAML file with Microsoft Expression Blend (on page 137) chapter. To be able to use the XAML file in zenon, insert this in the project tree in the **Files/graphics** folder.

INTEGRATE BUTTON

Note: A zenon project with the following content is used for the following description:

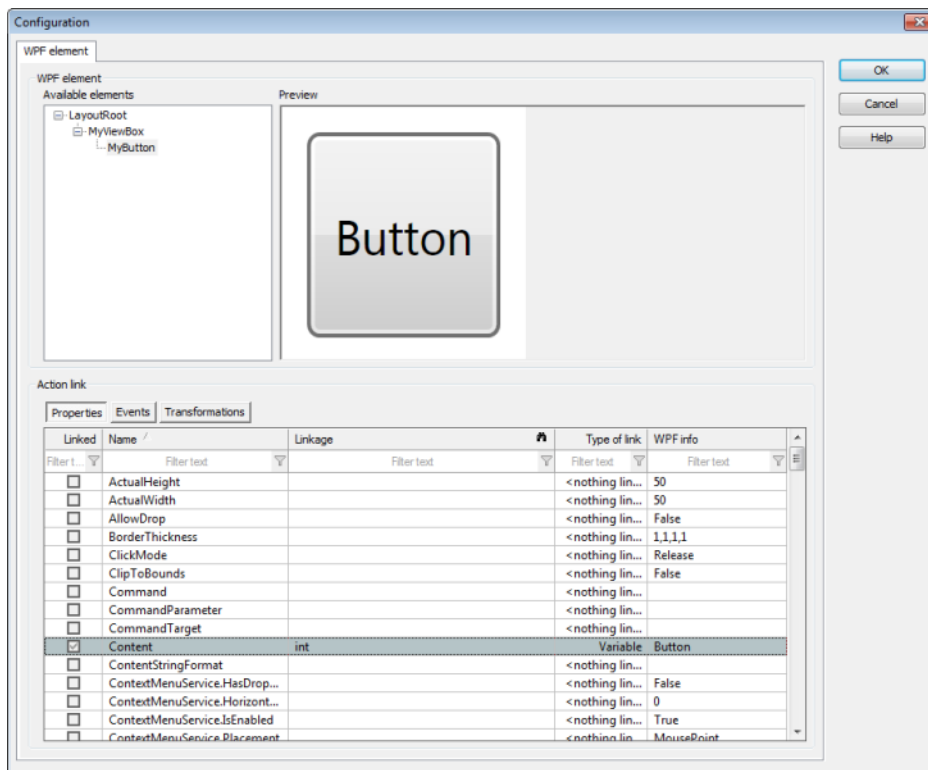
- ▶ An empty screen as a start screen
- ▶ an internal variable `int` of type `Int`
- ▶ a function `Funktion_0` of type `Send value to hardware` with:
 - `Direct to hardware` option activated
 - `Set` was set to `45`

To integrate the button:

1. open the empty screen
2. place a `WPF element` (on page 149) in the screen
3. select `XAML file` in the properties window
4. select the XAML file (e. g. `MyButton.xaml`) and close the dialog
5. select the `Configuration` property

CONFIGURE THE BUTTON

The configuration dialog shows a preview of the selected XAML file. All elements named in the XAML file are listed in the tree:

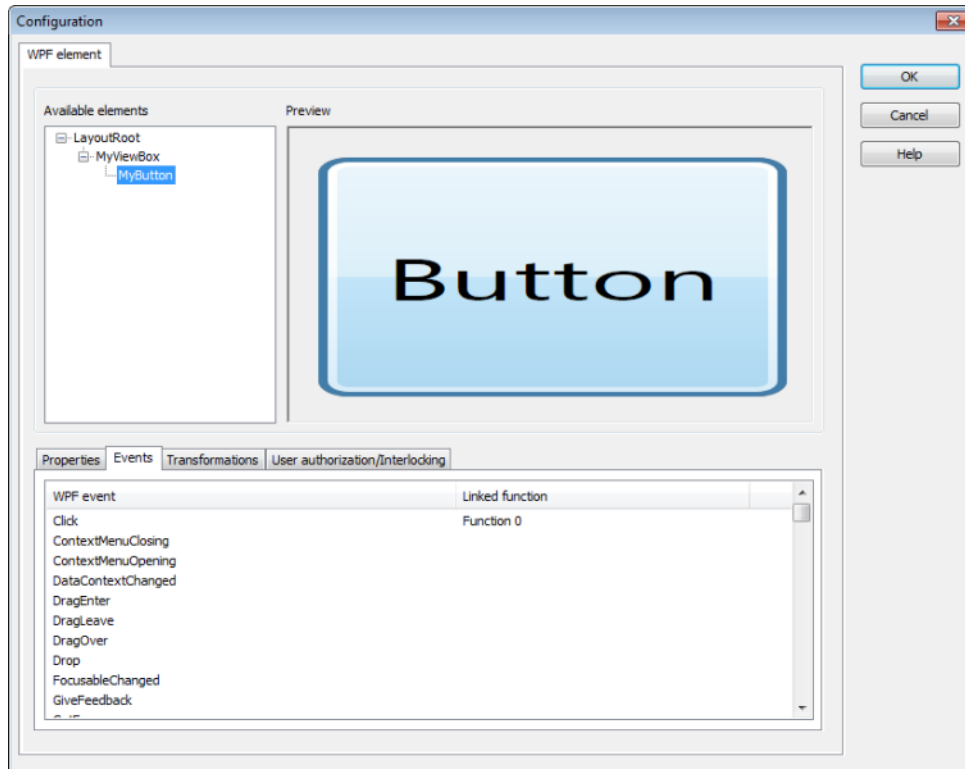


1. select the WPF button, which is in *LayoutRoot->MyViewBox->MyButton*
2. Look in the **Properties** **EntryContent** tab; this contains the button's text
3. Click the **Link** **type** column
4. Select **variable** from the drop down list
5. Click in the **Link** column
6. the variable selection dialog is opened
7. select the **int** variable to link this variable with the **content** property

EVENTS

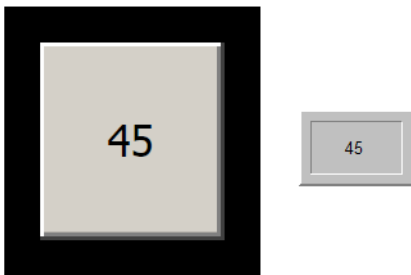
To also assign events:

1. select the events tab



2. look for the 'Click' entry, this event is triggered by the WPF element, as soon as the button is clicked
3. Click in the **Link type** column
4. Select **Function** from the drop down list
5. Click in the **Link** column
6. the **function selection dialog** is opened
7. select **Function_0**
8. Confirm the changes with **OK**
9. Insert a `numerical value` element into the screen
10. Link this `numerical value` element to the `int` variables too.
11. Compile the Runtime files and start Runtime.

The `WPF` element is displayed in Runtime, the button text is 0. As soon as you click on the button, the `click` event is triggered and the `set value` function is carried out. The value 45 is sent directly to the hardware and both `numerical value` and `button` display the value 45 .

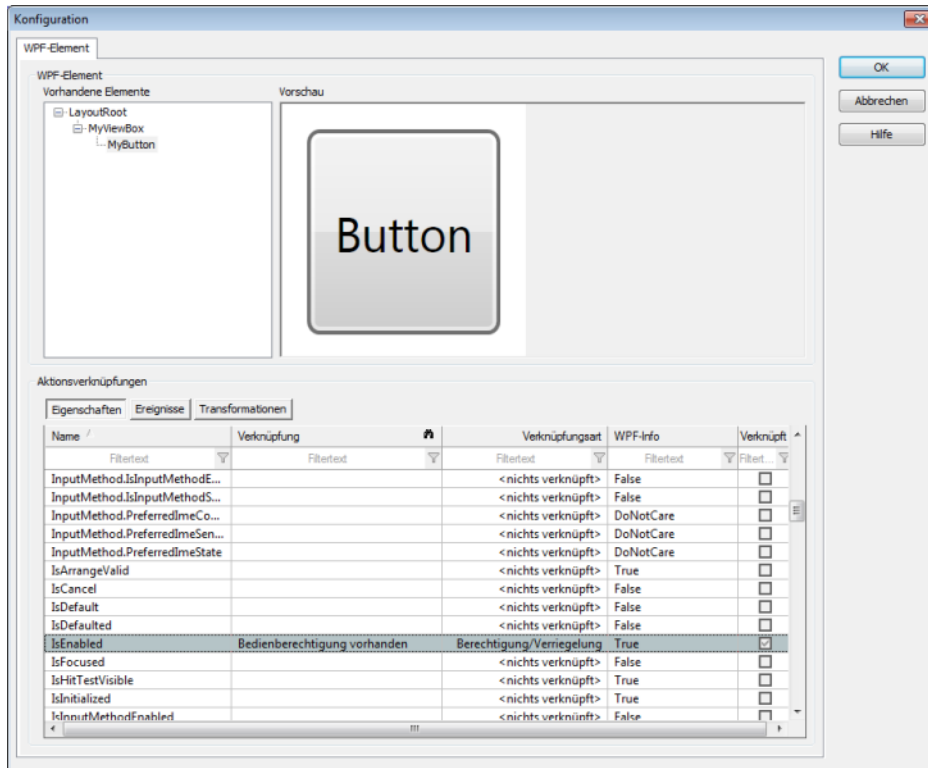


Define a set value of 30 via the `numerical value` element; this value is then also assumed by the `WPF` element.

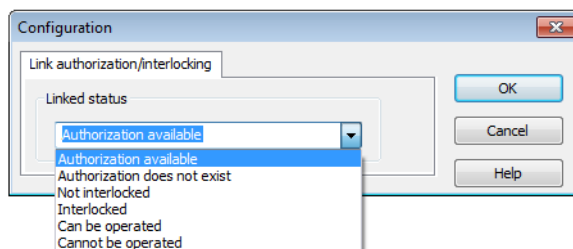
AUTHORIZATION

Similar to a `numerical value`, a `WPF` element can be locked according to authorizations (lock symbol) or switched to be operable. Set the user authorization level to 1 for the `WPF` element and create a user called **Test** with authorization level 1. In addition, set up the functions `Login` with `dialog` and `Logout` . You link these two functions with 2 new text buttons on the screen.

In the WPF element configuration dialog, select the **MyButton** WPF button and select the **Properties:** tab

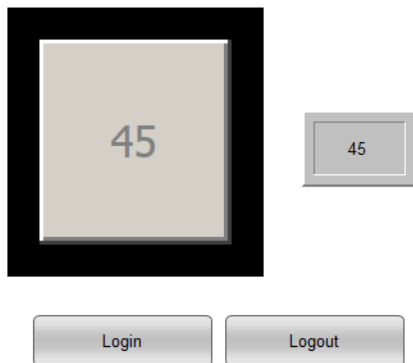


1. Select the **IsEnabled** element
2. Click in the **Link type** column
3. Select **Authorizations/interlocking** from the drop down list
4. Click in the **Link** column
5. In the drop-down list, select the **Authorized** option



6. Close the dialog with **OK**

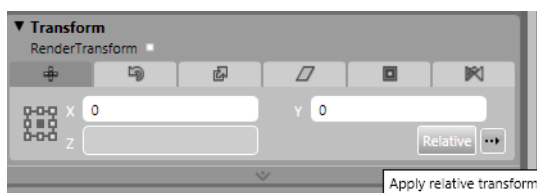
Compile the Runtime file and note that Authorizations to be Transferred must also be selected. After Runtime has been started, the WPF button is displayed as deactivated on the screen and cannot be operated. If you now log in as the user **Test**, the button is activated and can be operated. The button is locked again as soon as you log out.



TRANSFORMATION

The XAML files must still be adapted to use transformations:

1. switch to the **Expression Blend** program
2. select **MyButton**, so that the properties of the element are visible in the events window



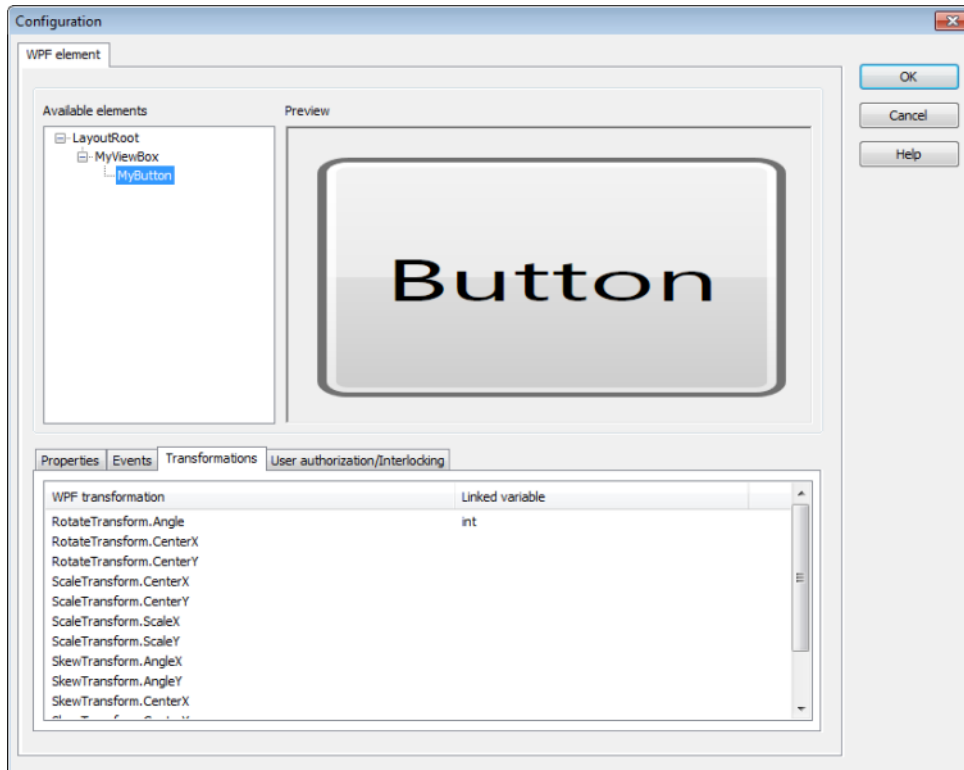
3. Under **Transform** at **RenderTransform** select the **Apply relative transform** option

As a result of this, a block is inserted into the XAML file, which save the transformation settings in runtime.

```
<Button.RenderTransform>
  <TransformGroup>
    <ScaleTransform ScaleX="1" ScaleY="1"/>
    <SkewTransform AngleX="0" AngleY="0"/>
    <RotateTransform Angle="0"/>
    <TranslateTransform X="0" Y="0"/>
  </TransformGroup>
</Button.RenderTransform>
```

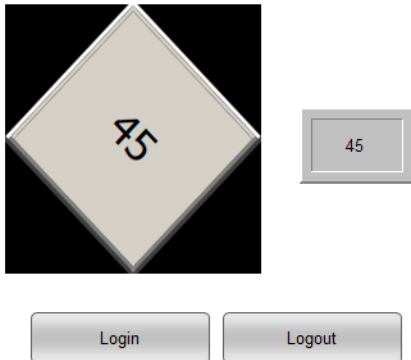
4. Save the file and replace the old version in zenon with this new file.
5. Open the **WPF element configuration** dialog again:

- a) select the `MyButton` button
- b) select the `Transformations` tab



- c) select the `RotateTransform.Angle` element
- d) Click in the `Link` type column
- e) Select `Transformations` from the drop down list
- f) Click in the `Link` column
- g) the variable selection dialog is opened
- h) select the `int` variable to link this variable with the `RotateTransform.Angle` property

Compile the Runtime files and start Runtime. Log in as the `test` user and click on the button. The button has the value 45 and the WPF element rotates by 45°.



Integrate bar graph as WPF XAML in zenon

Example structure:

- ▶ Creating a bar graph (on page 141) in Adobe Illustrator and converting it to WPF
- ▶ Integrate into zenon
- ▶ Linking with variables
- ▶ Adapting the bar graph WPF element

CREATE BAR GRAPH

The first step is to generate a bar graph as described in the Workflow with Adobe Illustrator (on page 141) chapter. To be able to use the XAML file in zenon, insert this in the project tree in the `Files/graphics` folder.

INTEGRATE BAR GRAPH

Note: A zenon project with the following content is used for the following description:

- ▶ An empty screen as a start screen
- ▶ Four variables from the internal driver for
 - Scale 0
 - Scale `central`

- Scale `high`
- Current value

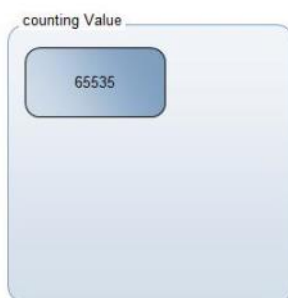
- ▶ A variable from the mathematics driver for displaying the current value (255)

To integrate the bar graph:

1. open the empty screen
2. place a `WPF element` (on page 149) in the screen
3. select `XAML file` in the properties window
4. Select the desired XAML file (for example `bar_graph_vertical.xaml`) and close the dialog

ADJUST BAR GRAPH

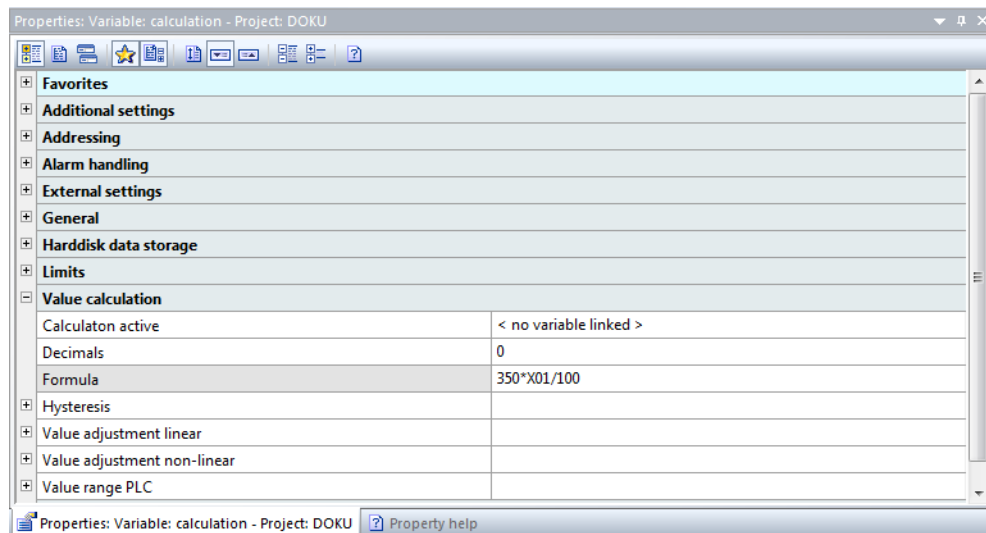
Before configuration, the scale of the XAML file is adapted if necessary:



To do this:

- Create a new mathematics variable that calculates the new value in relation to the scaling, for example:

- Variable: 0-1000
- Mathematic variable {value created in xaml file}*Variable/1000

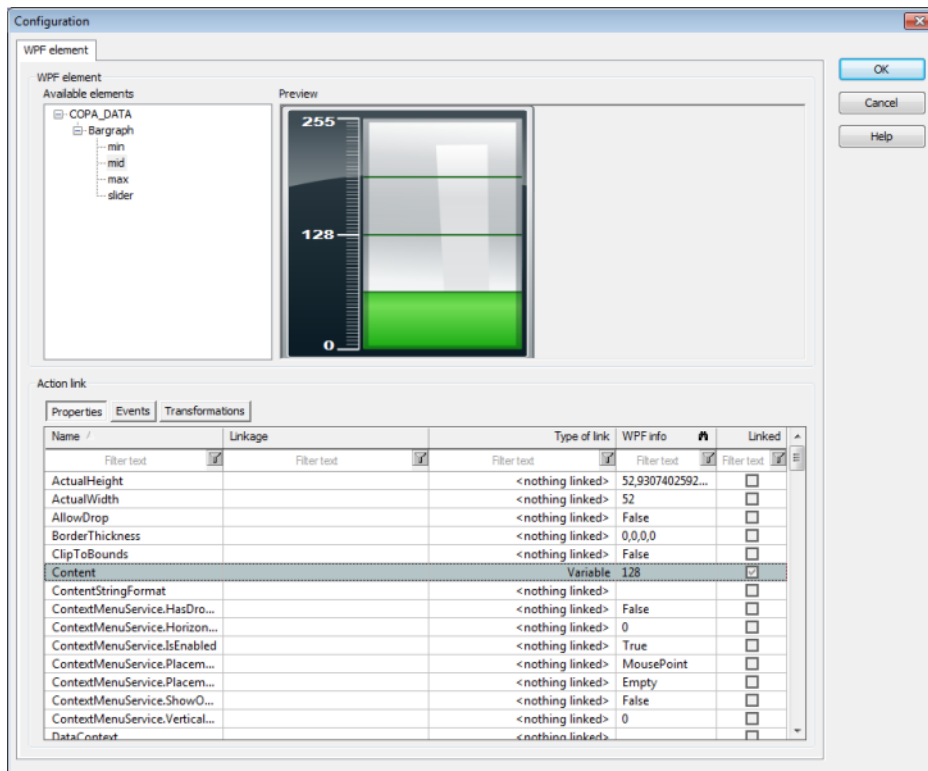


The XAML file is then configured.

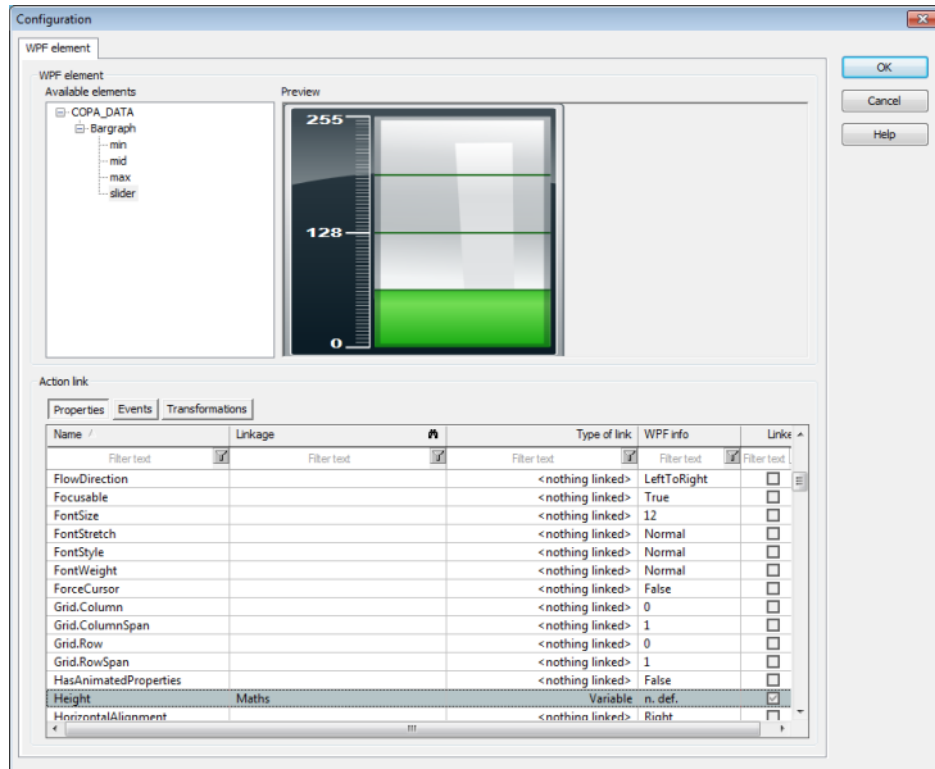
CONFIGURE BAR GRAPH

1. Click on the WPF element and select the `Configuration` property
2. The configuration dialog shows a preview of the selected XAML file.

3. Select the minimum value, the average value and the maximum value and link each of these to the corresponding variable in the **Content** property

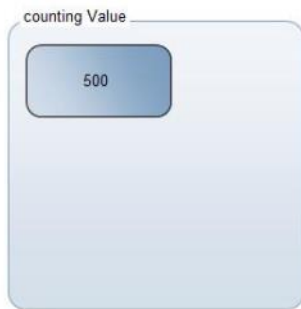


4. Select the **slider** and link the **value** property to the mathematics variables (in our example:



calculation)

5. Check the project planning in Runtime:



Integrate DataGrid Control in zenon

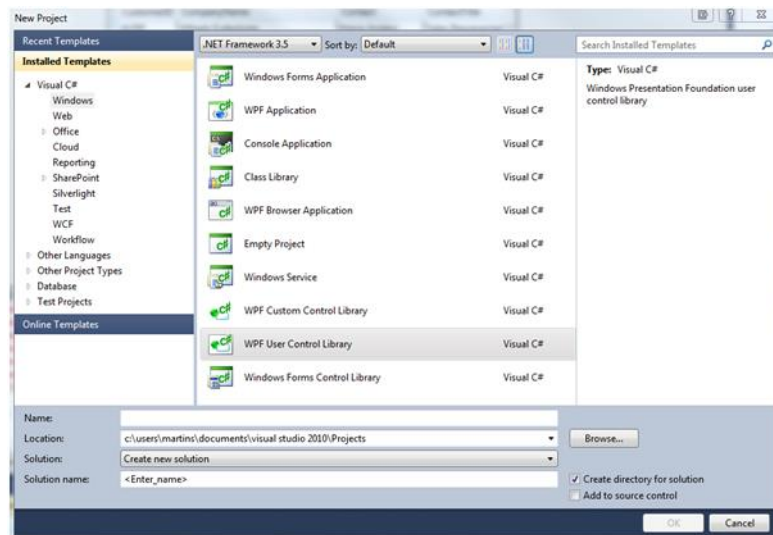
To create DataGrid control, you need:

- ▶ WPF Toolkit: available as a download at <http://wpf.codeplex.com> (<http://wpf.codeplex.com>)
- ▶ Visual Studio

Ensure that you always create projects that are based on **.NET Framework 3.5**.

CREATE WPF USER CONTROL

1. Create a WPF User Control in Visual Studio.

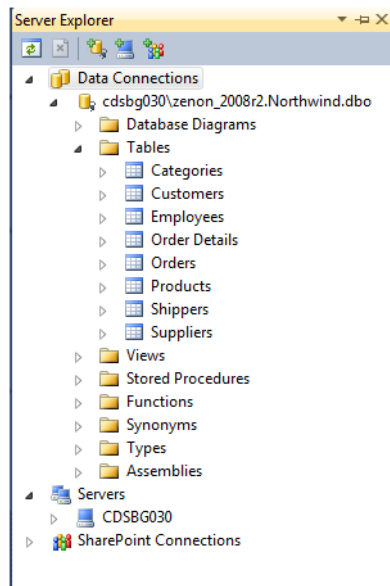


In our example, it is given the name **MyWPFLibrary**.

2. Add the WPF Toolkit assemblies to the references. To do this:
 - a) Right-click on the project
 - b) Select **Add reference...**
 - c) Select this in the **.NET** tab
 - d) Select **system.Data** and **system.Data.DataSetExtensions** too if these are not already present
3. Create a new data connection in Server Explorer. To do this:
 - a) right-click on **Data Connections**
 - b) Select **Add connection...**

In our example, the database **Northwind** is used; this has been created by Microsoft as an example database.

After adding the connection, the Server Explorer window should look a little like this:

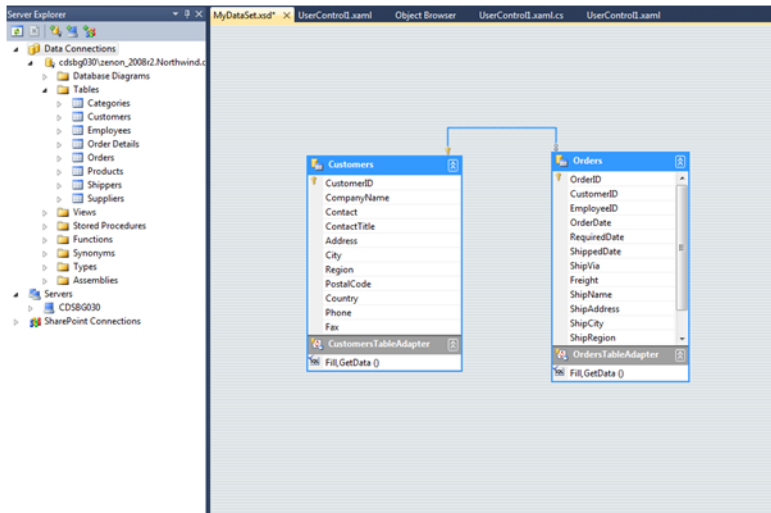


A new DataSet is created in the next step.

CREATING A DATASET

1. Right-click on the project
2. In the context menu, select the **Ad New Item...**
3. Create a new DataSet.
4. double click the DataSet It should now open in the designer.

5. Drag the tables that you need into the DataSet design window.



The XAML file is configured in the next step.

CONFIGURATION OF XAML FILE

1. Insert the **namespaces** into the XAML file.

You need the **namespace** of the WPF toolkits and a reference to the class:

```

design  + XAML
<UserControl x:Class="MyWPFLibrary.UserControl1"
  xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
  xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
  xmlns:mc="http://schemas.openxmlformats.org/markup-compatibility/2006"
  xmlns:d="http://schemas.microsoft.com/expression/blend/2008"
  mc:Ignorable="d"
  d:DesignHeight="300" d:DesignWidth="300"
  → xmlns:my="http://schemas.microsoft.com/wpf/2008/toolkit"
  → xmlns:my1="clr-namespace:MyWPFLibrary">

```

2. Define the resources and the DataGrid that is to be used in the WPF:

```
<UserControl.Resources>
```

```
<my1:MyDataSet x:Key="MyDataSet" />
```

```
<CollectionViewSource x:Key="customersViewSource" Source="{Binding Path=Customers,
Source={StaticResource MyDataSet}}"/>
```

```
</UserControl.Resources>
```

```
<Grid DataContext="{StaticResource customersViewSource}">
```

```
<my:DataGrid Height="304" HorizontalAlignment="Left" Margin="6,7,0,0"
Name="dataGrid1" VerticalAlignment="Top" Width="497"
```

```
DisplayMemberPath="CompanyName" ItemsSource="{Binding}"
SelectedValuePath="CustomerID" />

</Grid>
```

3. Open the code-behind file (`xaml.cs`) and insert the following lines in the constructor:

```
public UserControl1()
{
    InitializeComponent();

    MyWPFLibrary.MyDataSet ds =
        ((MyWPFLibrary.MyDataSet)(this.FindResource("MyDataSet")));

    MyWPFLibrary.MyDataSetTableAdapters.CustomersTableAdapter ta = new
        MyWPFLibrary.MyDataSetTableAdapters.CustomersTableAdapter();

    ta.Fill(ds.Customers);

    System.Windows.Data.CollectionViewSource customersViewSource =
        ((System.Windows.Data.CollectionViewSource)(this.FindResource("customersViewSource")));

    customersViewSource.View.MoveCurrentToFirst();
}
```

This has the following effect:

- Get DataSet
- Create a new ReportAdapter
- Fill DataSet
- Provide this information to the DataGrid Control

The solution can now be built.

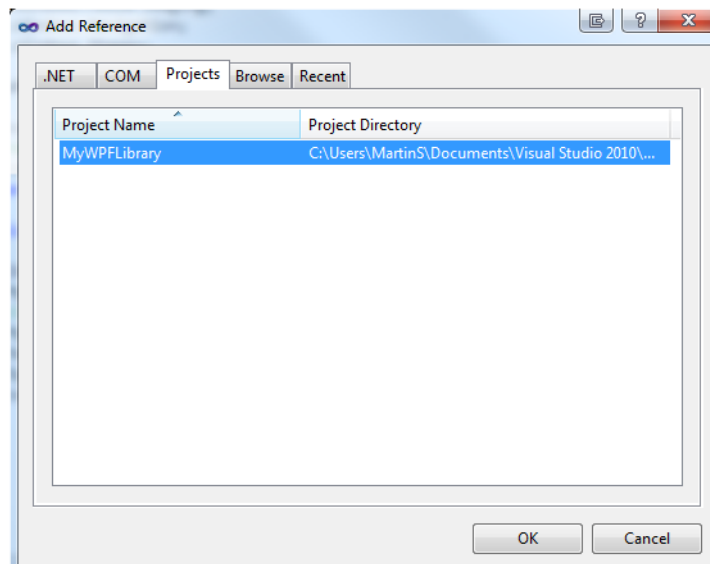
BUILD

Now create the solution Some DLLs are created in the output folder in the process.

You now have a DLL with the necessary functionality available. However zenon can only display XAML files that cannot be linked to the code-behind file. Therefore another DLL is required that references the DLL that has just been built. To do this:

1. Create another project, another WPF user control library.

2. It was called `DataGridControl1` in our example.
3. Insert a reference to the project that has just been built into this new project.



4. The XAML files looks as follows:

```
<UserControl x:Class="test.UserControl1"
    xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
    xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
    xmlns:mc="http://schemas.openxmlformats.org/markup-compatibility/2006"
    xmlns:d="http://schemas.microsoft.com/expression/blend/2008"
    mc:Ignorable="d"
    d:DesignHeight="300" d:DesignWidth="300">
    <Grid>

    </Grid>
</UserControl>
```

5. Because all necessary content is contained in the DLL and no code-behind is necessary, delete:

```
x:Class="test.UserControl1"
```

6. Also delete (for the positioning) the following lines

```
mc:Ignorable="d"
```

```
d:DesignHeight="300" d:DesignWidth="300"
```

7. Define what is to be displayed in the XAML file. To do this, add the following lines:

```
<UserControl xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
    xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
    xmlns:mc="http://schemas.openxmlformats.org/markup-compatibility/2006"
    xmlns:d="http://schemas.microsoft.com/expression/blend/2008"
```

```

xmlns:mywpflib="clr-namespace:MyWPFLibrary;assembly=MyWPFLibrary">

<Grid x:Name="GridName">

<mywpflib:UserControl1 HorizontalAlignment="Left" Name="userControl11"
VerticalAlignment="Top"/>

</Grid>

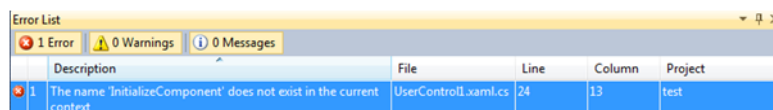
</UserControl>

```

The `xmlns:mywpflib="clr-namespace:MyWPFLibrary;assembly=MyWPFLibrary"` line defines the namespace `mywpflib` and stipulates that this should use the assembly built before.

8. Insert a pre-existing name into the TAGs of the grid.
9. Insert the control `mywpflib:UserControl11` from our library and give it a name, because zenon can only modify objects that have a name.
10. Construct this solution.

This now leads to an error message:



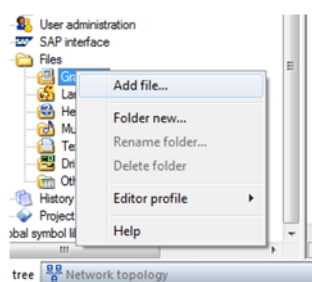
	Description	File	Line	Column	Project
1	The name 'InitializeComponent' does not exist in the current context	UserControl1.xaml.cs	24	13	test

11. To rectify the error, simply delete the code-behind file and carry out a rebuild.

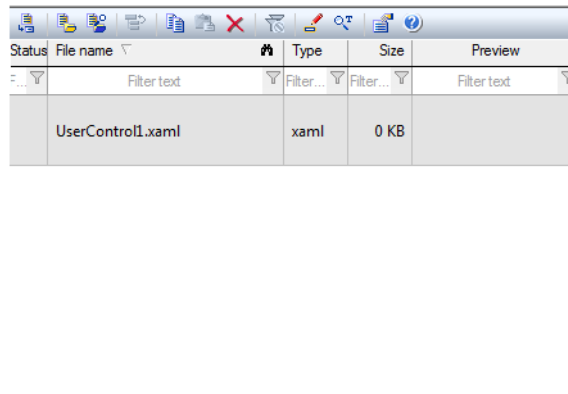
In the next step, the XAML file is added in zenon.

STEPS IN ZENON

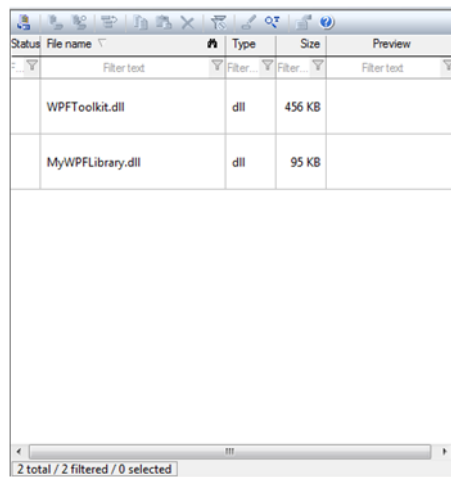
1. Open the zenon Editor
2. Go to File -> Graphics
3. Select **Add file...** in the context menu



4. Select the XAML file from the save location and insert this.

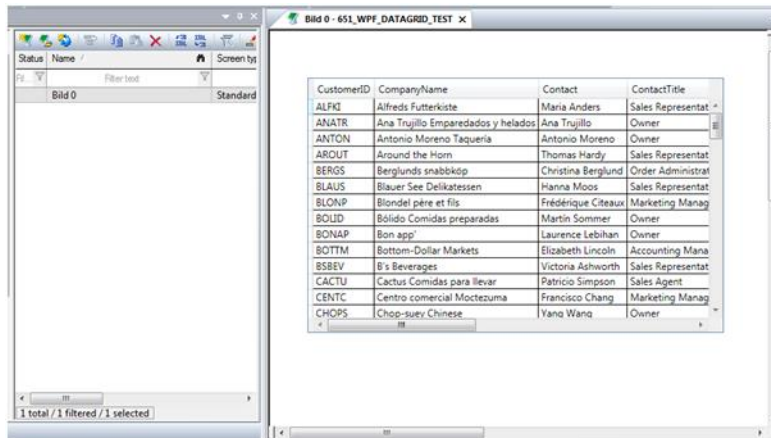


5. Insert the DLLs with the functionality for the XAML file. To do this:
 - a) Select, in the context menu, File -> OtherAdd file...
 - b) Select the WPFToolkit.dll and the DLL of the first project



6. Create a screen.

7. Insert a WPF element and select an XAML file. You should now see the following:



Note: If the XAML file is to be deleted or updated within the zenon project, it may be the case that the DLLs are still open and cannot be deleted from the file folder. The editor must be restarted in order to delete them. It may also be sufficient to deactivate the project and reactivate it again.

Troubleshooting

ENTRIES IN LOG FILES

Entry	Level	Meaning
Xaml file found in %s with different name, using default!	Warning	The name of the collective file and the name of the XAML file contained therein do not correspond. To avoid internal conflicts, the file with the name of the collective file and the suffix <code>.xaml</code> is used.
no preview image found in %s	Warning	The collective file does not contain a valid preview graphic (<code>preview.png</code> or <code>[names of the XAML file].png</code>). Thus no preview can be displayed.
Xaml file in %s not found or not unique!	Errors	The collective file does not contain an XAML file or several files with the suffix <code>.xaml</code> . It cannot be used.
Could not remove old assembly %s	Warning	There is an assembly that is to be replaced with a newer version, but cannot be deleted.
Could not remove old assembly %s	Errors	A new version is available for an assembly in the work folder, but it cannot be copied there. Possible reason: The old example is still loaded, for example. The old version continues to be used, the new version cannot be used,
file exception in %s	Errors	A file error occurred when accessing a collective file.
Generic exception in %s	Errors	A general error occurred when accessing a collective file.

10.29 Numerical value

You display numerical values with the `numerical values` dynamic element.

To create a `numerical value` in a screen:

1. Select the `Numeric value` symbol in the `Elements` tool bar
2. select the start point in the main window
3. pull open the element while pressing and holding the left mouse button
4. the dialog to assign a numerical value (on page 254) opens

5. select the desired variable and define the desired properties in the properties window

 **Info**

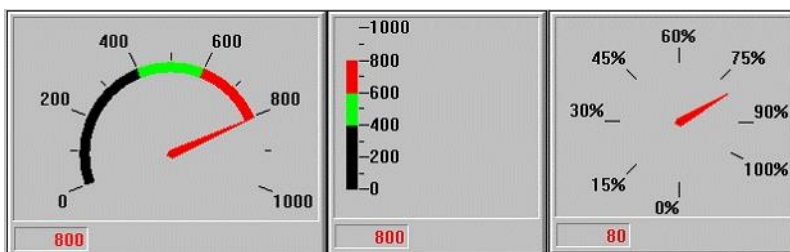
The following applies in runtime: A decimal value can be entered with a comma as well as with a period as a separator. It is always displayed as a period.

10.30 Pointer instrument

You display the indicating instrument with the `indicating instrument` dynamic element.

To create an `indicating instrument` in a screen:

1. select the `Indicating Instrument` symbol in the `Elements` tool bar or in the `Elements` drop-down list
2. select the start point in the main window
3. pull open the element while pressing and holding the left mouse button
4. the dialog to assign a numerical value (on page 254) opens
5. select the desired variable and define the desired properties in the properties window



COLOR-CODED DISPLAY OF THE LIMIT VIOLATION

At limit violations the color from the variable can color the whole area or only the area starting from the limit violation. This functionality is controlled via property `Explicit` in group `Representation`.

This property affects only the display of values with defined limits from variables. Limits from reaction matrices are not considered.

Active: If a limit value of the linked variable is breached, only the part of the display that goes into the limit value breach is shown in the color of the respective limit value.

If the variable has several defined limit values, the corresponding areas of the display are each shown in the color of the limit value.

Inactive: If a limit of the linked variable is violated, the complete display is displayed in the color of the violated limit.

Default: `inactive`

10.31 Status Element

You control a screen symbol with a **Status Element** dynamic element. In doing so, properties of a linked variable such as colors or flashing for example are transferred to a symbol. You can therefore also show statistical limit value texts.

To create the **Status Element** in a screen:

1. select the **Status Element** symbol in the **Elements** tool bar or in the **Elements** drop-down list
2. select the start point in the main window
3. pull open the element while pressing and holding the left mouse button
4. the dialog to assign a variable (on page 254) opens
5. select the desired variable and define the desired properties in the properties window



Information

*Instead of the dynamic element **Status element** the dynamics properties of the according element can be used.*

11. Edit screen elements

There are many possibilities available to you for editing screen elements:

- ▶ Graphic actions (on page 205)
- ▶ Automated replacement (on page 240)
- ▶ Background graphics (on page 252)
- ▶ Selection dialog functions
- ▶ Variables selection dialog (on page 254)

11.1 Graphic actions

Graphic actions are also possible in zenon. To do this, use:

- ▶ Element properties
- ▶ Commands in the Edit menu
- ▶ Actions with the mouse:
 - Holding down the ctrl key when moving the mouse copies the element.
 - Moving with the right mouse button pressed opens the context menu, with a choice of whether to copy or move the item
- ▶ the context menu



Information

Graphic actions such as shading and blurring can have an effect on the performance of the system, both in the editor and in runtime.

ENTERING VALUES

To enter values within a defined limit, there are also sliders for many properties. These can be accessed via the ... button+. Changes in values made with the slider are displayed in the properties field immediately.

When selecting colors, the color activated in the palette is displayed directly in the object as a preview.

11.1.1 Truncations

The elements **Rectangle** (on page 115) and **Button** (on page 45) and **Polygon** (on page 112), **Polyline** (on page 114) and **Tube** (on page 116) can be displayed with truncations.



Information

Truncations are available only with limitations if property `Windows CE projectis` activated or if property `Graphics quality` has value `Windows Base`.

RECTANGLE AND BUTTON

You define the degree of truncation with the properties in `Rounded corners` node. 2 values can be given for each corner point:

- ▶ `X` value: Percentage value for the rounding based on the width of the element
- ▶ `Y`-value: is a percentage value for the rounding based on the height of the element

0% means no rounding.

100 % means a quadrant.

If the `Proportional` property is activated, only the `X` value can be entered.

The values can be defined separately for each angle. If the value of an angle is set at `-1`, it then takes its rounding value from the `All x [%]` or `All y [%]` property.



Information

If the value for `All x [%]` or `All y [%]` is changed, all values are set to `-1` on the corresponding axis. Therefore different values can be re-harmonized very easily.

Hint: There is a small yellow triangle in the lower right quadrant of the element. Click on it with the mouse and move the triangle up to the desired rounding.

Example:



There is a GIF file on the button with a transparent background. A red color gradient was defined for the button. The rounding of the angles was defined with `All x [%]` and `Proportional`, afterwards this value was changed individually for the lower left angle.



Information

If the `With brightness values property` is used for displaying the fill color, no rounded edges can be used. If this element is activated for an element, that uses rounded-off corners, the element is displayed with non-rounded corners.

POLYGON, POLYLINE UND TUBE

You can define the degree of rounding for polygons, polylines and tubes with the `Rounding` property in the `Representation` node. Enter a value between 0 and 1 for this.

11.1.2 Effects for screen elements

Several graphical elements can be highlighted with the help of effects in the Runtime.

You can find additional effects in chapter effects for frames (on page 272).

Glow effect

Many zenon support the glow effect.

REQUIREMENTS

To use glow effect for a graphical element, the following requirements must be fulfilled:

- The project property `Graphical design/Graphics quality` must be set to `DirectX Hardware` or `DirectX Software`. For details see chapter Graphics quality (on page 11).

- ▶ The graphical element must be supported.

Except for the following exceptions all graphical elements are supported: WMF, symbols, combi element, ActiveX, WPF, all Win32 control elements, windows and several special control elements.

- ▶ The element must be visible.

If the element is invisible, the glow effect is invisible automatically as it is derived directly from the element.

CONFIGURATION

To configure the glow effect for a supported element:

1. make sure that property `Graphics quality` is set to `DirectX Hardware` or `DirectX Software`
2. create the element
3. go to property node `Effects`
4. activate the `Activate` property in the `Glow (only DirectX)` node
5. configure transparency, color, spread and visibility

If you configure several properties for the same effect, the stronger is executed in the Runtime. For details, see `Dependance of the configuration` section. (For example: An invisible glow effect is always invisible; the settings for flashing has no effect anymore.)

Default value for the glow effect:

- ▶ `Activate:inactive`
- ▶ `Only active if clicked:inactive`
- ▶ `Transparency [%]:20 %`
- ▶ `Spread [pixel]:15 Pixel`
- ▶ `Coloring:inactive`
- ▶ `Color:#FFFF90 (yellow)`
- ▶ `Variable for color:None`
- ▶ `Variable for visibility:None`

- ▶ Take over visibility from limit:inactive
- ▶ Visible from:0
- ▶ Visible to:0
- ▶ Variable for flashing:None
- ▶ Take over flash color from limit:inactive
- ▶ Make 2. flash state invisible:inactive

DEPENDENCIES OF THE CONFIGURATION

VARIABLE FOR VISIBILITY

Visibility has especially strong effects. If the glow effect is set to invisible, flashing and color is ignored.

Dependencies:

1. Variable for visibility is linked and Take over visibility from limit is active:
 - Invisible in the limit is activated: Glow effect is invisible.
 - Invisible in the limit is not activated:
The glow effect configured in the properties is displayed. Dependent of the settings the glow effect can also flash.
2. Variable for visibility is linked and Take over visibility from limit is not active:
 - The variable value lies within the limits of properties of Visible from and Visible to:
The glow effect configured in the properties is displayed. Dependent of the settings the glow effect can also flash.
 - The variable value lies outside the limits of properties of Visible from and Visible to:
Glow effect is invisible
3. Variable for visibility is not linked:
The glow effect configured in the properties is displayed. Dependent of the settings the glow effect can also flash.

VARIABLE FOR FLASHING

For all states for which the originally configured glow effect is displayed, you get the glow effect which is configured in the properties. At this for example the color for a limit can come from an own variable; for details see **Color from variable**.

1. `Variable for flashing is linked, Take over flash color from limit is active and Make 2. flash state invisible is active:`
 - Limit was violated:
Glow effect flashes and alternates between colored glow effect (from limit violation) and the originally configured glow effect.
 - Limit was not violated:
Glow effect does not flash and the glow effect is displayed as it was originally configured.
2. `Variable for flashing is linked, Take over flash color from limit is active and Make 2. flash state invisible is not active:`
 - Limit violation is active:
Glow effect flashes and alternates between colored glow effect (from limit violation) and no glow effect.
 - Limit violation is not active:
Glow effect does not flash and the glow effect is displayed as it was originally configured.
3. `Variable for flashing is linked and Take over flash color from limit is not active:`
 - Limit violation is active:
Glow effect flashes and alternates between originally configured glow effect and no glow effect.
 - Limit violation is not active:
Glow effect does not flash and the glow effect is displayed as it was originally configured.
4. `Variable for flashing is not:`
Glow effect can be displayed dependent on other properties.

COLOR FROM VARIABLE:

Represents the possibility to define the color of the glow effect at normal view via the limit of a variable. This is also true for the normal view when the glow effect does not flash.

1. Variable for color linked:
 - a) Limit violation is active:
The color from the violated limit is used.
 - b) Limit violation is not active:
For coloring the glow effect the defined color from property `Color` is used.
2. Variable for color not linked:
For coloring the glow effect the defined color from property `Color` is used.

COLORING:

Defines whether the glow effect is created as image of the actual element or whether it is colored with a single color.

1. Coloring active and Variable for color linked:
 - a) Limit violation is active:
For coloring the glow effect the color from the violated limit is used.
 - b) Limit violation is not active:
For coloring the glow effect the defined color from property `Color` is used.
2. Coloring active and Variable for color not linked:
For coloring the glow effect the defined color from property `Color` is used.
3. Coloring not active: An image of the actual element with all corresponding colors of the element for the glow effect is used.

HINTS FOR CONFIGURATION

To receive good results:

- ▶ Select a rather lower value for `Transparency [%]`. Without coloring the value may be a little bit higher than with coloring.
- ▶ Do not select a too small value for `Spread [pixel]`. It should be >5 for the effect to be visible outside of the element.

Attention: Too high values (>20) can lead to the glow effect being reduced very much. In this case the visibility can be increased by reducing the transparency. In general the glow effect needs a lot of performance. Thus you should use it consider it well when and where to use it. A higher value for `Spread [pixel]` costs more performance which especially affects elements which lie close together.

- As for DirectX the glow effect (just like the shadow) is derived from the original element, dynamic changes of the element affect the effect. In addition bitmap graphics can be equipped with this effect. Thus for example a PNG graphic with semi-transparent areas as well as a GIF animation obtain a correct glow effect which is created dynamically during the display. The glow effect just as the shadow also affects text by which correlating effects can be achieved.

Examples for glow effects

GLOW EFFECT

Element without glow effect:



Element with glow effect:



COLORS

Default color 0xFFFF90 (yellow):



Color 0xFFFFFFFF (white):



TRANSPARENCY

0% transparency:



20% transparency:



60% transparency:



SPREAD

0 pixel spread and 0% transparency:



5 pixel spread and 0% transparency:



10 pixel spread and 0% transparency:



20 pixel spread and 0% transparency:



Color 0xFFFF90, 5 pixel spread and 20% transparency:



Color 0xFFFF90, 20 pixel spread and 20% transparency:



TEXTS

5 pixel spread and 0% transparency:

Text

Color 0xFF0000, 5 pixel spread and 0% transparency:

Text

Large font with 15 pixel spread and 0% transparency:

Text

Large font with color 0xFF0000, 35 pixel spread and 20% transparency:

Text

PART-TRANSPARENT GRAPHIC

Original:



20 pixel spread and 20% transparency:



Color 0xFF0000, 20 pixel spread and 20% transparency:



Without color, 20 pixel spread and 20% transparency plus shadow with 40 pixel distance, 60% transparency, black and 5 pixel soft focus.



ELEMENT CHANGES

3D button in contrast colors, 15 pixel spread and 0% transparency on 3D button:



3D button in contrast colors, pressed with 15 pixel spread and 0% transparency on 3D button:



Troubleshooting

OUTPUT

Entry	Level	Description
DirectX: Screen 'Screen name' - Element 'Element name' uses an effect which cannot be displayed with the selected graphics setting.	Warning	At an element the glow effect is activated. However DirectX Software or DirectX Hardware is not selected or not available.

CHECK LIST FOR ERROR LOCALIZING

- ▶ Is DirectX turned on?
- ▶ Is DirectX available on the system? An according check can be carried out by activating the debug messages in the Diagnosis Viewer. For successful support, an appropriate message is displayed.
- ▶ Does the element support the glow effect?
- ▶ Is the element visible?
- ▶ Cause static properties (e.g. transparency) the glow effect not to be displayed or displayed differently?
- ▶ Cause dynamic properties the glow effect not to be displayed or displayed differently?

- ▶ Is a property selected which causes the glow effect only under certain circumstances (e.g. button element with property "Only active if pressed")?

Frame and Shadows

Elements can be expanded with frames and shadows.

Exception: `Status` elements cannot obtain shadows.



Information

If the transparency of an object (for example the background color) is changed, the display of the preconfigured shading also changes accordingly. The values for colors and transparencies of shading remain the same in the process.

ALLOCATE FRAME AND SHADOWS

- ▶ To give an element a frame, select `Frame` in the property `Border` type node `Borders/Shadows`.
- ▶ To give an element a frame, select `Frame` in the property `Border` type node `Borders/Shadows`.

FOR SHADOWS AND FRAMES, YOU CAN DEFINE

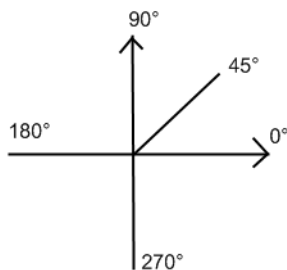
- ▶ Distance: distance of the frame or shadow to the element.
- ▶ Frame color: Color of frame or shadow.

FOR FRAMES, YOU CAN DEFINE

- ▶ Line width: The width of the frame.

FOR SHADOWS, YOU CAN DEFINE

- ▶ **Angle:** The angle in degrees with which the shadow falls, starting from the outside right counterclockwise.



- ▶ **Transparency:** Transparency of the shadow between 0 and 100%, with 0% being opaque and 100% being transparent.
- ▶ **Size of shadow:** Size of shadow in pixels.
- ▶ **Blurring:** Blurs the surface color and makes the transition to shadow softer.

Note: if a value is irregularly set to 0 here, then the calculation affects system performance.



Information

Transparency for lines or fill colors of an element have an effect on the shadow. For example: If the fill color is set to 100% transparent, then no shade will be visible for the fill area.

PARTICULAR FEATURES FOR TEXT

The shadow display for text with a background in the Editor and Runtime depends on the configuration and graphics settings.

Text with transparent background:

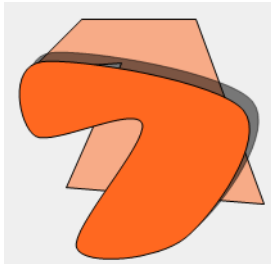
- ▶ **Editor:** No shadow display,
- ▶ **Runtime Graphics quality**
 - **Windows extended:** No shadow display
 - **DirectX:** Text casts shadows

Text with background filled:

- Editor and Runtime, Graphics quality Windows extended or DirectX: Shadow is displayed (rectangle)

Examples

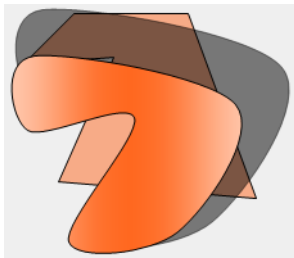
Shade with an angle of 45 degrees moved by 10 pixels



Shade with an angle of 45 degrees moved by 30 pixels



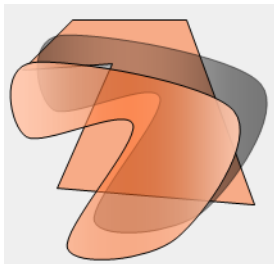
Shade with size of 30 pixels



Shade with size of -20 pixels



Shade with a size of -20 pixels and transparent color gradient in the element



Rounded rectangle with a blur of 10



11.1.3 Move elements

To move elements, use:

FROM VERSION 6.50

the properties from the respective element:

- ▶ Position
- ▶ Size and rotation dynamic

You can also animate elements with properties

- ▶ Colors dynamic in the `nodeColor`
- ▶ Flashing in the `nodeVisibility/flushing`
- ▶ Visibility in the `nodeVisibility/flushing`

UP TO AND INCLUDING VERSION 6.22 AND RUNTIME COMPATIBILITY

- ▶ Alternatively, you can also use the Move Symbol (on page 120) dynamic element

11.1.4 Color gradient and transparency

Elements can be given color gradients or switched to transparent.

To do this, select the corresponding element properties in the `Color` node:

COLOR GRADIENT

Color gradients can be set in the following direction for the following elements:

Element	Linear	Defined point	Define point with beams
Rectangle	Yes	Yes	Yes
Circle	Yes	Yes	No
Segment of a circle	Yes	Yes	No
Polygon	Yes	Yes	Yes
Button	Yes	Yes	Yes

To define a color gradient, select `Color Gradient` as a `Filling pattern`.

You can now define the color gradient via the properties of the group `Color gradient`. You can also define the color gradient with the mouse. To do this, click on the yellow circle in the element with (connecting line to the middle point) and move the circle until you reach the desired gradient.



Information

Right angles are positioned horizontally at angles between 45° and 135° and between 225° and 315°.

The `With brightness values` property is not available for polygons.

COLOR GRADIENT UNDER WINDOW CE OR FOR GRAPHICS QUALITY WINDOWS BASIS

Under Windows CE or for settings `Windows Basis` for property `Graphics quality`, color gradients for vector elements can only be accomplished via brightness values. The `Color gradient` property is not available. For the display of color gradients use property:

- ▶ Offset [%]: only works for element rectangle
- ▶ Angle [°]: only works for element rectangle
- ▶ Brightness outside
- ▶ Brightness inside

Note:

Property With brightness values need not extra be activated.

Property Angle [°] can only be changed in steps of 90° under Windows CE and at setting Windows Basis for property Graphics quality.

BUTTON

For element button under Windows CE and Windows Basis the following is also true:

- ▶ For property Filling the values Starting from a defined point and Starting from a defined point with beams are not available.
- ▶ The Angle [°] property is not available.

TRANSPARENCY

You can switch an element to be completely transparent with the Transparent property.

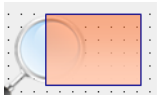
To switch elements to be partially transparent, use the properties for fill color transparency, gradient color and frame color. Here, you define the covering power of the colors with values between 0 and 100 percent. In doing so, 0 is opaque and 100 is completely transparent. All values between this appear transparent according to how they are set.

EXAMPLES

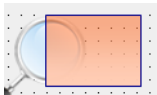
Transparency: fill color = 100, fill color 2 = 100



Transparency: fill color = 50, fill color 2 = 100



Transparency: fill color = 0, fill color 2 = 100



Information

Control elements to control list fields such as screen scroll bars do not support transparency.

11.1.5 Transfer format

To transfer the properties of a selected element to another one / multiple elements:

1. Transfer to an element:
 - a) Click on element with original properties -
 - b) Click on the **Transfer properties** symbol or the corresponding command in the context menu
 - c) Click on target element: Properties are transferred
2. Transfer to multiple elements:
 - a) Select source element -
 - b) Select target element with Ctrl key held down (source and target elements are highlighted)
 - c) Click on the **Transfer properties** symbol or the corresponding command in the context menu
 - d) The source element's properties are transferred to the target elements.

If several elements were chosen as source, the properties of the first selected element are transferred.



Information

Accept properties via properties window:

If several elements are highlighted, the properties of the last respective highlighted element in the properties input is displayed. If the properties window is displayed in the **Grouped view** mode or in the **All properties mode** mode, the respective property can be transferred to all highlighted elements by pressing the **Return** key. This is not possible in the **dialog view** mode. For details, see the Properties window chapter, **Multiselect** section.

RULES FOR TRANSFERRING FORMATS

TRANSFERRED ARE:

- ▶ Properties that directly define an element in form, color, and appearance and are not influenced by a variable.

NOT TRANSFERRED ARE:_

- ▶ Deactivated properties
- ▶ Direct properties that it does not make sense to transfer, such as texts and Graphics files

Exception:

- Graphics files for a switch are copied as you normally always want to have the same switches.
- Graphics files for buttons are not copied as different ones are normally used.
- ▶ Properties from groups:
 - Authorization
 - Automatic Line Coloring
 - General
 - Position
 - Size and rotation dynamic
 - Runtime
 - VBA macros
 - Write set value

- ▶ Everything that comes directly from variables
- ▶ Variables and linked functions

11.1.6 Copy, Insert and Move

To copy, move or delete elements on a screen, use

- ▶ Commands in the **Edit** menu
- ▶ Actions with the mouse:

Holding down the **Ctrl** key when moving the mouse copies the element.

Moving with the right mouse button pressed opens the context menu, with a choice of whether to copy or move the item

- ▶ the context menu

MOVE

Objects can be moved with the mouse or the keyboard, with the exception of frames. You can use special effects in combination with function keys when moving:

Key	Action	Result
Ctrl	move with mouse	object is copied.
Shift	move with mouse	object can only be moved horizontally and vertically.
Shift	move with arrows	Each key press moves the object by 10 pixels.
Right mouse button	move with mouse	The context menu lets you choose between Copy and Move.
Space bar		Mouse pointer becomes a hand. With this hand, the editing area can be moved with the left mouse button.

11.1.7 Designing lists

The display of certain lists can be modified in Runtime. Not all configuration options are available for all lists. The configuration can differ depending on the screen type; for example, headers for Batch Control can be configured with different properties as those for AML. Most of all, list elements for AML, Batch Control, CEL, ETM, Report Viewer or RGM have various design options.

For example, the following are available:

- ▶ General display (on page 227)
- ▶ Headers and scroll bars (on page 228)
- ▶ Graphic for checkbox (on page 230)

Representation

In the `Representation` area, the font and line height can be configured and the `Extended graphical settings` property can be activated.

FONT

Select the font to be used for the list using the `Font` property. Click on the ... button to open the dialog to select a font. You can configure the fonts offered here in the `Screens/font lists` (on page 289) node.

LINE HEIGHT

You can define the line height regardless of the font size with the `Line height [pixel]` property.



Attention

EXTENDED GRAPHICAL SETTINGS

This property allows you to use customizable horizontal and vertical scroll bars, the header and the grid.

PREVIEW

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

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

Headers and scroll bars

Headers allow, in Runtime:

- ▶ Columns to be moved
- ▶ The size to be changed
- ▶ The sorting to be changed.

Headers are generally configured in the `Representation/Header` area. Headers for AML and CEL differ from this; for details, see the section entitled **Headers for AML and CEL**.

HEADERS GENERAL

To be able to use headers in Runtime, activate the `Show header` property.

You fix the header with the `Static header` property. It can then no longer be changed in Runtime. Only the column width can still be changed.

To activate the filter line in Runtime, activate the `Display filter line` property.

Note: Pre-configured filters are also executed if the filter line is not displayed.

You define the height of the header using the `ID_GFXRT_HEADERHEIGHT` property. The height is automatically determined on the basis of the font if the value is 0. The maximum height is 255 pixels.

HEADER FOR AML AND CEL

To use headers in AML or CEL screens:

1. navigate to `Group Alarm Message List` in project properties

2. In the `Header AML` property, select the value `Operable header` (alternatively you can also switch the header to `inoperable` or `invisible` here)



Information

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

SORT IN THE RUNTIME

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

1. Select the `Graphics files` for the `Display style` property
2. link properties `Sort ascending` and `Sort descending` each with a graphics file
3. in the Runtime the selected graphic for the corresponding sorting order is displayed in the column which is relevant for the sorting
4. Click on the graphic in order to change the sorting order
5. Clicking in the column title activates the column for sorting

CONFIGURING THE APPEARANCE FOR SCROLL BARS AND GRID

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

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`

You can find information on the individual properties in the embedded help.



Information

If you select `Graphics files` for property `Display style`, all elements for which no graphics file is selected are displayed with color gradient. Transparent graphics cannot be used for control elements for lists.

Grafic for check box

Checkboxes with graphics can be designed individually. To do this, assign the desired graphics to the corresponding properties in the Editor. The graphics must already be created in the **Files\graphics** node. The defined graphics are drawn in Runtime with the aspect ratio being taken into account.

You define which graphics file is used for the status of a check box with the properties in the **Representation group**:

- ▶ **On**: The check box is switched on (activated).
- ▶ **On (inactive)**: The check box is switched on (activated) and cannot be changed.
- ▶ **Off**: The check box is switched off.
- ▶ **Off (inactive)**: The check box is switched off and cannot be changed.

11.1.8 Add and delete dots

ADD AND DELETE DOTS FOR POLYLINES (ON PAGE 114), POLYGONS (ON PAGE 206) AND TUBES (ON PAGE 116):

ADDING CORNERS:

To add corners (corner points):

- ▶ move the mouse cursor to a line of the polygon:
- ▶ right-click
- ▶ select menu item **Adding a node in the selected element** from the context menu

or:

- ▶ press **Ctrl** and **Shift** simultaneously
- ▶ move the mouse cursor to a line of the polygon:
- ▶ the mouse cursor changes to an arrow with a plus-symbol
- ▶ left-click in order to add a corner

REMOVING CORNERS:

- ▶ move the mouse cursor to a corner of the polygon:
- ▶ right-click
- ▶ select menu item `Deleting the node in the selected element` from the context menu

or:

- ▶ press `Ctrl` and `Shift` simultaneously
- ▶ move the mouse cursor to a corner of the polygon:
- ▶ the mouse cursor changes to an arrow with a plus-symbol
- ▶ left-click to delete the corner

11.1.9 Arrows in vector elements

A symbol for the start and end of a line can be defined for all vector elements that display open figures. This applies for:

- ▶ Line
- ▶ Polyline
- ▶ Unfilled arc of a circle
- ▶ Unfilled segment of a circle

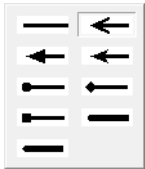
To add a symbol:

1. ensure that the `Graphics quality property (Screens node)` is activated
2. draw the element
3. In properties, in the `End of line` group, select the properties for:
 - a) `Start type`: Symbol for start of line.
 - b) `End type`: Symbol for end of line.

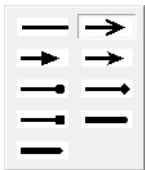
- c) **Size**: enlargement factor for line width. The factor relates to the line width of the vector element as defined in the `Line width [Pixel]` property. Default = 0

The following symbols are available:

from left or to the left:



from the right or to the right:



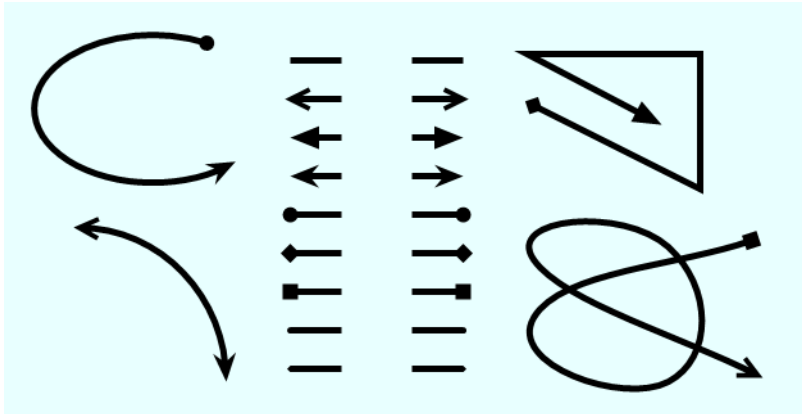
Information

These elements are not available:

- ▶ under Windows CE, because `Graphics quality` must be activated
- ▶ with a filled circle segment
- ▶ with a filled arc of a circle

Example for arrows

Vector elements with start and end symbols with an enlargement factor of 1.5:



11.1.10 Grid

The grid makes it possible to align elements precisely on the screen.

The basic settings are in the **Options/Settings** menu:

<u>Grid settings</u>	
Display grid	Active: Shows the grid that can be defined in the main window under Grid type. Inactive: Grid is not displayed.
Position in grid	Active: Screen elements are automatically aligned with the grid. This function is independent from the option Display grid.
Grid color	Defines the grid color. The windows color palette is used for selection.
Grid type	Defines the type of grid: solid, dotted or intersections.
Grid pitch [in pixels]	Defines the horizontal and vertical distance between unique marker points. Therefore, it also defines how finely scaled element sized can be displayed. Recommended grid distance: 10 pixels horizontally and vertically.

IN THE PICTURE CONTEXT MENU, YOU DECIDE

Menu entry	Description
Display grid	Switch grid to visible or invisible.
Use grid	Elements are aligned in the grid.
Use magnetic points	Touch points of objects move into place when neared and align themselves to each other.



Information

If grid points are 5 pixels or less, only the grid lines that are more than 5 pixels apart are displayed. The smaller grid lines are also used for the positioning.

11.1.11 Font

A default font is automatically created when creating a project. This is provided as the standard font for new objects. The default font cannot be deleted. If you require other fonts:

- ▶ create the desired font in the Fonts node (subnode of Screens)
- ▶ select the font in the object properties (node Representation, property Font)

11.1.12 Selecting

Objects are selected by clicking the mouse. To select several objects:

- ▶ When clicking, hold down the `shift` or `ctrl` key
or
- ▶ drag a connection rectangle with the mouse

To deselect an object when more than one object are selected at the same time, click it with the `ctrl` key held down.

CHANGE THE SEQUENCE OF SELECTION

If objects are to be aligned to each other, the first object selected serves as a reference. You recognize the reference object by the fully-filled touch points. To make another object the reference object:

1. hold down the `shift` key
2. click on the object that is to serve as the reference object with the mouse

ALIGNING A SELECTED OBJECT

You can find more information on aligning objects in the chapters on Editor/Tool Bar/Alignment and Editor/Menu Bar/Edit

11.1.13 Scale, center and zoom

SCALING

This you can scale elements in two ways:

1. proportional: Hold down the `shift` key when scaling
2. around the center: hold down the `shift` key to do this

Note: If an angle dissimilar to 0 via property `Rotation angle [°]` was defined for an element, scaling via arrow keys is not possible.



Information

Scaling of symbols:

*If the symbol contains a **static text** element and is embedded in this element as text, then this text:*

- ▶ Is scaled in the Editor
- ▶ Is not scaled in Runtime

This only applies to symbols. Embedded text is neither scaled in the Editor nor in Runtime in all arrangements.

CENTER

The currently selected element can be centered in the editing window with the **H** key.

ZOOMING

You can read information on zooming screens in the Screens toolbar chapter (manual: Editor).

11.1.14 Keyboard shortcuts

Shortcuts for the graphic editor:

Note for shortcuts: The plus sign (+) means that keys are pressed together.
For example:

Ctrl+A means: Hold key **Ctrl** and then press key **A**.

Ctrl++ means hold key **Ctrl** and press key **+**.

GENERAL

Command	Key combination
Main window: Scroll content with 'moving hand'	Press and hold <code>Space</code>
Close current screen	<code>Ctrl+F4</code>
Open properties	<code>Alt+Return</code>

SELECT

Command	Key combination
Select several objects	Press <code>Shift</code> or <code>Ctrl</code>
Deselect selected object during multi-select	<code>Ctrl</code> +mouse click
Selection: Change sort order. Defines the element on which all others realign	Press <code>Shift</code> during selection
Select hidden objects	<ol style="list-style-type: none"> 1. Press <code>Alt</code> 2. Click object and move it
Select all elements of a screen.	<code>Ctrl+A</code>
Select next element according to the order of their creation	<code>Tab</code>
Select previous element according to the order of their creation	<code>Shift+Tab</code>

POSITIONING

Command	Key combination
Move selected object.	Cursor keys
Move by 10 pixels each time you press a cursor key	<code>Shift</code> +arrow keys
Move only horizontally or only vertically	Press <code>Shift</code> during moving
Centers the selected object in the working section	<code>H</code>

ACTIONS

Command	Key combination
Saves changes	Ctrl+S
Pastes element from the clipboard	Ctrl+V Shift+Ins
Inserts element from the clipboard at its original position; original and copy lie congruently on top of each user	Ctrl+Shift+V
Copies selected element.	Ctrl+C Ctrl+Ins
Copy instead of move	Press Ctrl during moving
Deletes selected element	Del
Cuts out the selected element	Shift+Del Ctrl+X
Undoes changes	Ctrl+Z Alt+Backspace
Add or delete node in the selected element. Add: Mouse cursor turns to plus symbol (+). Delete: Mouse cursor turns to minus symbol (-). Works for polylines, polygons and pipe elements.	Ctrl+Shift
Cancel drawing of polylines and polygons	S
Cancel drawing of polylines and polygons and delete the section which was drawn last	Esc
Move selected elements one level up	+
Move selected elements one level down	-
Move selected elements to the foreground	Ctrl++
Move selected elements to the background	Ctrl+-

SCALING

Command	Key combination
---------	-----------------

Change size	<p>Move mouse cursor to the handle so that the mouse cursor changes to an arrow. After that you can position accurate to the last pixel with the help of the Cursor keys or in steps of 10 pixels with the help of the Cursor keys+Shift.</p> <p>Note: If an angel dissimilar to 0 via property Rotation angle [°] was defined for an element, scaling via arrow keys is not possible.</p>
Scaling object around the center	Press Alt during scaling.
Proportional scaling	Press Shift during scaling

11.1.15 Assign a key to a control element

Operable elements in a screen can be linked using a key combination and operated in this way. This applies, for example, to:

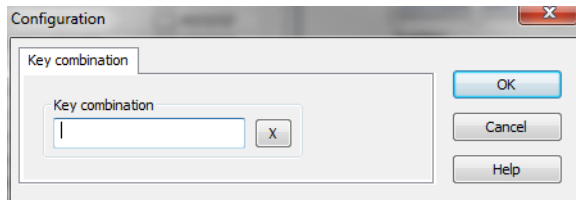
- ▶ Execution of control elements and assigned functions such as print, move screen, etc.
- ▶ Send value (such as with switch)
- ▶ Set focus of certain windows (such as curve list in Extended Trend or Comboboxes in the Recipe Group Manager)

The element control function can be carried out with the keyboard in Runtime.

To assign a key to a control element:

1. Highlight the control element
2. Navigate to the **Key combination property (object properties -> Runtime -> Keyboard operation)**
3. Click on the **...** button or in the input field

4. The dialog for defining the key combination is opened



Parameters	Description
Key combination	Input of the key combination. Click in the field and press the desired key or key combination, for example: A. The key combination is displayed in the input field.
X	Deletes the character sequence in the input field.
OK	Accepts key combination and closes dialog.
Cancel	Discards input/change and closes dialog.
Help	Opens online help.

11.2 Replacing linking of variables and functions

If several variables or functions are to be replaced at the same time, it is best if you use automatic replacement for:

- ▶ Replacing linking in the Editor screen (on page 242)
- ▶ Replacing linking with screen switching (on page 244)
- ▶ Replacing indexes (on page 248)
- ▶ Linked symbols (on page 316)

You can also read about automated replacement for configuration in the **Efficient configuration with zenon** manual in the **Reusing elements** section.

11.2.1 Naming conventions

To be able to replace variables and other elements securely, the naming should be systematic and standardized if possible. You therefore support not only the reusability, but also maintenance and reverse engineering.

Different systems support you with systematic naming.

FOR EXAMPLE: ENERGY INDUSTRY

Germany

- ▶ KKS (Kraftwerk-Kennzeichen-System - Power Plant Classification System), for details (in German), see <http://de.wikipedia.org/wiki/Kraftwerk-Kennzeichensystem> (<http://de.wikipedia.org/wiki/Kraftwerk-Kennzeichensystem>)
- ▶ DIN 6779 (Kennzeichnungssystematik für technische Produkte und technische Produktdokumentation - Classification System for Technical Products and Technical Product Documentation), for details (in German), see http://de.wikipedia.org/wiki/DIN_6779 (http://de.wikipedia.org/wiki/DIN_6779)
- ▶ AKZ (Anlagenkennzeichnungssystem - Equipment Classification System), for details (in German), see <http://de.wikipedia.org/wiki/Anlagenkennzeichnungssystem> (<http://de.wikipedia.org/wiki/Anlagenkennzeichnungssystem>)

International

- ▶ KKS (Power Plant Classification System), for details, see http://en.wikipedia.org/wiki/KKS_Power_Plant_Classification_System (http://en.wikipedia.org/wiki/KKS_Power_Plant_Classification_System)

Such standards exist for all industries. It is recommended that their naming convention is used.

POWER PLANT CLASSIFICATION SYSTEM EXAMPLE:

Variables are to be named in accordance with the KKS in an energy project. A corresponding variable with the label `c01_MDY10-QA001_QA07` indicates:

- ▶ Wind energy equipment `c01` (row C, no. 1)
- ▶ Wind turbine control `MDY10`, Power part `QA001`,

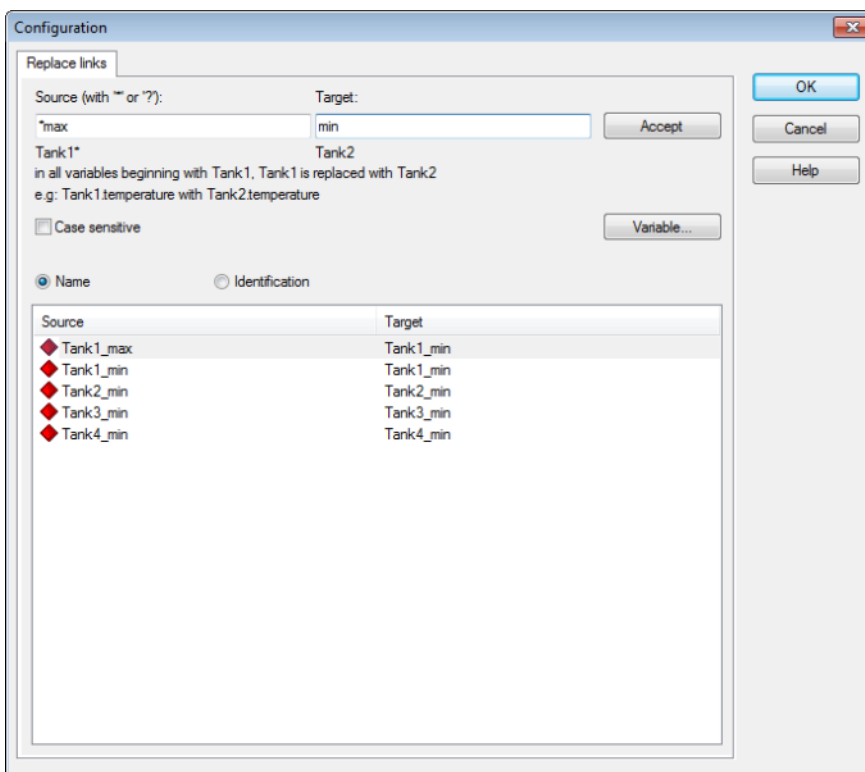
- Power protection QA07

11.2.2 Replacing linking in the Editor screen

Linked variables or functions can be permanently replaced in the Editor in a rule-based manner. The replacement is not limited to the functions or variables defined in the properties of the `Variable / function` group. All other variables used the screen can, such as variables for `Visibility`, `Flashing`, `Size` and `rotation dynamic` and others.

To replace variables or functions in a rule-based manner in the element directly:

1. Highlight the desired element and open it by right clicking the element in the context menu
2. select **Replace Links**
3. The dialog for the replacement of links opens



Property	Description
Source	Enter the partial string to be searched for. Place holder * and ? can be used. Placeholders are only permitted as prefix or suffix; e.g. *xxx or xxx*.
Objective	Entry of the partial string
Name	Swaps information in process variable names.
Identification	Exchanges information in the identification
Note capitalization	When swapping, be sure that any capitalization is an exact match.
Accept	Swaps target strings from the <code>source</code> for those defined in the <code>target</code> .
Variable/function	Opens the selection list for variables/functions in relation to the selected line in the list. Clicking on the variable in the list defines new target variables. Alternative: Double-click on the source variable in question.

REPLACE

A) REPLACE BY MANUAL SELECTION

- ▶ select the element from the list that you would like as the source
- ▶ select a target element via the `variable/function` button
- ▶ the previous element is replaced by the new one

B) AUTOMATED REPLACEMENT WITH RULES

- ▶ In the source input field, define the parameters for the element that you wish to replace
- ▶ define the parameter for the new variable/function in the target input field
- ▶ specify what is to be replaced via Name/Identification
- ▶ Click on `Accept`

**Information**

The target variable or target function can also be in a different project as the source variable or source function. In doing so, all projects concerned must be started and available on the same computer in Runtime.

**Attention**

When replacing variables, be aware of the type and signal resolution. If you replace a variable with one of an incompatible type, this can lead to errors during execution. You will be warned when making the substitution; the substitution will however be carried out.

**Information**

Replace via Drag&Drop: Elements that can only contain one variable or function can be swapped by dragging & dropping. Drag the new variable or function to the element using the mouse. It automatically replaces the previous one.

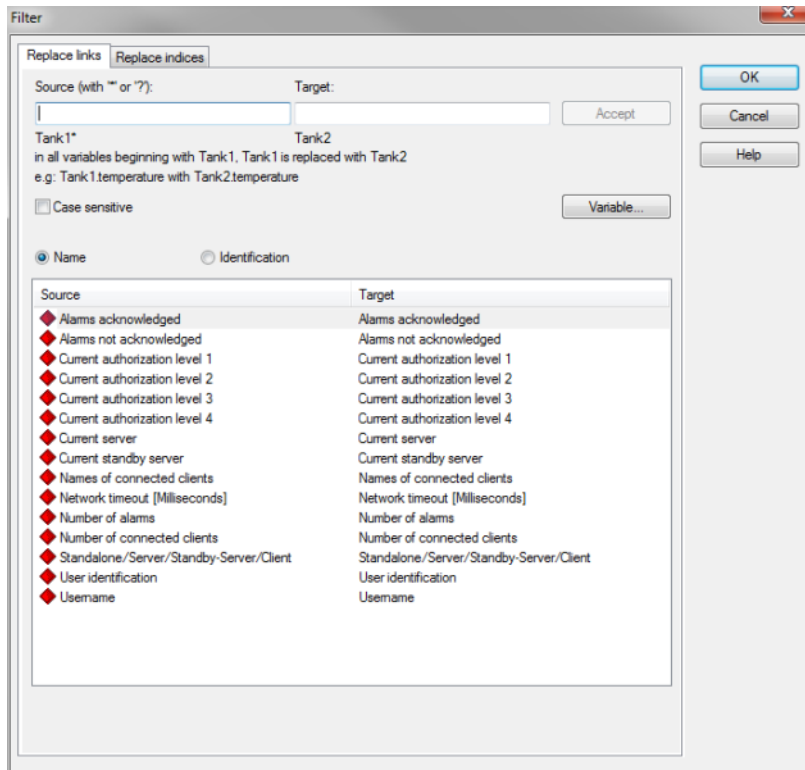
11.2.3 Replacing linking with screen switching

Linked variables or functions in one or more elements, as well as Alias in the ALC can be replaced with screen switching. In doing so, the elements in the screen are not replaced on a lasting basis, but the screen switching is linked in Runtime.

To replace linking when screen switching:

1. Configure a screen switching function
2. Contains elements that can be replaced in the screen, the dialog for replacement is opened

3. Assign the function to a button in order to be able to execute screen switching in Runtime



Property	Description
Source	Enter the partial string to be searched for. Place holder * and ? can be used. Placeholders are only permitted as prefix or suffix; e.g. *xxx or xxx*.
Objective	Entry of the partial string
Name	Swaps information in process variable names.
Identification	Exchanges information in the identification
Note capitalization	When swapping, be sure that any capitalization is an exact match.
Accept	Swaps target strings from the <code>source</code> for those defined in the <code>target</code> .
Variable/function	Opens the selection list for variables/functions in relation to the selected line in the list. Clicking on the variable in the list defines new target variables. Alternative: Double-click on the source variable in question.

REPLACE

A) REPLACE BY MANUAL SELECTION

- ▶ select the element from the list that you would like as the source
- ▶ select a target element via the `variable/function` button
- ▶ the previous element is replaced by the new one

B) AUTOMATED REPLACEMENT WITH RULES

- ▶ In the source input field, define the parameters for the element that you wish to replace
- ▶ define the parameter for the new variable/function in the target input field
- ▶ specify what is to be replaced via Name/Identification
- ▶ Click on **Accept**



Information

The target variable or target function can also be in a different project as the source variable or source function. In doing so, all projects concerned must be started and available on the same computer in Runtime.



Attention

When replacing variables, be aware of the type and signal resolution. If you replace a variable with one of an incompatible type, this can lead to errors during execution. You will be warned when making the substitution; the substitution will however be carried out.

REPLACING INTERLOCKINGS

In the dialog, the variables of the interlockings used in this screen appear next to the variables directly linked to the screen. This also includes the result variable of an interlocking. If a variable was linked to both the elements of a screen and with interlockings of a screen, they only appear once in the dialog.

The variables to be replaced for all interlockings that use these variables are replaced in Runtime. In addition to the variables normally linked to interlocking, the result variables linked to the interlocking are replaced for the screen.

REPLACEMENT IN INTEGRATION PROJECTS

If variables or functions are replaced between a subproject and the integration project, it must be ensured that all projects involved in Runtime are available and started on the computer.



Example

Screen switching to a screen of the subproject is configured in the subproject. In doing so, the variable **variable1** of the subproject is replaced by the variable **variable2** of the integration project. In order for this replacement to be carried out in Runtime, the integration project must be the start project.

If the subproject is the start project, the **variable2** variable of the integration project is not available. No replacement is carried out and the original **variable1** variable of the subproject is used.

The user is not informed that the replacement was not successful in Runtime.

11.2.4 Replacing indexes

When switching screens in Runtime, variables can be replaced dynamically (virtually) using indexing rules. In doing so, variable values can be used as part of the replacement rule.



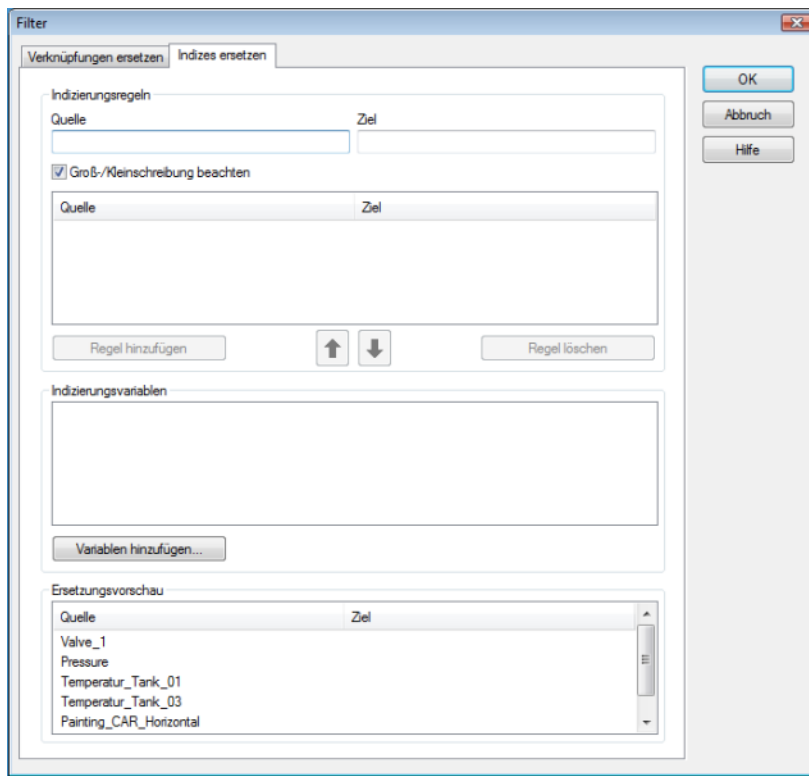
Attention

Because the names are replaced, variables and functions must always be given different names. Variables and functions are replaced if the names are the same.

Example:

If there is a variable "test" and a function "test" and the variable "test" is to be replaced, the function "test" would be replaced at the same time.

Tip: Name variables and functions with a respective prefix (such as var_ and func_). You therefore always have an overview in lists too.



To configure the replacement of indices:

1. All variables and functions used in the screen are displayed in the **Source** field of the **Replacement preview**.
2. Left-click the variable or function for which you want to create an indexing rule.
3. In the **Indexing rules** area, the variable/function is entered in the fields **Source** and **Target**. Alternatively, you can also enter the desired variable/function directly into the **Source** field in the **Indexing rules**.
4. Define the indexing rule.
The dynamic part of the rule is inserted in curly brackets, for example {X01}.

Example:

The source variable `Motors1.speed` is replaced by the target `Motors{X01}.speed`, the placeholder `x01` is replaced with the respective value of the index variable in the Runtime.

The replacement rule would thus be:

Source: `Motor1`

Target: `Motor{X01}`

5. Carry this over to **Add Rule** by left clicking in the indexing rules.
6. All indexing rules that have been created are displayed in this list.
7. You can change the order of the entries using the button with the arrow symbol.

Attention: The substitutions are executed in the order in which they are displayed in the list!

8. Variables that are not present on the screen but are used in the replacement can be inserted via the **Add Variables...** button in the **Indexing Variables** window.
9. The variables which are in this list are always kept in the memory in order to minimize waiting time when the screen is loaded.



Information

*For the placeholder * the same rules as for Replace links (on page 242) are valid.*



Attention

If index variables are used in a network project, the Client must first fetch the value from the Server. Then the calculation is executed. On devices with outdated hardware this may cause delay at screen switching.
Therefore in a network project index variables should always be set to `DDE active`.

CROSS-PROJECT

If the target is in a different project to the source, this can be displayed using '#'.



Example

Source: VAR_1

Target: VAR_1 in Project_1

You thus enter VAR_1 as the source and Project_1#VAR_1 as the target.

Source: SUBPROJECT1#VAR_1

Target: {X01}VAR_1

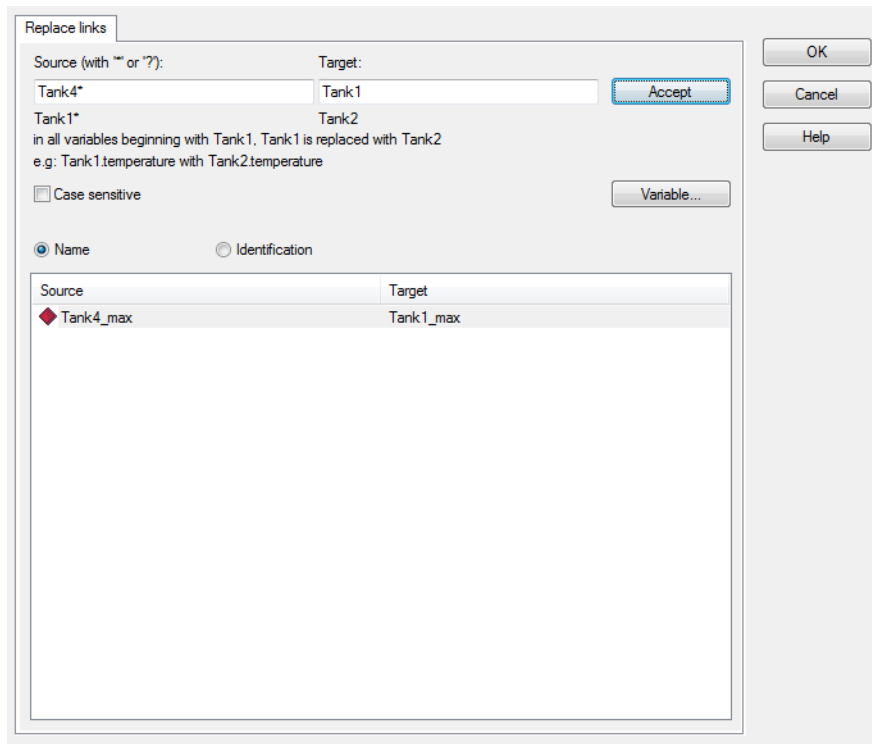
The index variable X01 is a string variable and has the project name including # as a value, for example "SUBPROJECT4#".

11.2.5 Example: Rule-based replacement of variables

All variables with "Tank1" in the name are to be replaced with "Tank4".

1. Enter "Tank1" into the `Source` text field. You can include all variables that start with "Tank1" with the * character.
2. Enter "Tank4" into the target text field.
3. Click on Accept.

4. The variables Tank1_max and Tank1_min are replaced by the variables "Tank4_max and Tank4_min.



11.3 Background graphics

A graphics file can be displayed in the background of every screen. These graphics are positioned in the visibility level furthest to the back and are covered by all other screen elements. It works along the lines of the background graphics of Windows Desktop.

Options such as centered or tiled are available for positioning. It is not possible to freely move the graphics.

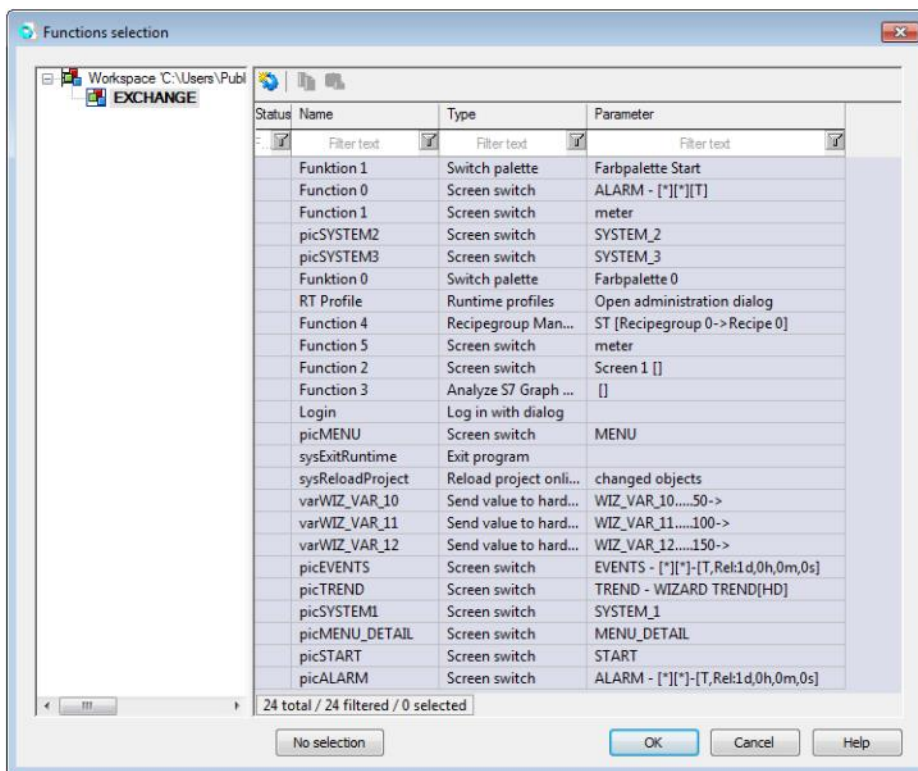
Only graphics data that is already available in the project in the Files/Graphics area can be used. See: Files.

Tip: If you wish to use the same background graphics for several screens, you can pre-define the background graphics in the frames. See: Background graphics for frames (on page 270)

Tip: Alternatively, a button with a graphics file can be used without a linked function to display a freely-positionable graphics file

11.4 Functions Selection dialog

In order to select functions, a filtered dialog is opened:



Element	Description
Project tree	Definition of the project from which the function should be selected.
Selection window	Selection of the function.
No selection	Depending on the element: <ul style="list-style-type: none"> ▶ the dialog is canceled ▶ already linked functions are deleted

Hint: The size of this dialog can be adjusted. The dialog size and position are saved.

CHANGE LINKED FUNCTION

- manually
 - in the Project Manager's Detail view open the functions
 - drag the desired function on the element while holding the left mouse button

- the previous function is substituted by the new one
2. automatic
- Select the entry Replace links from the context menu. For more details see chapter Substitution of variables and functions in dynamic elements (on page 240).

11.5 Variable selection dialog

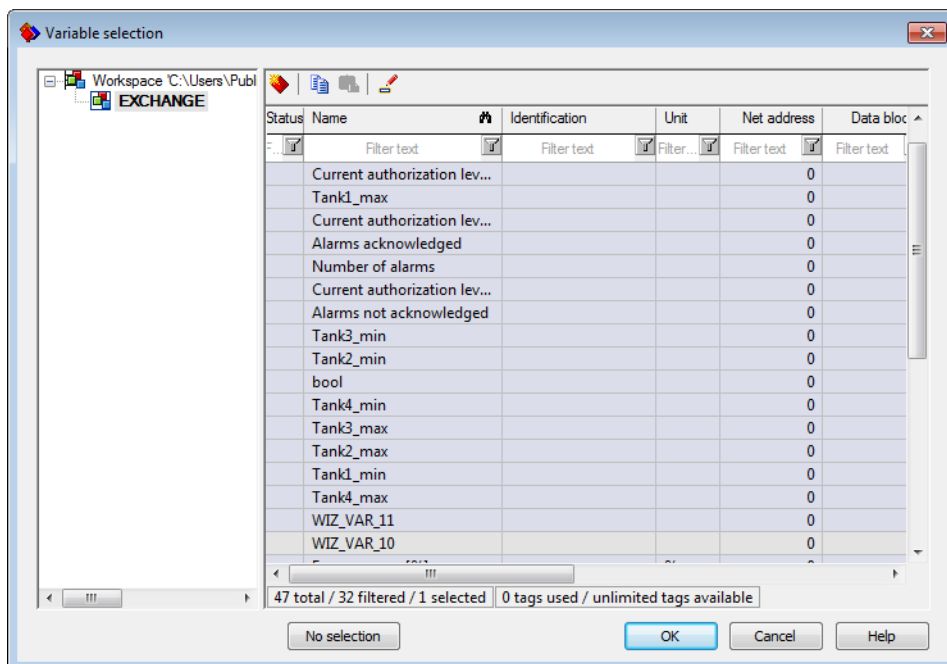
In order to select variables, a filtered dialog is displayed.

Hint: The size of this dialog can be adjusted. The dialog size and position are saved.

Note: These variables can also be used throughout projects sometimes. When selecting throughout projects, ensure that the corresponding projects are available in Runtime.

LINKING A VARIABLE

Elements that can only be linked with one unique variable open the following dialog:



Element	Description
Project tree	Selection of the project from which the variable is to be selected.
Selection window	<p>Selection of the variable which shall be linked. It can be linked in two ways:</p> <ul style="list-style-type: none"> ▶ By double-clicking on the desired variable: The dialog is closed automatically. ▶ By selecting the desired variable and subsequently clicking OK.
No selection	<p>Depending on the element:</p> <ul style="list-style-type: none"> ▶ the dialog is canceled ▶ Variables that are already linked are deleted (such as linked lot variables in the Historian)

Note: If the desired variable is not displayed, there can be several reasons for this:

- ▶ You have selected a filter and the desired variable does not match the filter: Check whether there is a filter active in the filter line. The information about filtered elements which is displayed at the bottom of the selection window also helps when checking for an active filter.
- ▶ The dialog is filtered by the Editor and the variable does not match the filter. The filtered display takes place when only special data types are allowed; e.g. for the dynamic element Numerical value no string variables can be linked.
- ▶ You have selected the wrong project in the project tree.

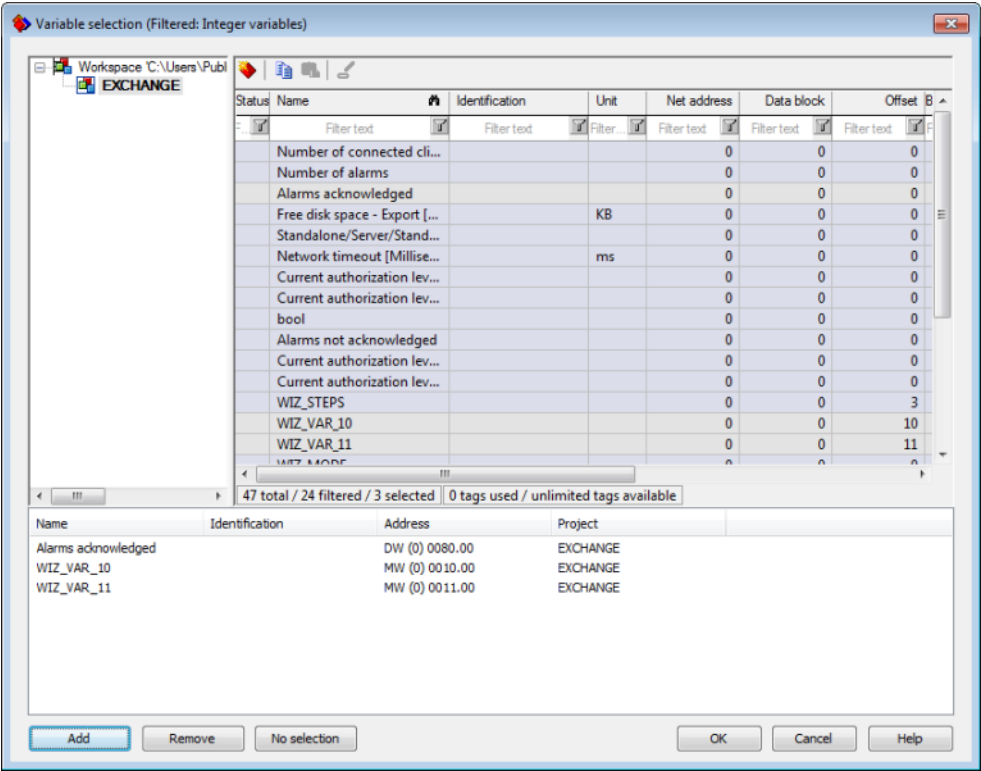


Attention

The dialog generally allows the choice of multiple variables via the usual Windows keyboard shortcuts, but in this step only one can be linked. For multiple selection the first chosen variable is assigned to the element.

LINKING MULTIPLE VARIABLES:

Elements that can be linked with multiple variables open the following dialog:



Element	Description
Project tree	Definition of the project from which the variable shall be selected.
Selection window	<p>Selection of the variables:</p> <ul style="list-style-type: none"> ▶ Double click the selected variable in order to add it to the variable list. ▶ You can move the selected variable to the variable list via Drag&Drop ▶ Select the desired variable. With the help of Ctrl and/or Shift multi-selection is possible. By clicking Add the selected variables are added to the variable list.
Variable list	Lists all selected variables.
Add	Adds the currently selected variable of the selection window to the variable list.
Delete	Removes the variables which are selected in the variable list from the list.
No selection	<p>Depending on the element:</p> <ul style="list-style-type: none"> ▶ the dialog is canceled ▶ certain links such as lot variables in archiving can be released

Note: If the desired variable is not displayed, there can be several reasons for this:

- ▶ You have selected a filter and the desired variable does not match the filter: Check whether there is a filter active in the filter line. The information about filtered elements which is displayed at the bottom of the selection window also helps when checking for an active filter.
- ▶ The dialog is filtered by the Editor and the variable does not match the filter. The filtered display takes place when only special data types are allowed; e.g. for the dynamic element Numerical value no string variables can be linked.
- ▶ You have selected the wrong project in the project tree.
- ▶ Change linked variable

Select the entry **Replace links** from the element's context menu. For more details see chapter **Substitution of variables and functions in dynamic elements** (on page 240).

12. Frames

Frames form the basis for the layout of the window and the screens displayed during the Runtime. You structure the display on the screen and determine the position. Each screen is assigned to a frame and displayed in the screen area defined by the frame.

Frames determine the general window properties such as position, size, appearance and manipulation options during runtime. Frames:

- ▶ Provide an overview of all windows defined in a project
- ▶ can be freely defined via the `Define free frame shape` property
- ▶ enable special functions to be allocated to all screens available in a frame, for instance:

Return to last screen, set focus on frame, take focus from frame, close frame, acknowledge flashing alarms, print screenshot

- ▶ change all screens based on this frame
- ▶ Screens always appear in the same size at the defined location in runtime and cannot be moved as desired
- ▶ Frames can always be automatically closed during runtime if the focus is lost
- ▶ Screens within a frame can be changed at will in online operation.



Information

If there is no frame when creating a screen, then zenon automatically creates a default frame that covers the whole screen.

CONTEXT MENU PROJECT MANAGER

Menu item	Action
Frame new	Creates a new frame.
Open frame editor	Opens the frame editor in the main window and shows the list of frames in detail view.
Export XML all...	Exports all entries as an XML file.
Import XML...	Imports entries from an XML file. Note: Existing frames are overwritten via the Frames node during XML import. In this case, all screens and their elements are adapted to the new frame.
Help	Opens online help.

12.1 Frame detail view toolbar and context menu



Menu item	Action
Frame new	Adds a new frame to the list and puts the focus onto this entry.
Open frame editor	Opens the frame editor in the main window.
Define free frame forms	Changes to the main window to define a free frame shape.
Jump back to starting element	If you entered the list via function linked elements , the symbol leads back to the start element. Only available in the context menu when all linked elements are opened.
Copy	Copies the selected entries to the clipboard.
Paste	Pastes the contents of the clipboard. If an entry with the same name already exists, the content is pasted as " Copy of . . . ".
Delete	Deletes selected entries after a confirmation from list.
Export selected XML	Exports all selected entries as an XML file.
Import XML	Imports entries from an XML file. Note: Existing frames are overwritten via the Frames node during XML import. In this case, all screens and their elements are adapted to the new frame.
Remove all filters	Removes all filter settings.
Edit selected cell	Opens the selected cell for editing. The binocular symbol in the header shows which cell has been selected in a highlighted line. Only cells that can be edited can be selected.
Replace text in selected column	Opens the dialog for searching and replacing texts.
Properties	Opens the Properties window for the selected entry.
Help	Opens online help.

12.2 Frame editor

You can define and position all frames in the frame editor.

12.2.1 Opening the frame editor

To open the frame editor:

- ▶ In the project manager, click on the desired frame twice in Frames Detail View
- or
- ▶ select *Project Manager -> Frames -> Context Menu -> Open Frame Editor*

The size displayed in the frame editor is dependent on the monitor size set in monitor administration. See chapter on monitor configuration.) If the monitor settings are subsequently changed, the frame editor must be closed and reopened in order for it to take the new monitor settings into account.



The red frame for the alarm status line is automatically created at the upper edge of the screen by zenon for each project. Its position can be changed via the properties in the `Position` group. To do this, the `Use standard position` property must be deactivated.

12.2.2 Display frames in frame editor

Frames can be switched to visible or invisible by:

- ▶ `Property Display in Frame Editor`:
activated: displays frame

- ▶ Drag&dop:
 - invisible Drag frame from the main window
 - visible: drag frame from the detail view into the main window
- ▶ Detail view-> View of frame editor:
 - invisible: Deactivate checkbox
 - visible: Activate checkbox

You obtain information on the name and position of the frame in the upper left corner of the frame and via tooltip if you move the mouse pointer over the frame.



Information

A system menu or an alarm status line is automatically taken into account in the frame editor and always displayed in the foreground. An incorrectly positioned frame can therefore not hide any important information during runtime.

12.2.3 Create new frame

You have two possibilities to create a new frame:

- ▶ create a new frame:
 - Project Manager -> Frames -> Context Menu-> Create New Frame or Frame Detail View -> Context Menu -> New Frame*

With this, a new standard template is created in the size defined in monitor properties.

- ▶ to draw a new frame: *Main Window-> Context Menu -> Draw New Frame*

The mouse pointer becomes a black square with a cross in the upper left left corner as the starting point. With this, you drag the frame in the size you have defined to the desired position.

CREATE NEW FRAME

To create a palette:

1. In the project manager, select the **F**rames sub item in the **S**creens node

2. Select **New frame** in the context menu.
3. A new waterfall frame is created.
4. The initial size is determined by the size of the display.
5. click in the new frame and drag the frame over the touch point to the desired size

The size can also be modified using the `Width [pixels]` and `Height [pixels]` properties in the `Position` group.

6. position the frame at the desired location in the window
7. Define the desired properties in the properties window



Attention

If frames receive the same name in the global project and in the subproject, then frames in the global project are automatically given the prefix `g_`.



Example

three areas must be present in the whole project:

- ▶ A header appears at the top of the screen with the time and a logo.
a "header" frame is defined for this area. This defines the size and position of the header.
- ▶ A menu appears at the bottom of the screen.
A "menu" frame is created.
- ▶ Interim process screens.
A "process screen" is created.

The frames are always displayed in the defined size at the defined location. All screens created then are linked to one of these frames and in the Runtime opened in it. If the screen design is changed, because, for instance, menu bars are to be displayed at the top and the header is to be a footer, only the position of the frames need be changed. The screens contained in the frames are automatically carried over.

Hint: Never place the templates directly above one another. This way you ensure that you always have access to the screens in Runtime.

POSITIONING FRAMES

The position and orientation of a frame or a group of selected frame can be selected via the **Arrange** context menu in the main window.

POSITIONING WITH CONNECTION POINTS

If the option 'Use connection points' was activated (see chapter Editor, Section Settings), the connection points of frames stick to those of other frames. In addition, frames can connect to the screen border and to a possibly present (if activated in the project) alarm line.

Frame with free frame shape

You can adapt the frame shape to your individual wishes using the `Freely defineable frame shape` property. After you have activated this property, you arrive at the frame editor in one of the following ways:

- ▶ Click on the button of the `Define free frame shape` property
- ▶ Click on the corresponding symbol frame in the toolbar (on page 259)
- ▶ Select the menu entry `Define Free Frame` in the context menu (on page 259) when selecting the frame
- ▶ Select the `Define Free Frame` menu entry in the Context menu in the frame editor
- ▶ Double click on a frame in the frame editor

Here, you can create the frame as you wish with the rectangle, circle, rounded rectangle and polygon elements.



Information

Freely defineable frame shape is not available:

- ▶ For alarm status line frame
- ▶ Under Windows CE

If the Define free frame shape property is deactivated an existing free frame form is not displayed in either the frame editor or the screen editor.

You decide how the respective element influences the appearance of the frame with the help of the `Area utilization` property. To do this, the following settings are available:

Parameters	Description
Cover	The surface of the element is used as the screen area.
Cut	The surface of the element is removed from the surfaces underneath. For instance, you can create "holes" in the frame, for example.
ORed	This is either cut out or covered according to whether a covering element is under the element or not.



Info

The way the surface is used always relates to the surfaces under the element. If you, for example, draw a covering element over a cutting element, the surface is displayed filled. If you reverse the sequence, the cutting element is removed from the covering element.

12.2.4 Positioning in runtime

Frames can be switched to fixed or relatively defined positions in Runtime. In this way, keyboard screens or pop-up screens can be positioned exactly where the mouse pointer or the element to be switched is located. Frames can be switched in runtime:

- ▶ at an absolute position
- ▶ relative to the mouse position

- ▶ relative to the element

Absolute and relative positions are defined in properties.

RETAIN POSITION FOR NEXT TIME

Windows always take their screen position from the template. If pop up screens are planned and moved whilst the program is running, the pop up screen is moved back to the planned position the next time the screen switching function is activated. Using the `Keep position when displaying again` property, the template can be set to keep its position as long as it is open, regardless of screen switches. If the property is active:

- ▶ If a screen is opened in Runtime in a manually-moved template, its position is also retained if the screen is switched.
- ▶ If another screen is opened in the in the same template, its position is retained. This also applies for a substituted call.

With this, a different position position for a template can be used on each client, because the local position is always saved.

ABSOLUTE POSITIONING

The frame is always switched at fixed, pre-defined coordinates. A fixed screen position is always used for all screens that are loaded automatically by the system, e.g. by the time control or a limit violation.

RELATIVE POSITIONING

Relative positioning is especially suited to loading pop-ups, keyboard screens or command screens. This is possible for all screen switches, set value inputs with freely defined keyboard screens, and command screens that are started manually by the user. It does not matter whether the action was triggered by a screen switch function, a set value function or directly via an element. Relative positioning is available for:

- ▶ dynamic elements to which you can allocate a function
- ▶ dynamic elements that can be used to send a set value (buttons, combined elements)
- ▶ Main and Context Menus
- ▶ execute the screen-specific function in the Alarm Message List screen

Relative positioning also works for nested function calls, i.e. when screen switching or the setting of values are triggered by a script. If the screen would stand over the screen border, it is automatically positioned at the screen border. This also applies to multi-monitor management, where screen would rise into the neighboring monitor.



Attention

Relative positioning only works when called up directly by the user, not with automated functions or via VBA.

RELATIVE TO THE ELEMENT

Positions the reference point of the frame relative to the element from which the screen switch was initiated (e.g. a button or a combined element). The frame's reference point is then always placed on the element's calculated reference point. If the frame cannot be switched off in this position because the screen would then be outside the visible screen area, the alternative reference points are used.

First define a reference point for your frame and then the preferred position in the element. The following settings are available:

Property	Value
Reference point element vertical	below
	top
Reference point element horizontal	Left
	Right
Vertical movement in pixels	Enter the desired movement
Horizontal movement in pixels	Enter the desired movement

ALTERNATIVE POSITION

Define an alternative position for the reference point of the frame and the reference point at the element. Proceed with the definition of the alternative positions in the same way as with the definition of the favored positions. The alternative position is used when the frame can not be placed at the favored position.

RELATIVE TO THE MOUSE POINTER

The screen is displayed depending on the position of the mouse pointer. If the reference point is at the top left side, the frame will be loaded to the bottom right side of the reference point. If the screen cannot be displayed completely at the configured position, the position will be moved until the complete screen is inside the displayed area of the screen.

Define the frame's reference point above the two properties, vertical reference point and horizontal reference point. The reference point is marked on the frame with a red dot. The following settings are available:

Property	Value
Reference point frame vertical	top
	below
	centered
Reference point frame horizontal	Left
	Right
	centered



Example

you have a button at the right border of the screen and try to position a popup window on its right side:

- ▶ Element reference point: Right/centered
- ▶ Frame reference point: left/centered

In Runtime, the popup screen will appear on the right side of the button, centered to the middle of the button. The popup window will not cover the button.

You use the same frame also for a button on the left screen border. There may not be enough room on the right side to completely display the popup screen. The alternative configured position will therefore be used. For this, you place the

- ▶ alternative reference point for the element on: left/centered
- ▶ the frame's alternative reference point on right/centered

12.2.5 Call up frame several times

Frames can be called up several times in Runtime: Screens can therefore also be called up several times. To make frames able to be called up more than once, activate the `Frame can be switched several times` property in the `General` group of the frame properties.

If this option is activated, the frame is created as an independent instance each time a screen is called up. That means: Screens that have been opened before in this frame remain open.

For example: A screen is called up 100 times:

- ▶ `Frame can be switched several times active: 100` screens are open on the monitor
- ▶ `Frame can be switched several times inactive: 1` screen is open on the monitor

NOTES FOR PROJECT CONFIGURATION

If screens that are switched more than once are covered by others, it can happen that these screens remain open, invisible and inaccessible in the background, until Runtime is closed.

The person configuring the project must therefore ensure that no screens get into the background this way.

Recommendations:

- ▶ `Activating Always in the foreground` property: This keeps the frame/screen in the foreground at all times.
- ▶ Configuration of the `Close frame` (on page 469) function: This closes all screens that are based on this frame, including those opened in the background.
- ▶ Configuring frames as freely placeable: Operators should be able to place frames on the screen according to their requirements. For example, using touch, with the mouse, or configuration of the relative position of the frame to a control or mouse pointer.

Recommendation: This option is most of all suited to configuring pop-ups.

ONLY OPEN ONCE PER SYMBOL

To open only one screen once per symbol, configure a button that is switched to invisible once it is first opened:

1. Create a button in the symbol.
2. Control the visibility of the button with a bool variable
3. Set this bool variable as a screen-active variable in the screen

As soon as the screen has been opened once, the button can no longer be operated.

12.2.6 Deleting frames

To delete frames, you can:

highlight one or more of the frames with the mouse and select **delete** in the context menu or press the **delete** key

highlight one or more of the frames in the detail view and select **delete** in the context menu or press the **delete** key

A request to confirm this action is made before it is deleted.



Attention

Deletion of frames cannot be undone.

12.3 Define background graphics for frames

A graphics file can be displayed in the background of every screen. These graphics are positioned in the visibility level furthest to the back and are covered by all other screen elements. They are positioned via properties; it is not possible to position them freely. Only graphics data that is already available in the project manager in the files/graphics area can be used.

If several screens use the same background color, this is defined with the screen frame:

1. In properties, click on the **Graphics** file property in the **Background** graphic node
2. select a file from the files/Graphics node in project manager
3. define the position with the **Alignment** property

this graphics file is then used for all screens that are created using this frame. However, individual graphics files can still be defined as a background screen for each screen.

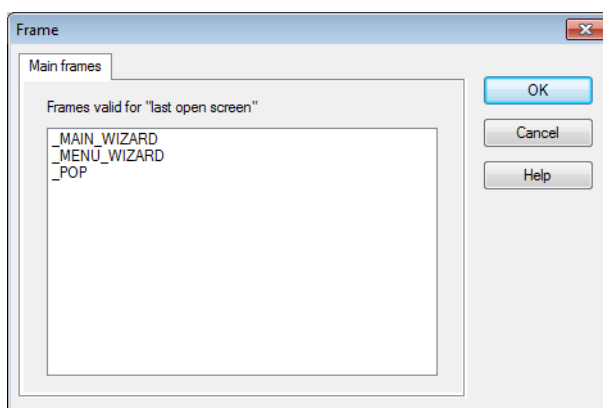
Attention! The graphics file is saved with the screens. Changing the graphics file or how they are set up in the frame is only effective for new screens. Existing screens must be changed manually.

12.4 Distributed engineering with frames

In multiuser operation, all usual mechanisms for allowing and accepting changes are implemented. In the frame editor however, in contrast to the screens, every frame is handled individually in the frame editor as opposed to the entire screen being released. For a better overview, frames where changes are not permitted are marked with a dotted border.

12.5 Main frames

Templates that were opened last can be displayed in the system driver using the variable `Last screen open`. Which templates are incorporated into the display is defined with the `Main frames` property in the project manager (Graphical design, Runtime general). Click on the ... button to open the dialog for selecting a template:



Several entries can be selected using the combination of `Ctrl` + a mouse click or `Shift` + a mouse click. Clicking on `OK` confirms the selection.



Information

This property also has an effect on the `Screen: return to last function`.

12.6 Effects for frames

Frames can also be provided with effects.

You can find additional effects for screen elements in chapter effects for screen elements (on page 207).

12.6.1 Highlight frame

With the help of **Highlight frame** you can highlight a screen in order to draw attention to this screen. For this the frame, on which the screen is based, is highlighted by coloring the remaining area of the Runtime. For this a color and a transparency are defined for the surrounding of the frame of the screen which covers the screen lying below. The screen lying below cannot be operated.

Note: The screens must be based on different frames with different sizes. You must not call up more than one screen with this property at any time.

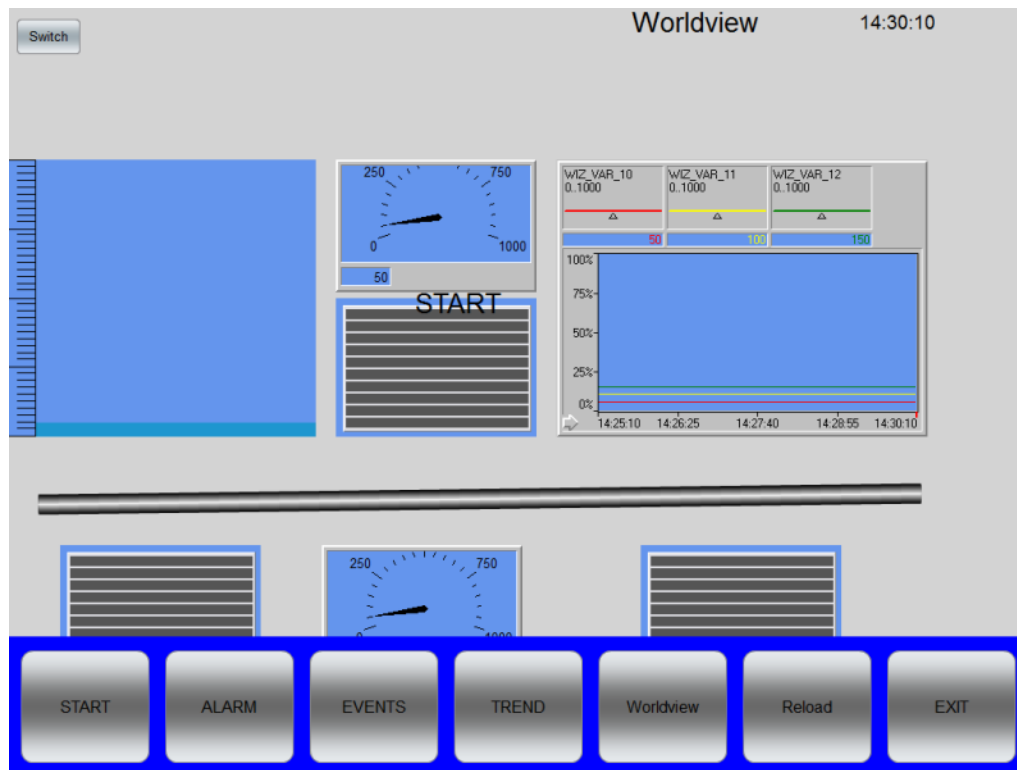
To use the effect, configure the screen which is to be on top of another, larger screen:

1. navigate to group `Window style` in the screen properties.
2. Activate the `Modal dialog` property.
3. Activate the `Highlight frame` property.
4. With property `Surrounding color` you configure the color with which the surrounding of the active screen should be colored.
This property always affects the frame on which the screen is based.
5. With property `Surrounding transparency` configure the transparency of property `Surrounding color`.
6. Engineer a button for the screen in order to be able to close it in the Runtime.

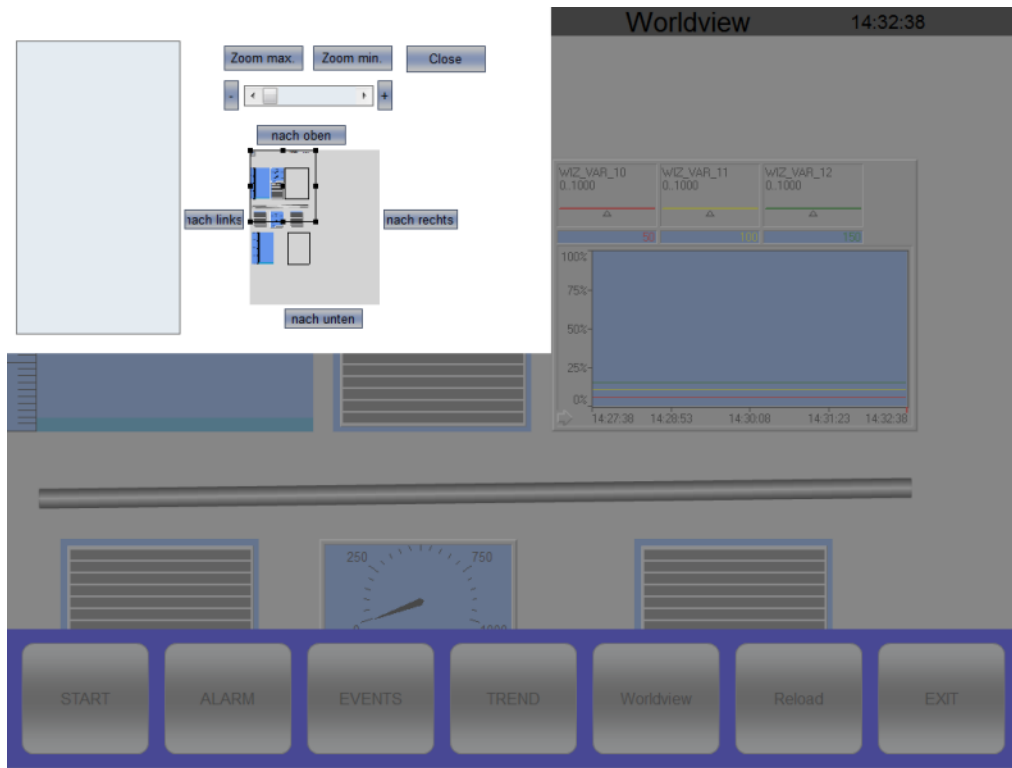
As soon as you open this screen above another, the area surrounding the frame is colored. Thus optically highlighting the screen. Only this screen can be operated. After closing the screen, other screens are displayed in normal color again and can be operated.

EXAMPLE

Screen is opened:



Second screen with active effect **Highlight frame** is also opened. Everything outside the additionally opened screen is highlighted with the color defined in property **Surrounding color** and the transparency defined in property **Surrounding transparency**.



13. Color palettes

Color palettes make it possible to compile individual colors into color palettes. You can define a color set such as this, which can be easily edited at any time, both in the editor and in Runtime. All colors that are defined with the help of palette colors can be easily changed over with this; either centrally or globally with the help of a global project. The colors of the color palette can be used anywhere where colors are used.

This allows the implementation of corporate designs (CD) requirements to be implemented without problems. If necessary, the design can be replaced completely (switching palettes) or only individual colors (color switch in palette) can be changed centrally.

ENGINEERING

Color palettes are created in the editor, can be exported and imported and there is a function to switch these in runtime. Color palettes can be created in both a global project and a local project.

Note: All palettes of a project always contain the same amount of colors. The number of colors of a global project and local project can thus be different.

Attention: In the event of conflicts in the Runtime, the local project's color palettes take priority.

CONTEXT MENU PROJECT MANAGER

Menu item	Action
New color palette	Creates a new color palette with the standard names Color palette plus continuous Index number .
Export XML all...	Exports all entries as an XML file.
Import XML...	Imports entries from an XML file.
Help	Opens online help.

13.1 Detail view of color palette toolbar and context menu

TOOLBAR AND CONTEXT MENU



no.	Symbol	Action
01	New color palette	Creates a new color palette with the standard names Color palette plus continuous Index number .
02	Create standard function	opens the dialog to create a Palette Switching Function (on page 283) and automatically activates the selected palette in the drop-down list.
03	Delete color palette	Delete the palette of the highlighted color. Palettes can only be deleted individually
04	New color	Creates a new color with the standard color white and the standard name Color plus Index number . New colors are always created for for all palettes of the project. Hint: Give clearly distinct names for the global project and the local project.
05	Delete color	Deletes the selected color from all palettes of the project. Note: The command is only active if the last color in each palette is highlighted. Because: Only the last color of a palette can be deleted, so that the index numbers continue to work. Furthermore, the color must be deleted for all palettes, so that the number of colors remains identical in all palettes.
06	Copy	Copies the selected colors to the clipboard.
07	Paste	Pastes selected colors from the clipboard.
08	Jump back to starting element	If you entered the list via function linked elements , the symbol leads back to the start element. Only available in the context menu when all linked elements are opened.
09	Color palette in the editor	opens a drop-down lists with all palettes that can be defined in the local project and in the global project.
10	Save	Saves all changes to the color palettes.
11	Export selected XML ...	Exports all selected palettes as an XML file.
12	Import XML...	Imports entries from an XML file.
13	Properties	Opens the property window.
14	Help	Opens online help.

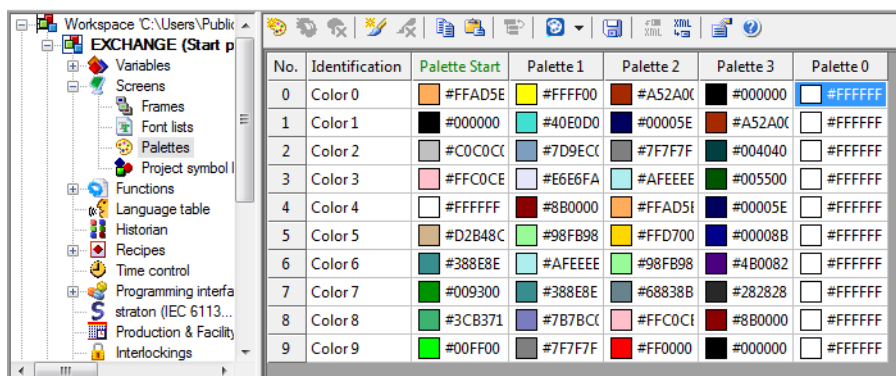
13.2 Create and edit colors

You can create color palettes globally or in a local project. Global color palettes are available in all projects, local color palettes are only available in the project in which they were created. If there are conflicts when setting these in runtime, the color projects of the local project take priority (see also Color palettes in Runtime (on page 282)).

CREATE COLOR PALETTE

To create a color palette:

- ▶ select the **Color Palettes** node (either below **Screens** in the local project or global project)
- ▶ select the **New Color Palette** command in the context menu
- ▶ a new palette is created with:
 - Standard name **Palette** plus **Index number** (for example **Palette 0**)
 - the same number of colors as the pre-existing palettes, all colors are white as standard



RENAME COLOR PALETTE

To rename a palette individually:

- ▶ select the palette or one or more colors of the palette
- ▶ In properties, select **Palette** the property **Palette name** in the group

- ▶ enter the desired palette name

Hint: Give them clear names in order to clearly distinguish between the global project and the local project

DELETE COLOR PALETTE

To delete a palette:

- ▶ highlight the palette's complete column
- ▶ In the context menu, select the **Delete Color Palette** command or press `del`
- ▶ the palette will be deleted without asking for confirmation.

Note: Palettes can only be deleted individually

13.3 Creating and editing colors

CREATE COLOR

In order to create a color:

- ▶ select a color or a palette
- ▶ In the context menu, select **New Color** or press the `insert` key
- ▶ at the lower end of the color table, a new color is inserted for all palettes with
 - Standard color `white` and
 - `color` plus `Index number`, for example `color10`
- ▶ define the color and give it a name

RENAME COLOR

To rename a color:

- ▶ select the color
- ▶ In properties, select `Color` the property `Identification` in the group

- ▶ enter the desired name

Tip: You can already differentiate between a global project and a local project when giving it a name, so that you know where the palette comes from when choosing the color palettes later

DEFINE COLOR

to define a color:

- ▶ highlight the desired color in the palette
- ▶ enter the color:
 - either directly into the table cell in the detail view, as a hexadecimal code or via the selection dialog by clicking on ...
 - or in the properties in the `Color` group in the Property `Color` field as a hexadecimal code or via the selection dialog by clicking on ...

DEFINE COLOR VIA DIALOG

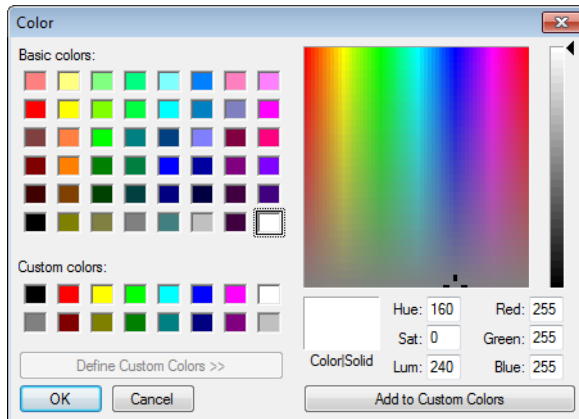
To select pre-defined base colors from a dialog or to create your own colors:

- ▶ in the detail view, click in the cell with the desired color or in Properties `Color` on ...
- ▶ the dialog for the selection of standard colors opens



- ▶ click on a standard color to allocate it

- ▶ to define your own color, click on the **Define Color** button



- ▶ define the color
- ▶ using the **Add Color** button, add it to **User-Defined Colors**
- ▶ select the desired color
- ▶ assign the color by clicking on **OK**

COPY COLOR

To copy several colors of the same color definition:

- ▶ highlight the hexadecimal code of the color in the input field of the desired color
- ▶ copy the hexadecimal code with **ctrl+C** or the **Copy** command in the context menu
- ▶ insert the hexadecimal code for all colors which should receive the same color definition with **ctrl+V** or the **Insert** command in the context menu

DELETE COLOR

Colors from palette are distinguished clearly by means of their index in the palettes (= row number in palette window). Therefore the colors can only be deleted at the end of the palette, because otherwise the indices of subsequent colors would change. Because all palettes in the project must have the same color, only complete rows can be deleted. To delete a color from all palettes:

- ▶ Highlight the rows to be deleted, starting with the lower end of the palette colors
- ▶ In the context menu, select **Delete Color** or press the **delete** key

13.4 Use palettes in the editor

SELECTING THE ACTIVE PALETTE IN THE EDITOR

In the editor, a palette can be used as the active palette for display and color selection from the local or global project.

To select a palette for display in the editor:

- ▶ Click on the table of color palettes with the right mouse button.
- ▶ select `Color palette in the editor` in the context menu
- ▶ select the desired palette from the drop-down list

Note: Palettes from the local project are arranged before those from the global project.

Attention: If there are palettes with the same name in the global and local projects, only the palettes from the local project are offered for selection.



Attention

If there is a different number of colors configured per palette in the global and local project, there may be less colors available for the active palette selection!

Palette definitions from the local project always have priority: If there is at least one color configured in the local project palettes, the amount of colors from the local palette are offered; otherwise the amount of a colors in the global project are offered.

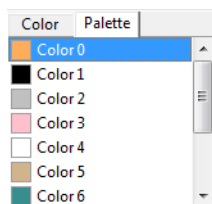
Colors missing from the active palette are displayed in white.

SELECTING THE PALETTE COLORS

Colors from the palette are assigned in the editor via:

- ▶ Dialog in properties
- ▶ Drag & drop the description of a color into the corresponding field in properties
- ▶ Direct input of the description of a color in the corresponding field in properties

If an element is assigned a color via properties, the color dialog opens with two tabs:



- ▶ Colors Selecting a particular color
- ▶ Color palettes: selecting a particular color palette from the active color palette

If there are not palettes with at least one color configured in the local or global project, or if the property does not allow a color to be assigned, only the tab colors are displayed.

COLORS FOR MULTI-USER PROJECTS

Changes to color palettes can only be enabled, transferred or discarded for all palettes of a project.

13.5 Create Runtime Files

The palettes of the global project and local project are carried over in a joint list when creating Runtime files. There may be conflicts in doing so. Note:

- ▶ The local project always has priority.
- ▶ Each palette displays the unified amount and therefore contains as many colors as the largest palette.
- ▶ If the palette of the global project and the local project contain different amounts of colors, the shorter palettes are filled with `white`, so that all palettes have the same amounts of colors and a color is available in each palette for each color index.
- ▶ With palettes that have the same name, the palettes of the local project are used and filled with the colors of the global project if this contains more colors.

Example:

- ▶ There are 3 palettes in the global project: `Global 1`, `Global 2` and `Palette 1` with 10 colors each.
- ▶ There are two colors in the local project: `Palette 1` and `Palette 2` with 5 colors each.

- ▶ In Runtime there is then:
 - `Palette 1` comes from the local project and overwrites `Palette 1` from the global project; it contains the 5 colors from the local project plus the colors 6 - 10 from `Palette 1` from the global project
 - `Palette 2` contains the 5 colors from the local project plus the colors 6 - 10 initialized as `white`
 - `Global 1`: Contains the 10 colors from the global project
 - `Global 2`: Contains the 10 colors from the global project

SWITCH COLORS IN RUNTIME

To switch colors in runtime, you need the `Switch palette` function (see chapter on switching color palettes (on page 283)).

You can find an example of switching in Runtime in the chapter on the example for editor und Runtime (on page 286).

13.6 Switch color palette function

When starting runtime, the first palette in the project automatically becomes active, so long as another palette is not activated via a start script.

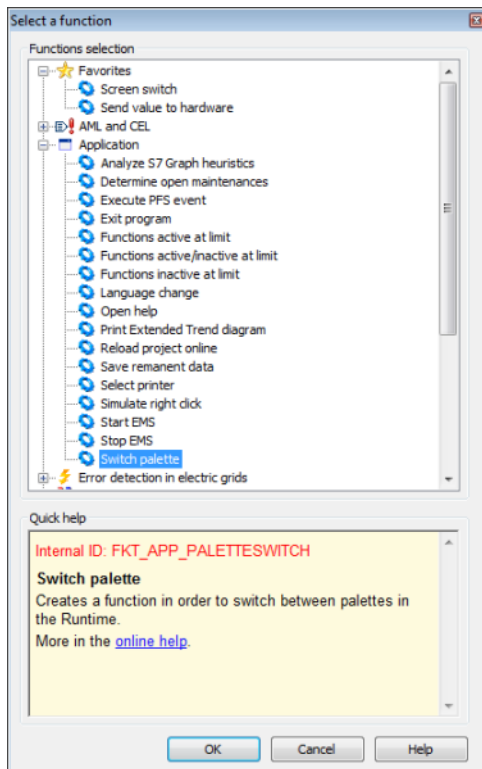
The active palette can be changed in runtime by means of the `Switch palette` function. All screens and elements are then relabeled with the colors of the new palette.

The respective active palette is defined via the name of the palette. If no palette exists with the given name, the first palette in the project is activated.

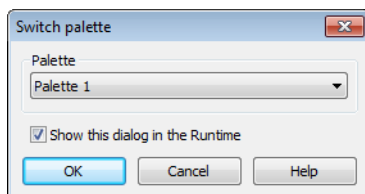
To create the `Switch palette` function:

- ▶ In the project manager, select the `New Function...` command in the `Functions` node.
- ▶ navigate to `Applications`

► selectSwitch Color Palette



- confirm with OK
- The dialog to select the color palette is opened



Parameters	Description
Palette	Select the desired color palette from the drop-down list.
Show this dialog in the Runtime	Enables a new color palette to be selected in runtime.

13.7 Export and import

Color palettes can be exported as XML files and imported from these.

EXPORT

To export a palette:

- ▶ select the desired palette
 - to select several palettes use the `ctrl` or `shift` key or hold down the left mouse button and move the mouse over the title line of the table
 - (**Note:** selected palettes can no longer be deselected individually)
- ▶ only complete selected palettes can be exported, not individual colors
- ▶ select **Export selected XML...** in the context menu or in the tool bar
- ▶ in the file manager that opens, select a location to save the file and a name for the XML file

IMPORT

To import a palette:

- ▶ select **Import XML...** in the context menu or in the tool bar
 - ▶ select the file you wish to import in the file manager that opens
 - ▶ The palettes saved in the XML file will be imported
 - ▶ **Attention:** The sequence during exporting is taken into account:
 - If, for example, a palette is exported to the third place in the table, this is imported at the same place or added at the end if the project has fewer palettes. Palettes already present here are overwritten. That means:
- If palettes are at the location that is imported to, the names and colors of the existing palettes are overwritten.
 - If a palette is imported to a free location, it is inserted at the end of the sequence and named with the consecutive standard names.
 - If the name of an imported palette is already used for a palette at a different location, then the colors and not the name of the overwritten palette are replaced.
 - If the imported palette features more colors than those that already exist, the missing colors are supplemented with `white` in the existing palettes
 - If the imported palette has fewer colors than the existing one, the missing colors are accepted by the overwritten palette or supplemented with `white`, if no palette was overwritten.

13.8 Error messages

When transferring elements, for example by importing XML files or copying & pasting, some palette colors may no longer be displayed correctly. Possible reasons:

- ▶ no color palettes have been created in the project yet
- ▶ Palettes have a different number of colors
- ▶ Colors were deleted

The corresponding error message is displayed in the properties input field, the element is displayed in `white`.

Error message	Reason
No palette loaded!	No palettes were configured in the local and global project.
Palette color not available!	The is no color in the project's palette with the corresponding index.

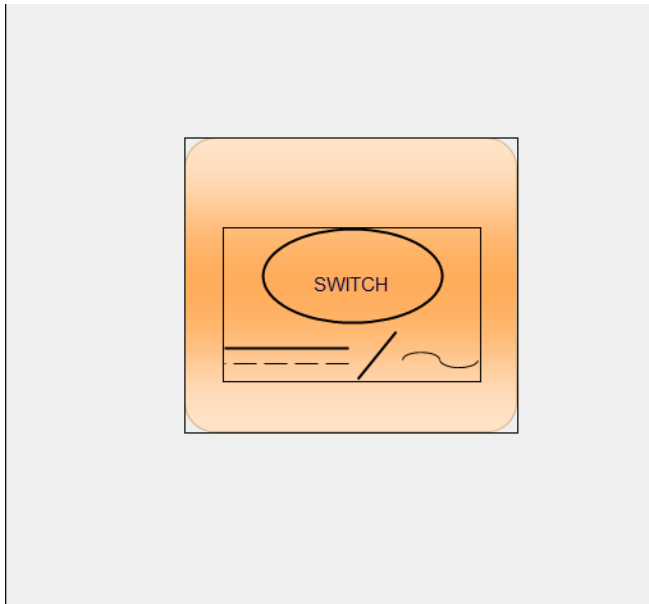
13.9 Example for Editor and Runtime

IN THE EDITOR

This is how you use color palettes in the editor for example:

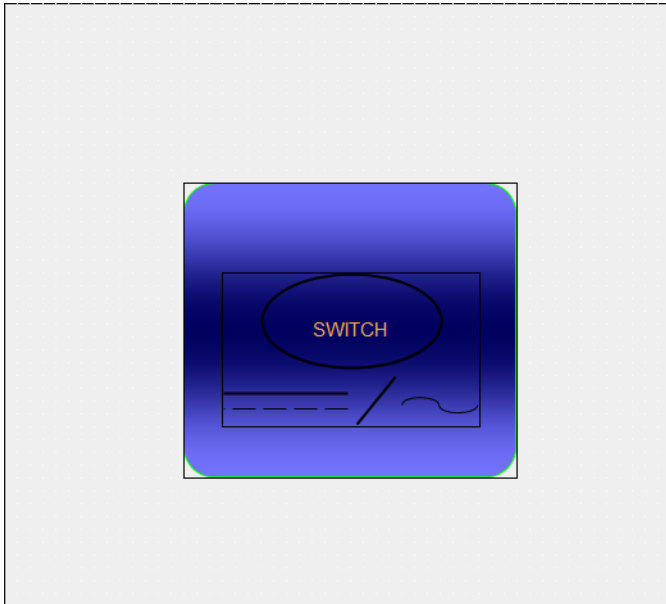
- ▶ create a screen with a button with text and a graphic element
- ▶ choose `Fill color` in properties
- ▶ click on ...
- ▶ the dialog for selecting colors opens
- ▶ select the `color palette` tab
- ▶ the colors of the active color palette are displayed

- ▶ select the desired color
- ▶ repeat this step for the properties `Border color` and `Text color`
- ▶ Screen with basic color palette



- ▶ In the color palette table, right-click in a cell
- ▶ select `Color palette in the editor` in the context menu
- ▶ in the drop down list, select a different palette, for example, `Palette 2`

- Screen in the editor:



IN RUNTIME

The screen with the color palette activated in the editor is displayed in Runtime.

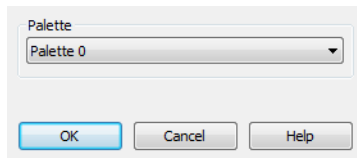


If you have configured a switching function (see chapter on Color palette switching function (on page 283)), you can change the color palette in runtime.

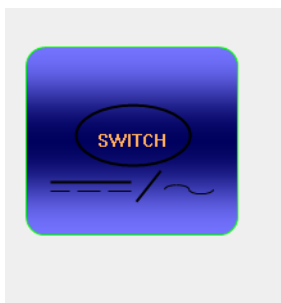
To do this:

- Click on the element.

- If the **offer this dialog in Runtime** option was activated, a new palette can be selected in Runtime; otherwise the palette given in the function is shown automatically



- the element is switched to the new colors



14. Fonts

In zenon all the fonts installed in the operating system can be used. The **Fonts** node is under the **Screens** node in the Project Manager.

PROJECT MANAGER CONTEXT MENU

Menu item	Action
Font list new	Creates a new font list in the detail view
Export XML all...	Exports all entries as an XML file.
Import XML...	Imports entries from an XML file.
Help	Opens online help.



Information

The selected font must also be present on the target system with Runtime. If the font is not present on the target system, another font present on the system from the same family is used.

COMPATIBILITY WITH DIRECTX

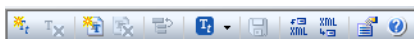
Not all fonts are suitable for use with Direct X. TrueType and OpenType are suitable for use with DirectX. Bitmap fonts are not suitable. Unsuitable fonts are replaced by a suitable font in Runtime.

- ▶ Recommended for use zenon and suitable for Direct X:
 - TrueType (.ttf)
 - OpenType (.otf)
- ▶ Not suitable:
 - Bitmap (.fon) such as `system` or `script` for example
 - Adobe Type 1 (.pfm/.pfb)

14.1 Font lists

By default, one font list exists. This is displayed in the detail view if the Screens / Fonts node is selected in the Project Manager.

TOOLBAR AND CONTEXT MENU



Parameters	Description
Font new	Creates a new font. The Windows dialog 'Font' is opened, where the font type, style, size, etc. can be defined. See chapter Creating a new font (on page 293).
Delete font	Removes the selected font from the font list.
Font list new	Creates a new font list (same functionality as in the Project Manager). See chapter Creating a new font list (on page 292).
Delete font list	Deletes the selected font list.
Save	Saves the changes.
Font list in the Editor	Displays all existing font list, the active one is marked.
XML export selected	Fonts and font lists can be imported/exported. See chapter Import/Export / Screens / Fonts.

The name of the font list can be changed in properties.



Attention

*Name changes performed later on will not be integrated automatically. If you change the name of a font list after creating a function **Language Change** for this font list, you also have to change the name of the font list in that function.*

FONT LISTS: GLOBAL PROJECT VERSUS PROJECT

The Editor always has a font list actively switched. To use fonts from the standard project and the global project, the font lists in these two projects must be named the same.

Note when using font lists in global projects:

- ▶ If font lists are named the same in a global project and a standard project, the font list of the standard project takes priority in Runtime.
- ▶ If there are different names, two font lists are present in the standard project, either one of these is used in Runtime as desired.

To avoid this effect: Plan a language switching function by selecting the font list.

14.1.1 Creating a new font list

In order to link elements to fonts, which do not belong to Font list 1, another font list has to be created.

CREATING FURTHER FONT LISTS:

A new font list can be created in the Project Manager in the section Screens / Fonts with the entry **Font list new** from the context menu. The new font list is displayed in the detail view of the Project Manager.

The default font is also automatically created in the first position here.

ACTIVATING A FONT LIST:

To activate a font list, click in the header for the desired font list and select the entry **Font list in the Editor** from the context menu. This can be necessary for language switchable texts. So you can check already in the Editor, how the element with the font will look in the Runtime. (e.g. whether the font is too large for a button). See chapter: Language switch / Fonts



Information

There is no default font list for Runtime. If several font lists are planned, the font list to be used in Runtime must be set using Language switching.

14.2 Default font and system font

Every new element is linked to a default font. This is the font that is assigned to the element type. Changing the property **Font** of an element causes that every new element of that element type is connected to this new font. After the editor is restarted, the default font is used for all element types again. The default font is **Arial 10**, supports antialiasing and is on the second position of the list. Position.

The following fonts are automatically created when a project is first created:

Font	Font style	Size	Information
Arial	Standard	8	
Arial	Standard	10	Default font
Arial	Standard	12	
Arial	Standard	14	
Arial	Standard	20	

- ▶ The default font can be edited. The changes take effect everywhere where this font is linked.
- ▶ The system font is not scalable, which can lead to problems during zooming or when adjusting the resolution automatically.
- ▶ The default font can be changed via the `Font` property. The dialog is the same one that opens when `New Font` is selected in the context menu.

14.2.1 Creating a new font

One font list exists by default, which is displayed in the detail view of the Project Manager and can be filled with different fonts.

CREATING A NEW FONT IN THE FONT LIST:

Click in the window of the detail view and open the context menu with a right mouse click. Select the entry 'Font new' here.



The Windows dialog **Font** is opened. Here the following settings are available:

Parameters	Description
Font family	All fonts of the operating system are sorted alphabetically
Font style	Bold, italic, etc.
Size	Font size in pixels
Effects	Underlined, strike-out
Color	Selection of the font color
Script	Western, Cyrillic, etc.



Information

The color settings are ignored. Text is displayed in black unless the color has been explicitly edited in the properties. Text colors only change in the Runtime (e.g. because of limit violations).

For fonts in global projects refer to chapter: Project administration / global project

**Attention**

*All fonts used must be installed on all computers on which the project will be started.
The installation can also be carried out with Remote Transport. See also: Define files
(copy®ister)*

14.3 Naming and numbering fonts and font lists

When creating a zenon project, 5 default fonts (on page 292) are created. The name of the font list and the default font are dependent on the language in which the Editor was started. This applies for standard projects and global projects.

The fonts are given numbers. Number 1 and 2 are standard fonts. These two numbers cannot be changed, all other numbers can be adapted individually. When creating dynamic elements, this is automatically allocated to the font with number 2.

The Editor always has a font list actively switched. To use fonts from the standard project and the global project, the font lists in these two projects must be named the same.

Note: zenon projects that have been converted from version 5.50 into a later version have no default font list if the project has no fonts in 5.50.

GLOBAL AND LOCAL

Fonts from the local standard project have a higher priority than fonts from the global project. For example: There is a font with the number 50 in the global project. This font can be used in the workspace in any standard project as long as the standard project does not have a font with the number 50. If there is also a number 50 in the standard project, this font is used.

The fonts with the numbers 1 and 2 cannot be deleted in the standard project. That means: The fonts with the number 1 and 2 can be changed in the global project. However, they cannot be used in the standard project, because these two numbers are always present in the standard project and have a higher priority. An offset can be used to differentiate fonts from the global project and the standard project. For example, font 2 from the standard project can become font 2002 in the global project.

Workaround to use fonts 1 and 2 from the global project in the standard project: Delete the font list in the standard project and name a new empty font list the same as the font list in the global project.

DELETE FONT LIST

If the fonts with the numbers 1 and 2 from the global project are to be used in the standard project, the font list must be deleted in the standard project. To do this:

1. This is how you create a project backup:
2. If adapted fonts from a standard project are to be used globally:
 - a) Carry out an XML export of the font list from the standard project
 - b) Carry out an XML import of the font list into the global project
3. Open the SQL folder for the standard project

Hint: Highlight the project in zenon -> press `Ctrl+Alt+E` -> Explorer opens the project folder -> navigate on to `zenon/system`

4. close the workspace
5. Delete the file named `fonts.bin`
6. open the workspace
7. Now name an empty font list with the same name as the font list in the global project

Now the fonts with the numbers 1 and 2 from the global project are used in the standard project. New elements use the font with number 2 from the global project, if this is available, and the system font if the global project is not available.

DYNAMIC AND STATIC

Fonts for the `static text` vector element and for dynamic elements are saved differently. The reason for this: `static text` can also embed fonts.

Embedded means: The font is not linked to a font list, but is instead local and only configured for this element.

Attention: This does not mean that the font is embedded in the screen and is thus always displayed correctly. The font must continue to be present in the system that is displaying it.

IMPORT AND EXPORT VIA XML

When importing and exporting via XML, the `Name` property is used for identification with dynamic elements. If for example, in the global project there is a font with the name "zenon" and in the local

standard project there is another font that also has the name "zenon", then the font of the local project is used during import and export.

Hint: The font names must be clear in the global project and standard project. The Editor does not check this.

VBA

VBA uses the `Number` property of the font for dynamic elements. Here, the offset can be useful for fonts in the global project and in the standard project.

For example: Font 2 from the standard project is replaced by 2002 from the global project. For vector elements, the font number is saved in the second position of the font string. In the font string "0 7 0 0 700 255 0 0 0 3 2 5 34 Arial", the number of the font is 7 and can easily be replaced by 2007 from the global project.

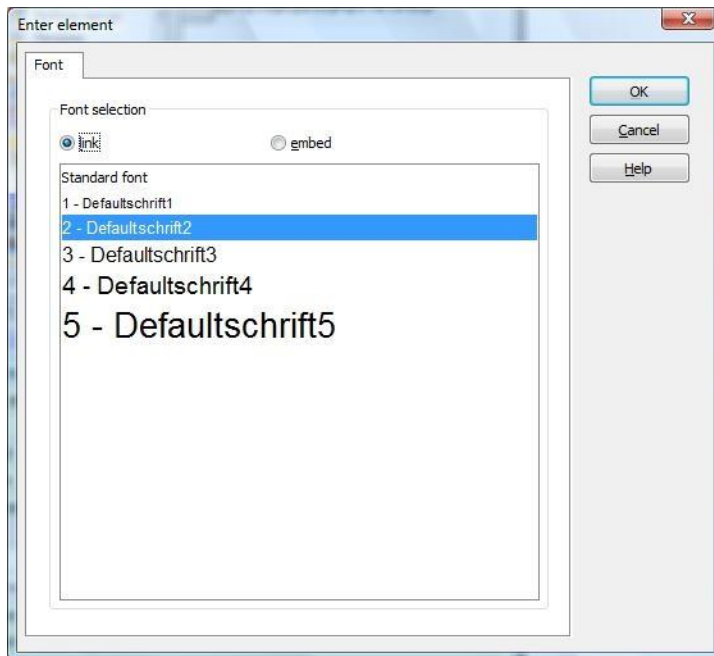
14.4 Linking fonts to elements

There are two possibilities to link a font to a dynamic or vector element (e.g: Text) (on page 118).

Parameters	Description
Drag&Drop	The table in the detail view has the following structure: Numbers, font lists and fonts After clicking the number of the desired font, it can be linked to the element with Drag&Drop.
Properties	It is also possible to link the font in the properties of the selected element. Under 'Representation/Font' the dialog 'Enter element' is opened.

14.4.1 Embedded and linked fonts

Fonts can either be embedded in elements or linked to them.



Parameters	Description
link	Fonts are linked by default.
embed	<p>For the <code>static text</code> vector element, there is the possibility of embedding the font. The font is then no longer linked to a font list, but is instead local and only configured for this element.</p> <p>Attention: This does not mean that the font is embedded in the screen and is thus always displayed correctly. The font must continue to be present in the system that is displaying it.</p>



Information

Scaling of symbols:

*If the symbol contains a **static text** element and is embedded in this element as text, then this text:*

- ▶ Is scaled in the Editor
- ▶ Is not scaled in Runtime

This only applies to symbols. Embedded text is neither scaled in the Editor nor in Runtime in all arrangements.

14.5 ClearType

ClearType fonts can improve the legibility of fonts on LCD screens in native resolution. Windows standard fonts are often better suited to CRT monitors and LCDs with an interpolated resolution. You can define whether ClearType fonts are used in the project properties: Nodes Graphical design -> Screens -> ClearType fonts.

ACTIVATION OF CLEARTYPE

- ▶ If ClearType is active in the operating system, ClearType is used regardless of the setting in zenon.
Exception: DirectX can switch Cleartype on or off directly.
- ▶ If ClearType is not active in the operating system, the setting in zenon is decisive.

Setting	Settings of Graphics quality property	Description
Active (default)		ClearType fonts are used.
Inactive	Windows basic	Windows standard fonts are used. Clear Type must also be deactivated in the operating system with Windows Vista and Windows 7.
	Windows extended	
	DirectX software	Cleartype can be switched on or off regardless of the operating system
	DirectX hardware	

Attention: Changes in the setting only become effective after the Editor is restarted.

15. Symbols

Symbols are screen elements to which vector and dynamic elements are assigned as screen macros. The color attribute of a symbol can be changed by means of dynamic elements (status element, multi-binary element and combined element) in Runtime.

zenon distinguishes between three symbol libraries:

Symbol library	Property
General symbol library	<p>Symbols are available in all projects. The general symbol library node is located in the project manager below the currently-loaded projects.</p> <p>Label when linking in the screen: [symbol group]/[symbol name]</p> <p><u>Rules:</u></p> <ul style="list-style-type: none"> ▶ The variable dialog offers all projects of the workspace for linking. ▶ These symbols are saved in the zenon program folder and only updated when the Editor starts. These symbols are not saved during project backup.
Symbol library the global project	<p>Symbols are available for all projects of the workspace.</p> <p>Label when linking in the screen: (gt) [symbol name]</p> <p><u>Rules:</u></p> <ul style="list-style-type: none"> ▶ The symbols copied into the symbol library of the global project retain their variable linking without changes. ▶ The variable dialog offers all projects of the workspace for linking. Linked variables are placed in front of the name of the respective project. ▶ The name of the Variable can be amended in the properties window. This way, for example, the prefix can be deleted with the project origin. ▶ The symbols are also backed up when a project is backed up.
Symbol library the project	<p>Symbols are only available in the current project.</p> <p>Label when linking in the screen: [Symbol name]</p> <p><u>Rules:</u></p> <ul style="list-style-type: none"> ▶ The symbols are saved in the project folder. The project symbol library is in the current project in the Screens node and is backed up together with project backup.

Symbols can be copied by dragging & dropping.

- ▶ From the **general symbol library** into the **symbol library in the global project**
- ▶ From the **symbol library in the global project** into the **symbol library in the project** or vice versa

Direct copying from the **symbol library** into the **symbol library in the project** or copying from the project or global project into the **general symbol library** is not possible.

In order to be able to work with both libraries at the same time, the preview of the libraries is displayed in separate windows. In doing so, the names of the libraries are displayed in the tabs on the main screen.



Information

Scaling of symbols:

*If the symbol contains a **static text** element and is embedded in this element as text, then this text:*

- ▶ Is scaled in the Editor
- ▶ Is not scaled in Runtime

This only applies to symbols. Embedded text is neither scaled in the Editor nor in Runtime in all arrangements.

SCREEN SYMBOLS AND SYMBOLS FROM THE GENERAL SYMBOL LIBRARY

- ▶ Screen symbols are created in the screen and can only be edited there. They are linked in the library or embedded in screens.
- ▶ Symbols from a library are edited in the library and linked in the screen.



Attention

*Symbols from the **General symbol library** are saved locally in their own file (*.sym) in the zenon program folder. These files must always be added manually to back-up the project with multi-user projects and when forwarding projects. Symbols from the symbol library in the local project and the global project are automatically included in the respective project backup.*

Hint: Always save symbols locally.

PROJECT MANAGER CONTEXT MENU

Menu item	Action
Export XML all..	Exports all entries as an XML file.
Import XML	Imports from an XML file.
Open in new window...	Opens a new window to view and edit the variable. (Default: at the bottom of the Editor.)
Help	Opens online help.

CHECKING LINKED SYMBOLS

Linked symbols are checked to see if they are present and correct:

- ▶ when the Runtime is compiled
- ▶ when the Editor is closed and new Runtime files are created

Missing symbols are marked red in the output window. The error message shows the name of the affected screens and symbols.

MENU SYMBOLS

As soon as a symbol is activated in a symbol library, the screens menu item is replaced by a symbol in the tool bar.

Possible actions are:

Menu item	Action
Save symbol	Saves the current symbol.
Save all symbols	Saves all symbols.
Change symbol size / background color	<p>Opens the dialog for configuration (on page 307) of symbol size and background color.</p> <p>Note: Changes of the background color always affect all symbols in the global system library.</p>
Tool bar	Opens a list of all symbols, used in the current screen. For each symbol its graphical components are listed.
Full screen mode	<p>The full-screen hides all remaining windows and shows only the main window with all opened documents (screens, reports, ...) in full-screen mode.</p> <p>The full-screen mode can be closed by:</p> <ul style="list-style-type: none"> ▶ the displayed button for closing the full-screen mode ▶ the short key <code>Shift+F9</code> ▶ the key <code>Esc</code>
Redraw symbol	Refreshes the display.
Display grid	Switches the grid on or off.
Use grid	<p>Switches usage of the grid on or off.</p> <p>On: All objects are automatically aligned with the grid.</p>
Use magnetic points	<p>Switches magnetic points on or off.</p> <p>Use: If you move an object near the handling point of another object, it snaps in place at the handling point.</p>
Change order for focus	<p>Opens drop-down list for definition of horizontal or vertical order for Keyboard operation.</p> <p>Order for left/right: Determines the horizontal order.</p> <p>Order for up/down: Determines the vertical order.</p>
Zooming	Changes the resolution in fixed steps between 15% and 400%.
Screenshot print current symbol	The current symbol is printed on the default printer. Set printer properties via <i>File -> Standard configuration -> standard</i> .

Insert vector graphics	Opens the dialog for inserting an external vector graphic.
------------------------	--

15.1 Symbol detail view toolbar and context menu

The symbol library can be operated from the context menu or the toolbar:



COMMANDS IN THE CONTEXT MENU AND TOOLBAR

Tool bar	Context menu	Function
1	Symbol new	Creates a new symbol.
3	Open symbol	Opens the symbol in the symbol editor for editing purposes.
2	Symbol group new	A new symbol group is created and can be filled with selected symbols from the library or with self-defined symbols. (Copy and Paste). Only available in the global symbol library.
4	Insert symbol as embedded symbol in the screen	Embeds the symbol in a screen (for details, see subchapter Embedded symbols (on page 315)).
5	Insert symbol as linked symbol in the screen	Links the symbol in a screen (for details, see subchapter Linked symbols (on page 316)).

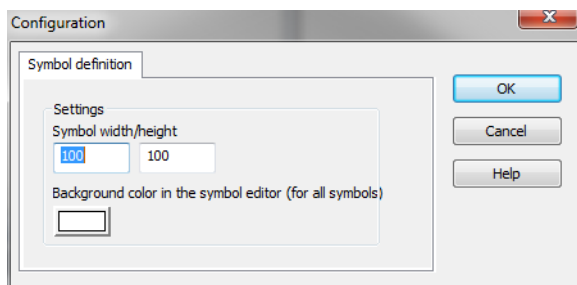
13	Flat view	<p>Arranges all symbols in a flat view. Facilitates the search for certain symbols.</p> <p>Note: In this view, you can't create nor delete symbols and it is also impossible to copy or insert symbols from the clipboard.</p>
14	Hierarchical view	Sorts all symbols hierarchical in subgroups and shows dependencies.
6	Copy	Copies the selected symbol to the clipboard (only hierarchical view).
7	Paste	Inserts the copied symbol in the active group (only hierarchical view).
8	Delete	<p>Deletes the selected symbol or symbol group (only hierarchical view).</p> <p>Attention: Deleting cannot be undone!</p>
9	Edit selected cell	Opens the selected cell for editing. The binocular symbol in the header shows which cell has been selected in a highlighted line. Only cells that can be edited can be selected.
10	Replace text in selected cell	Opens the dialog for searching and replacing texts.
11	Properties	Opens the Properties window for the selected entry.
12	Expand/reduce nodes	Allows expansion/reduction of the selected node or all nodes in the hierarchical view.
15	Export selected XML	Opens the dialog for XML-export of the selected symbols. (For details, see chapter Import/Export of symbols.)
16	Import XML	Imports symbols from an XML-file (see chapter Import/Export of symbols).
18	Remove all filters	Removes all filter settings.
19	Help	Opens online help.
17	Jump back to starting element	Jumps back to the starting element (only toolbar).
	Symbol bar options	<p>Clicking on the arrow opens the submenu:</p> <p>Active: Tool bar is displayed</p> <p>If the toolbar is not displayed, it can be activated using the Menu Options -> Toolbar.</p>

		<p>Note: For free placed tool bar (undocked from the Editor) options are not displayed. The tool bar can be closed by clicking on button X.</p>
--	--	--

15.2 Configure size and background color

To configure the symbol size and background color:

1. Select the symbol in the context menu or in the, in the **Symbol** menu, the **Change symbol size/background color ...** command
2. The dialog for configuration is opened



Parameters	Description
Symbol width/height	Input of the height and width of the symbol in pixels.
Background color	<p>Defines background color. Clicking on Color opens the palette.</p> <p>Note: Changes of the background color always affect all symbols in the global system library.</p>
OK	Applies changes and closes dialog.
Cancel	Discards changes and closes the dialog.

15.3 Release properties from link

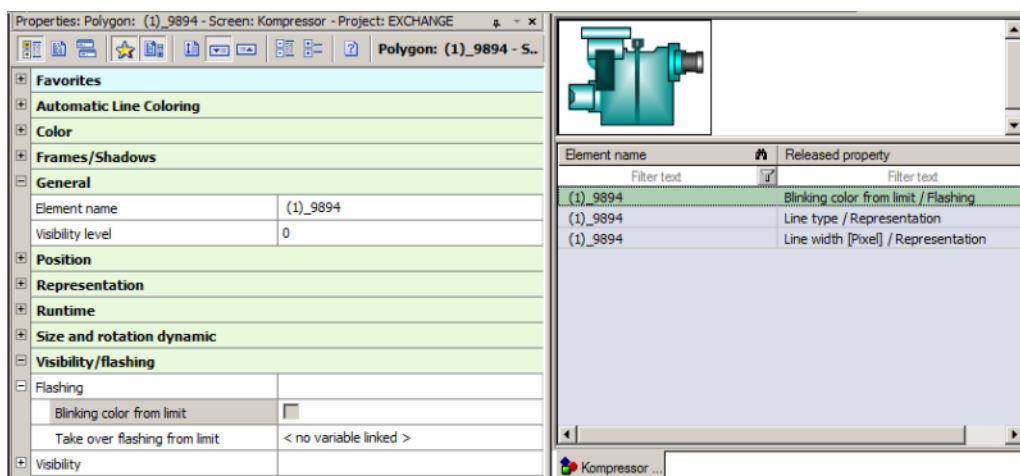
For optimum use of linked symbols, it is sometimes necessary to assign individual values to individual properties from system elements. For example, a motor symbol has a heading in which the name is contained.

You can release the `Text` property with this function. If the symbol is dragged onto the screen, the `Text` property can be changed individually for each motor.

This function is available for all properties.

ENGINEERING

The symbol editor is opened when a symbol is opened. The symbol editor consists of a window divided into two parts to edit the selected symbol.



The symbol is edited in the upper area; in the lower area, the released properties of the element of this symbol are listed. You have different possibilities to release elements:

1. Drag&Drop
 - a) Move the desired properties by dragging & dropping from the property window in the lower area of the symbol editor.
 - b) **Note:** You must always click on the name of the property (not the value) and move it into the release area by dragging & dropping.
2. Property context menu
 - a) Right-click on the name of the property.

b) Select `Release [property]` in the context menu

c) The property is entered in the list

3. Property toolbar

a) Left-click on the name of the property.

b) Click in the toolbar on the release symbol (green arrow upwards above text field)

c) The property is entered in the list

Note: If the entry is not offered or the symbol is displayed as deactivated, the element cannot be released. Possible reasons:

- ▶ No screen element selected in the symbol editor
- ▶ Property was already released
- ▶ Element does not support release (ActiveX, for example)

The release area is a list that can be filtered. You can filter according to individual properties as needed. A context menu is available for all actions.

CONTEXT MENU FOR RELEASE LIST:

Parameters	Description
Remove selected property	Removes release of the element.
Undo	Revises last action.
Help	Opens online help.

EDITING RELEASED PROPERTIES

If the symbol is displayed in a screen, the additional node `$_Element Name` is available. All properties that have been released individually have been released. These are separated from the linking principle (released) and only concern this symbol if changed. If a property of one of the elements is selected in the **Properties** window, this element flashes in the screen.

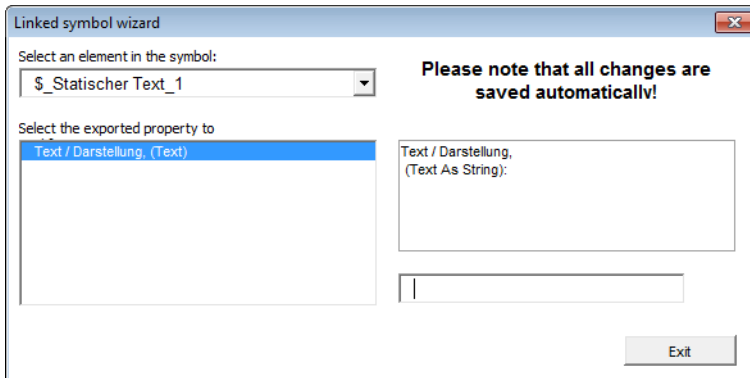
The released properties can be changed:

- ▶ With the properties in the `$_element_name` branch
- ▶ with the Linked Symbol Wizard

LINKED SYMBOL WIZARD

The linked symbol wizard is available to you in order to edit released properties easily and with a clear overview:

1. Double click on a symbol that:
 - a) Is linked in the screen and
 - b) has released properties
2. The Linked Symbol Wizard opens
3. Select the property to be changed
4. Enter the new value
Note: Each change is accepted immediately!
5. Close the wizard by clicking on **Exit**



Parameters	Description
Select an element in the symbol:	Selection of an element in the symbol from the drop-down list.
Select the exported property to	Selection of the released property from a list.
Display of property	Display the property to be changed-
Input field	Input of the new value of the property by means of text entry/number entry, drop-down list or selection dialog - depending on the property.
Exit	Closes wizard



Information

The wizard does not support all possible symbol properties.

15.4 Create and delete your own symbols

Create symbols either in the symbol editor or in a screen. Elements of a symbol can be:

- ▶ Vector Elements
- ▶ Dynamic elements
- ▶ other symbols: Symbols can be inserted into other embedded symbols



Information

Elements contained in a symbol should only be placed within the symbol area and not jut out. If elements jut out over the symbol borders, artifacts may occur at the display in the Runtime. This is also true for elements using symbols (e.g. combi element).

IN THE SYMBOL EDITOR:

1. select **New symbol** in the context menu or in the tool bar
2. Click in the **Element Name** cell and assign a name (periods are not permitted in symbol names)
3. Create the symbol in symbol editor
4. add any individual properties (see sub-chapter on releasing inherited properties (on page 308))
5. save the symbol

ON THE SCREEN:

1. select one or more element on the screen

2. In the context menu, select *Symbol -> Create Embedded Symbol* (or *-> Insert into Existing embedded Symbol*)
or in the menu *Edit-> Symbol -> Create Embedded Symbol*
3. save the symbol



Attention

Fonts and graphics in symbols for use throughout the project:

Fonts: fonts are defined through their ID. Ensure that the same ID is assigned to the desired font in all projects in which the symbol is used.

Graphics: Graphics embedded into a symbol are not saved with the symbol. The corresponding graphics must be copied manually to the graphics library of the corresponding project.

EMBED SYMBOLS INTO SYMBOLS OR LINK SYMBOLS TO SYMBOLS

You can also embed or link existing symbols when creating symbols in a similar manner to the screens (see *Insert symbol into screen* (on page 314)). In doing so, you must heed the following rules:

- ▶ A symbol may not contain any recursion i.e. it may not link to itself!
- ▶ Project symbols may not be linked across projects!
- ▶ Symbols from the global library may not contain any links to project symbols.



Information

You can only edit the contents of symbols in the symbol editor. If you insert an embedded symbol into a screen, you cannot edit the symbol in the screen editor.



Attention

You can only link symbols from the project library within the respective project. It is not possible to link symbols from the project library across projects. To use a symbol from another project library in another project, you can embed it.

DELETE OR REMOVE

To delete a symbol:

1. highlight the symbol in the library
2. select **Delete** in the context menu or in the tool bar

To remove an embedded symbol in a new screen:

1. highlight the symbol in the library
2. In the context menu, select *Symbol -> Remove*
3. the symbol is removed in its elements
4. if the symbol for the symbol library has already been inserted, it remains there unchanged; it is deleted from symbol administration however

To delete a linked symbol:

1. highlight the symbol in the library
2. select *Delete* in the context menu.
3. the symbol remains unchanged in the symbol library, however it is deleted from symbol administration



Information

To edit individual elements of a symbol without removing the symbol assignment, select:

- ▶ for linked symbols: **Edit in symbol editor**
- ▶ for embedded symbols: **Single edit mode symbols / elements**

15.4.1 Transferring your own symbols to the library

You can also transfer symbols that you have created on the screen into a symbol library:

1. In the context menu, select the symbol *Symbol -> Insert into symbol library*
2. the dialog for symbol definition opens
3. Select the desired symbol library and the appropriate folder
4. confirm the dialog with **OK**
5. change to the symbol library selected
6. the symbol was entered with the element name **Embedded symbol_No**
7. name it as you wish
8. To continue editing the symbol or to allocate it individual properties(see Release Inherited Properties), (on page 308) open the symbol by double-clicking on it or via the **Open Symbol** context command in the symbol editor



Information

A symbol that was created from an element and a linked symbol cannot be accepted into the symbol library. To be able to insert the symbol:

- ▶ Convert the linked symbol into an embedded symbol
- ▶ Create a new symbol from the element and the embedded symbol

This symbol can now be inserted into the symbol library.

15.5 Add symbols to screen

Symbols can be inserted into a screen in two ways, as

- ▶ Embedded Symbols (on page 315): These are no longer connected to the symbol in the library, changes to the original symbol have no effect on the embedded symbol.

- ▶ **Linked Symbols** (on page 316): These remain linked to the original symbol. Changes to the symbol also change the symbol in the screen.



Attention

You can only link symbols from the project library within the respective project. It is not possible to link symbols from the project library across projects. To use a symbol from another project library in another project, you can embed it.



Information

*If you have activated the **Frame** around dynamic elements in the **Editor** property, you can distinguish between embedded symbols and linked symbols at a glance. An arrow symbol is displayed in the upper right corner for linked symbols. You find this property under **Options** -> **Settings** in the **Settings** area.*

15.5.1 Embedded symbols

This is how you embed a symbol into a screen:

- ▶ hold down the `ctrl` key and move it by dragging & dropping
- or
- ▶ select the **Insert symbol as embedded symbol** symbol in the context menu to embed the symbol into the current screen

Embedded symbols can then be resolved to their individual elements or their elements can be edited. To do this, select **Symbol -> Change to individual editing mode** in the context menu or **Edit-> Symbol -> Symbol/element individual editing mode** in the menu.

These symbols do not change, if the original symbol in the library is changed, as they are no longer linked to it.

REPLACE LINKED VARIABLES

The dialog to replace variables and functions opens when embedding a symbol. Here, you can automatically replace the elements present with those you want for the linked symbol. You can find details on automatic replacement of variables and functions in the chapter on Replace links in the Editor (on page 242).

To replace variables in symbols that have already been inserted, select the **Replace Links** command in the context menu.

Hint: Ensure that the variables are named (on page 241) clearly and sensibly from the start.

15.5.2 Linked symbols

Linked symbols do not save variables that are physically present in the symbol library, only variable names. When inserting variables into a screen as a link, the variable names saved in the symbol can be assigned to variables from the project. If the project is given a variable that corresponds to a variable name saved in the symbol, this is linked automatically - without an extra rule.

INSERTING A SYMBOL WITH LINKING

This is how you link a symbol to a screen:

- ▶ move the symbol by dragging & dropping it into the screen
- or
- ▶ select the Insert symbol as linked symbol symbol in the context menu to link the symbol into the current screen

Linked symbols are only saved in the screen as links. Each change of the symbol in the library has a direct effect on the symbol on the screen. For example, if a dynamic element is added to a symbol, it is available in all screens in which the symbol is used.

Exception: Changes to the symbol size only have an effect on the screen of the symbol Original Size is selected in symbol properties `Graphic size`.

With embedded symbols, you can:

- ▶ turn them into embedded symbols: Context menu Symbol -> Convert Linked Symbol to Embedded Symbol
- ▶ Edit them in symbol editor: Symbol -> Edit in Symbol Editor

- insert them into an embedded symbol: Symbol -> Insert into Existing Embedded Symbol

Linked symbols cannot be resolved in their elements and their elements cannot be changed in **Edit elements** (context menu -> *Symbol -> Change to individual editing mode* mode or the *Edit -> Symbol -> Symbol/element individual editing mode* menu).



Attention

With linked symbols, use only embedded fonts, because linked fonts are not scaled with the symbol. The position of the text would move in relation to the graphics in the symbol.

Replacing linked variables or linked functions

When embedding a symbol that contains variables, the dialog to replace variables and functions opens. Here, you can automatically replace the elements present with those you want for the linked symbol. ALC aliases that are die used in elements in the symbol can also be replaced. Several entries are separated by a semicolon (;).

You can also get to this dialog using the **Preview** property in the **Linking** rule node of the element.



Information

*The process for symbols can also be applied to **faceplate** (on page 421) screen containers. The same properties and rules apply. Exception: The **Hierarchical names** property is not available.*

REPLACING LINKED VARIABLES OR LINKED FUNCTIONS

Enter element

Edit linking rule

Linking rule

Source (with '*' or '?') Example: Tank1*

Replace by Example: Tank2 Preview


All variables that start with Tank1 are replaced by Tank2, for example: Tank1.Temperature is replaced by Tank2.Temperature

Replace variables using Options

☒ Name ☐ Identification ☒ Case sensitive ☐ Combined names

Preview

To the variables and functions to be substituted by the source/target texts

Source	Target
 Start	Start

Property	Description
Linking rule	Configuration of which character sequence can be replaced and how.
Source	Enter the character string to be searched for. Permitted wildcards: * and ? Wildcards are only allowed as prefix or suffix; e.g. *xxx or xxx*.
Replace by	Entry of the character string that is to be replaced.
Name	Swaps information in process variable names.
Identification	Exchanges information in the identification
Note capitalization	When swapping, be sure that any capitalization is an exact match.
Combined names	Permitted combined names. Is not available for ALC aliases and faceplate containers (on page 416). These are always used without a symbol prefix.
Preview	Display of the selected and replaced elements.
OK	Applies settings and closes the dialog.
Cancel	Discards all changes and closes the dialog.
Help	Opens online help.

You can find further details on automatic replacement of variables and functions in the chapter on replacing linking of variables and functions (on page 240) .

Hint: Ensure that the variables are named (on page 241) clearly and sensibly from the start.

COMBINED NAMES

If the `Hierarchical names` property in the `Linking rule` node is active, the names of the linked variables from the object names of the symbol and the variables defined in the symbol are combined. The two names are separated by a dot: `"Symbolname.Variable"`



Example

*Variable name: **Motor.Speed***

*The symbol object name is "**Motor**". The dynamic element that is used in the symbol has the placeholder "**Speed**" as a linked variable.*

*The placeholder "**Speed**" can be easily typed in for the symbol property when creating the variable.*

Combined names also work with nested symbols:

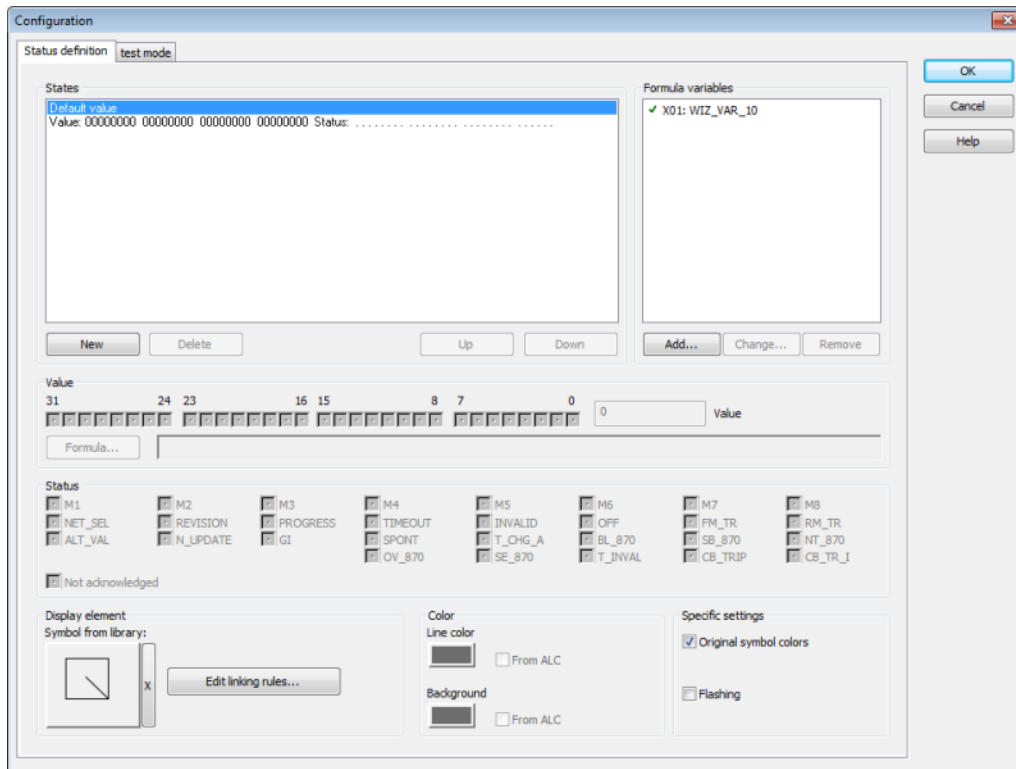
*If you have a "**Pump**" symbol, which in turn contains a "**Motor**" symbol and a "**Convertor**" symbol with the variable placeholder "**Output**", then the linking works if there is a **Pump.Motor.Output** variable and a **Pump.Convertor.Output** variable.*

15.5.3 Symbol selection in the Combined element

To link combined elements with a symbol:

1. select **Symbol from library** in the combined element properties in the Representation node in the Type of display property
2. Click on Configuration and test
3. the configuration dialog opens:

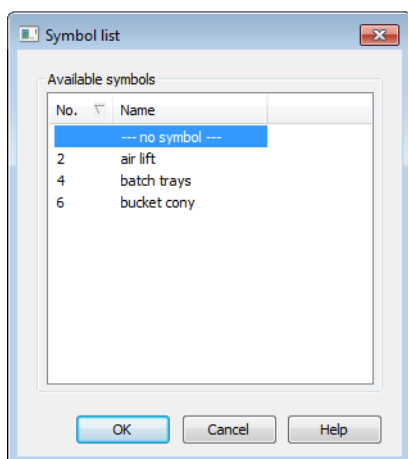
The general settings for all display types can be found in the chapter on statuses (on page 65).



Parameters	Description
Display element	
Symbol from library	<p>Clicking on the symbol opens the dialog to select a symbol.</p> <p>Clicking on the X next to the symbol deletes the selected symbol.</p>
Edit linking rule	<p>Variables and functions contained in the symbol can be exchanged with the help of linking rules.</p> <p>Attention: If a variable or function does not fit into the scheme, that link cannot be replaced.</p>
Colors	Only active if the Original Symbol Colors property in Specific Settings is turned off.
Color	Choice of color.
Fill color	Choice of fill color.
From ALC	The color of the linked source is used.
Specific settings	
Original Symbol Colors	<p>Active: Transfers original color from symbol.</p> <p>Deactivates Take color of main variable property.</p>
Flashing	Active: Symbol flashes in runtime if status has been achieved.

15.6 Symbol list

Via *Edit -> Symbol ->Symbol list...* Open a list that displays all symbols of the active screen:



Title	Contents
no .	Symbol number
Name	Name of the symbol

You sort the symbols according to number or name by clicking on the respective column title. A symbol selected in the list of symbols is blinking in the screen.

15.7 XML export and XML import

Import/export of symbols is possible from the project and the global symbol library. Single or selected symbols or the entire library can be imported or exported. The path for the export can be defined freely.

EXPORT SYMBOLS

To export symbols:

1. highlight the desired symbols
2. select **Export selected XML...** in the context menu of the detail view
 Alternate: select, in the context menu of the **project symbol library** node, the **XML export all...** command

3. the selection dialog for the saving location is opened
4. select the desired saving location
5. assign a name
6. pay attention to file type XML
7. confirm by clicking on the **Save** button

The selected symbols are exported to an XML file and can be imported in this or in other projects at any time.

IMPORT SYMBOLS

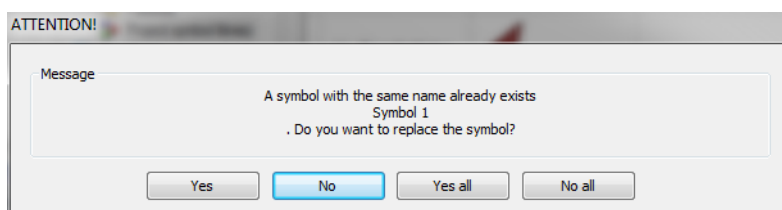
To import symbols:

1. in the context menu of the node or the detail view of the **Project symbol library** or in the detail view of the **Global symbol library** select **Import XML...** command
2. the selection dialog for the saving location is opened
3. navigate to the saving location of the desired XML file
4. Select the desired file
5. confirm the import by clicking on the **open** button

The symbols are imported.

NAME CONFLICTS DURING THE IMPORT

At the import of a symbols the name (attribute **shortName**) which is stored in the XML file is used for the name of the symbol which is created. If a symbol with the same name already exist, the import is halted and an error message is displayed:



Parameters	Description
Yes	The symbol described in the error message is replaced by the symbol from the XML file at the import. If a new conflict occurs, the error message is displayed again.
No	The symbol described in the error message is not imported. The existing symbol is maintained. If a new conflict occurs, the error message is displayed again.
Yes, all	The symbol described in the error message is replaced by the symbol from the XML file at the import. This setting is used automatically when errors due to using the same name occur. All affected symbols are replaced.
No, all	The symbol described in the error message is not imported. The existing symbol is maintained. This setting is used automatically when errors due to using the same name occur. All affected symbols are maintained.

Note: Only the `shortName` is used. The file name does not matter for the name of the symbol which should be imported. Thus it cannot be used to solve the conflict.

16. Visibility levels

Similar to CAD programs, you can define visibility levels in the Editor and allocate them with unique elements. That way you can easily hide unused elements in complex images and show them again anytime. 15 visibility levels are available. Levels are allocated using the properties `Visibility level` in the `nodeGeneral`. Unique levels can be activated and deactivated using the buttons of the toolbar **visibility levels**:



Symbol (from left to right)	Function
Show all visibility levels	Shows all levels.
Hide all visibility levels	Hides all levels.
Visibility level<No.>	Shows / hides the relevant visibility level.
Symbol bar options	<p>Clicking on the arrow opens the submenu:</p> <p>Active: Tool bar is displayed</p> <p>If the toolbar is not displayed, it can be activated using the Menu Options -> Toolbar.</p> <p>Note: For free placed tool bar (undocked from the Editor) options are not displayed. The tool bar can be closed by clicking on button X.</p>



Information

Visibility levels only apply to the Editor and have no effect in Runtime.

Note on control elements: Control elements are always displayed at the uppermost position. That also applies if they are covered by other elements in the Editor. This ensures that they can always be reached.

17. Screen types

Screens are created in the basic setting with the **Standard** screen type. A drop-down list can be used to select special screen types for the properties in the screen properties.



Attention

If a type is changed from a standard type to a special type, the new screen type is fixed with the screen and can no longer be changed.

SPECIAL SCREEN TYPES

zenon offers a range of special screen types (on page 327) for special tasks. After selecting a special screen type, all user elements for the respective screen type are available in the **Control elements** menu. Menu item **add template** (on page 331) opens a selection dialog for adding pre-defined layouts with certain control elements at pre-defined locations.



Information

Special screen types need only be created once, even when used multiple times. They can be opened with different data by means of the screen switching function.

SPECIAL SCREEN TYPES AS A START SCREEN

Each screen type can also be used as a start screen in theory.

Attention: Special screen types are opened with an empty filter and thus no data are opened.

17.1 Special screen types

Special screen types in zenon:

Screen type	Description
Active Directory User Administration (on page 338)	Allows the administration of the Active Directory users and user groups in Runtime.
Alarm Message List	Collects alarm messages and displays them in list form.
Alarm Message List Filter	filter for the Alarm Message List.
Equipment model (on page 342)	Switch equipment models as a screen in Runtime.
Archive revision	Display of saved archive values in a table and editing of these ATTENTION: Only available if the Historian is licensed.
Batch	Creating defaults for master recipe in module Batch Control. ATTENTION: Only available if Batch Control is licensed.
Command	Display of command. ATTENTION: Only available if the Energy Edition is licensed.
Chronological Event List	Collects process events, system events and user defaults and displays them in list form.
Chronological Event List Filter	Filter for the Chronological Event List
Energy Management System	planning and display of energy use management (electricity, gas). ATTENTION: Only available if the Energy Management System is licensed. Note: Not available under Windows CE.
Extended Trend	Displays online and archive values as diagrams.
Faceplate (on page 416)	Incorporates several screens of a different type into one screen.
Energy forecast	Screen for the display of Energy forecast ATTENTION: only available if SICAM 230 is licensed.
HTML (on page 441)	Makes it possible to display a screen in HTML, customized for Microsoft Internet Explorer.
Industrial Maintenance Manager	Display of maintenance information. ATTENTION: Only available if the Industrial Maintenance Manager is licensed. Note: Not available under Windows CE.

Industrial Performance Analyzer	Analyzes alarms in order to localize weak points (downtime) of equipment. Note: Not available under Windows CE.
Keyboard	Creates a freely definable virtual keyboard.
Login	Individual design of a login window.
Message Control	Screen for managing the message queue in Message Control.
Notepad (on page 445)	Displays protocols and text files which were created from database requests or existing text files.
Production & Facility Scheduler	Administrates schedules and profiles. ATTENTION: Only available if the Production & Facility Scheduler (PFS) is licensed.
Report Generator	For the output of reports that are produced by means of the extended Report Generator. ATTENTION: Only available if the Report Generator is licensed. If you only want to display reports but not edit them, you do not need a license for Runtime.
Report Viewer	Serves to display RDL reports for Archive, AML, CEL and online values. ATTENTION: only available if reporting is licensed.
Recipegroup Manager	Administrates recipes and their use within a recipe group. ATTENTION: Only available if the Recipegroup Manager (RGM) is licensed.
S7 graph	is used for sequential chains with alternative or parallel step sequences (SFC). Displays the current status of chain control in the PLC in runtime.
Standard recipes	Administrates recipes
Variable diagnosis	Displays variables in Runtime and sends set values to the hardware Note: Not available under Windows CE.
Video (on page 447)	Displays online and saved videos (*.avi). Note: Not available under Windows CE.
Worldview Overview	Makes it possible to scroll standard screens which are larger than the screen resolution.

Time filter	Enables general filter settings to be set for lists. The lists that are controlled by this are defined in the screen switching function.
-------------	--

17.1.1 Create special screen types

To create a special screen type:

1. create a new screen or select an existing screen of the type `Standard`
2. click on the predefined `Standard` type in the properties in the `Screen type` at `General` node

Alternatively: In the `screen` detail view, click on the screen type of the elements and select the desired screen type from the drop-down list

3. Select the desired screen type from the drop-down list.
4. select the desired control elements in menu `Control elements`
 - `Add template` (on page 331) opens a selection dialog for adding pre-defined layouts with certain control elements at pre-defined locations.
 - Elements that are already present on the screen are displayed in gray and can no longer be selected



Information

Limitation for automatic insertion of the template:

If there is already a static element, such as a control element, in the screen, no frame or frame text is inserted when inserting the default control elements.

Recommendation: Insert, after creating a special screen type in the first stage, the default control elements from the template and then further elements.

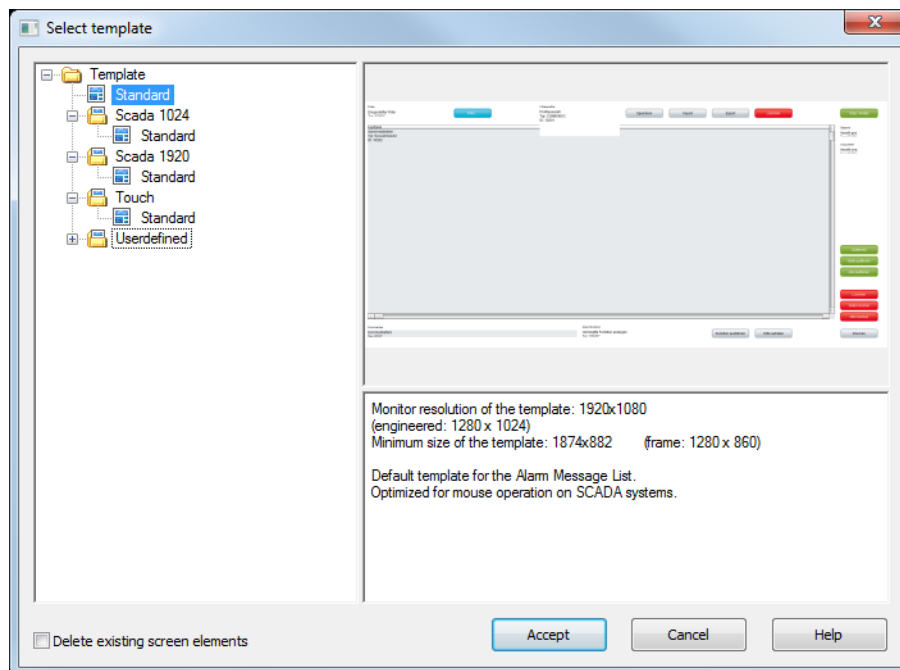
17.1.2 Template for standard screens and special screen types

For special screen types and also for standard screen you can use templates for automatic inserting and positioning elements. Templates can be created from every screen by yourself. For special screen types pre-defined templates are shipped with zenon.

Templates are stored as compressed zip files which include three files:

- ▶ Meta data: XML file with the description of the template (name, description, size, etc.).
- ▶ Screen elements: XML file with the exported elements of the screen.
- ▶ Preview: Bitmap file with a preview of the template.

SHIPPED TEMPLATE



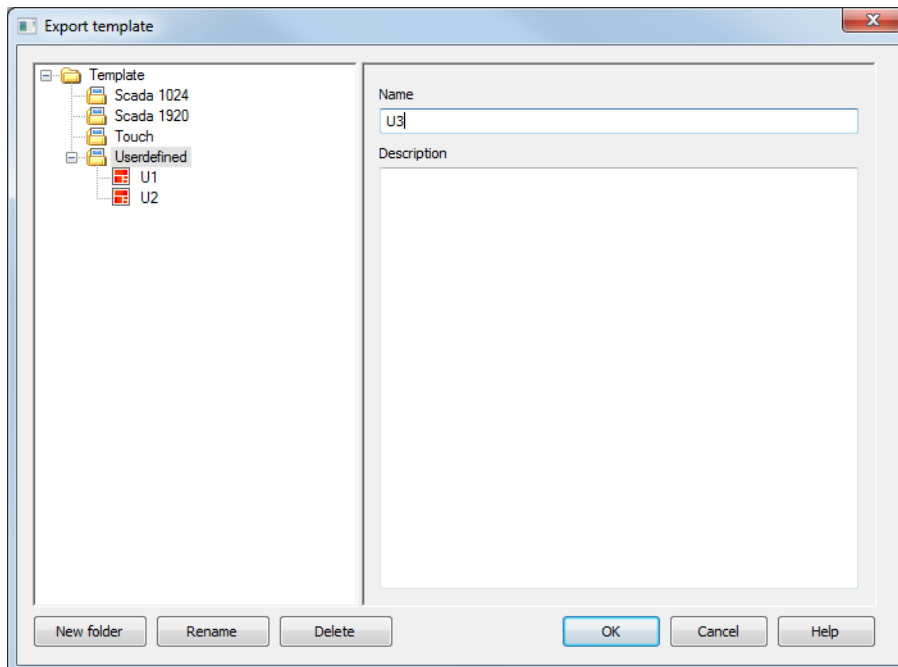
The shipped templates are available in different resolutions and also optimized for touch screens. These templates cannot be changed or deleted. Pre-defined templates by COPA-DATA are saved in the zenon program folder under: `\Templates\ScreenTypes\[LANGUAGE]\[name of the screen type]\[Dateiname].zip`.

Example: You can find the english templates for the Alarm Message List under `%Program Files (x86)%\COPA-DATA\zenon 8.6\Templates\ScreenTypes\ENGLISH\Alarm Message list\`

Note: Only templates for the currently-set language are loaded.

USER-DEFINED TEMPLATE

Users can create and save templates for all screen types. They can also be edited and deleted.



User-defined templates are saved in the zenon data folder: `Templates\ScreenTypes\<name of screen type>\<file name>.zip`.

e. g.: `%ProgramData%\COPA-DATA\zenon700\Templates\ScreenTypes\Alarm Message List\3e9afbcf-f93d-46d9-a199-e00effe4811c.zip`.

Note: The path depends on whether it is registered at the installation or via the Startup Tool. If the latter is the case, the current program folder is used as data folder.

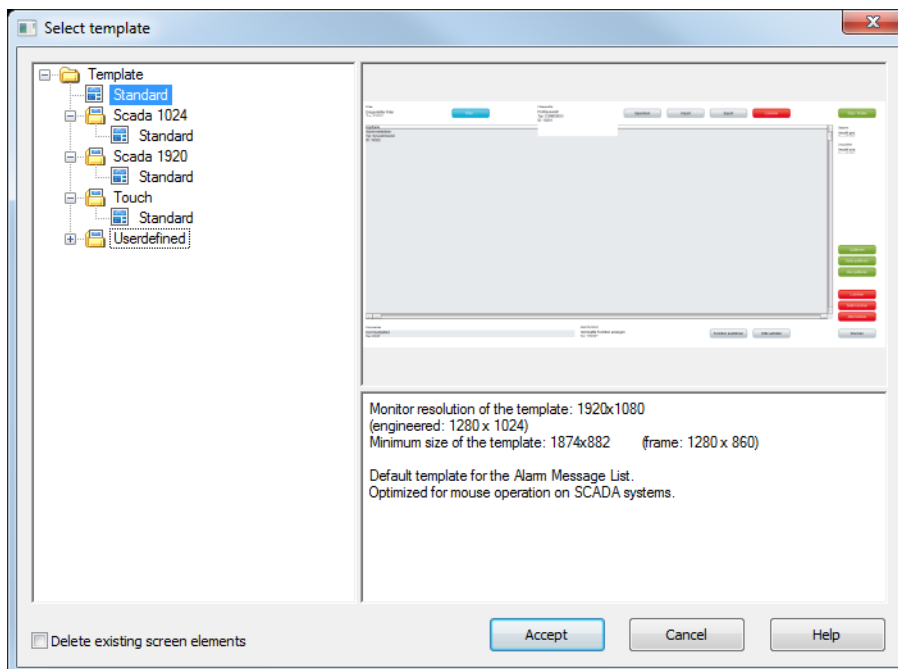
Use templates

To use templates for a screen:

1. open the screen
2. select **Add template** in the control element menu
3. the dialog for selecting pre-defined and user-defined templates is opened

Note: for screen of type Standard only user-defined template are available

4. select the desired templates
5. Click on **Accept**
6. the elements defined in the templates are inserted at the pre-defined location



Parameters	Description
List field templates (left)	Displays all pre-defined and user-defined template.
Preview to template (top right)	Preview of the screen at taking over the selected template.
Description template (bottom right)	Description of the template.
Delete existing screen elements	Active: Already existing elements in the screen are deleted when taking over the template.
Apply	Inserts the elements of the selected template in the screen and closes the dialog.
Cancel	Closes dialog without inserting elements.
Help	Opens online help.

Create templates

Folders and template can be newly created, deleted, renamed and moved for user-defined templates. Shipped, pre-defined templates cannot be changed or deleted.

CREATE FOLDER OR TEMPLATE

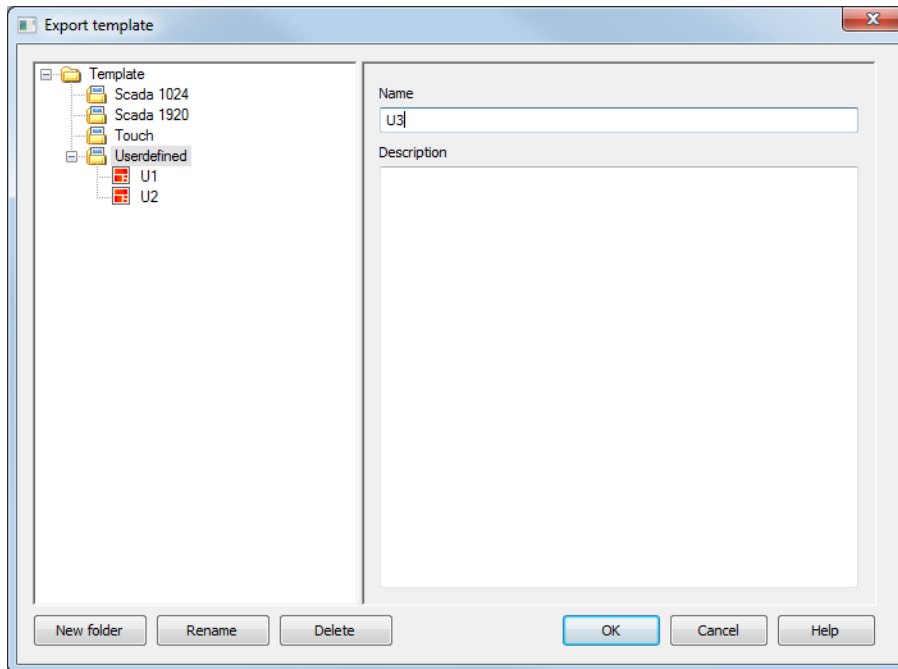
To create a folder, select:

- ▶ button **New folder** in the dialog
- ▶ or command **New folder** in the context menu
- ▶ or use the **Ins** key

To create a template:

1. highlight the desired screen in the detail view
2. select command **Create template for screen type** in the context menu or in the tool bar
3. the dialog for creating own templates is opened
4. select an existing folder or create a new one
5. enter a name for the new template
6. you can add a description as an option
7. confirm this with **OK**.

8. the template is added to the highlighted folder



Parameters	Description
List field templates (left)	Displays all pre-defined and user-defined template. Makes it possible to delete or rename folder and templates and to add folders via the context menu.
Preview to template (top right)	Preview of the screen at taking over the selected template.
Description template (bottom right)	Description of the template.
New folder	Creates a new folder. You can create several levels.
Rename	Opens field with names for editing. This can also be achieved with the <code>F2</code> key or a delayed double click.
Delete	Deletes the selected folder with all subfolders after a confirmation request.
OK	Create template and closes dialog.
Cancel	Closes the dialog without creating the template.
Help	Opens online help.

DELETE FOLDER

To delete a folder or a template:

1. highlight the folder or template
2. select
 - a) button `Delete` in the dialog
 - b) or command `Delete` in the context menu
 - c) or use the `Del` key

The folder or template is deleted after a confirmation request. For folders possible subfolders including all their templates are also deleted.

RENAME FOLDER OR TEMPLATE

To rename a folder or a template:

- Select the `Rename` command in the context menu

- ▶ or use the **Rename** button
- ▶ or highlight the element and open it by pressing the F2 key or a delayed double click on the text for editing.
- ▶ or at templates change the text in filed **Name**

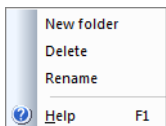
MOVE FOLDERS OR TEMPLATES

Folders and template can be moved via drag & drop with the help of the mouse to other folders.

Context menu create template for screen type

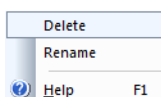
In the dialog for creating new template context menus are also available.

CONTEXT MENU FOR FOLDER



Parameters	Description
New folder	Creates a new folder below the highlighted level.
Delete	Deletes the highlighted folder after a confirmation message.
Rename	Opens the folder caption for renaming.
Help	Opens online help.

CONTEXT MENU FOR TEMPLATES

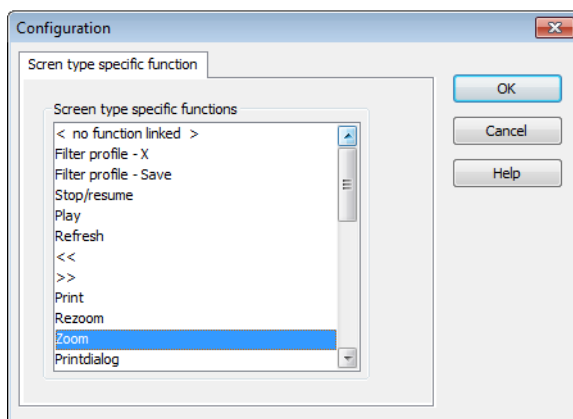


Parameters	Description
Delete	Deletes the highlighted template after a confirmation message.
Rename	Opens the template caption for renaming.
Help	Opens online help.

17.2 Screen type specific functions

If a dynamic element of the **Button** type is created in a screen with a special screen type, `Variable / function` activates additional property `Screen type specific function` is available in properties in the nodes. Therefore the **button** can be assigned special functions, appropriate to the screen type.

For example, in extended trend:



17.3 Active Directory user administration

You can access the Windows Active Directory in Runtime with an `Active Directory user administration` screen. You can create, delete and edit organization units, users and user groups and assign them rights in zenon.



Information

Active Directory, AD LDS and ADAM (for Windows XP) are not available with Windows CE.



Attention

*Rights that are issued in zenon are applicable for the respective project or the workspace.
Rights that are issued in the Active Directory are applicable globally.*

If rights have been issued to users or user groups of the Active Directory, then the rights for these users are applicable in all zenon projects!

CREATING AN ACTIVE DIRECTORY USER ADMINISTRATION SCREEN

To create an Active Directory user administration screen:

1. in the tool bar or in the context menu of node **Screens** select command **New screen**
2. an empty screen of type **Standard** is opened
3. Change the screen type in the detail view; to do this:
 - a) click on **standard** in the **Screen type** column
 - b) Select **Active Directory user administration** in the drop-down list
4. Click in the screen.
5. select menu item **Control elements** from the menu bar
6. Click on **Add template** (on page 331) in the drop-down list.
7. The dialog for selecting a template is opened.
8. Select the desired template (on page 389).
9. Standard elements are placed in pre-defined positions; these can be deleted or positioned elsewhere.
10. You can add further elements using the **Control elements** (on page 379) menu.
11. Name the screen. To do this:
 - a) Click on the screen name in the detail view in the **name** column

b) Give it its own name

12. Create a screen switch function in order to be able to call up the screen in Runtime

ACTIVE DIRECTORY USER ADMINISTRATION SCREEN

Domain name	Domain name Typ: EDIT
User identification	User identification Typ: EDIT
Password	Password Typ: EDIT
	<input type="button" value="Log in"/> <input type="button" value="Logout"/>

Active Directory Explorer
Typ: STATIC
ID: 53509

<input type="button" value="Create new organization unit..."/>	<input type="button" value="Move up"/>
<input type="button" value="Edit organization unit..."/>	<input type="button" value="Create new organization unit..."/>
<input type="button" value="Delete node..."/>	<input type="button" value="New user..."/>
	<input type="button" value="New group..."/>
	<input type="button" value="Objekt edit..."/>
	<input type="button" value="Delete object..."/>

Parameters	Description
Insert template	<p>Opens the dialog for selecting a template (on page 331) for the screen type.</p> <p>Templates are shipped together with zenon and can also be created by the user.</p> <p>Templates add pre-defined control elements to pre-defined locations in the screen. Elements that are not necessary can also be removed individually once they have been created. Additional elements are selected from the drop-down list and placed in the screen. Elements can be moved in the screen and placed individually.</p>
Active Directory window	Control elements for the display and administration of the Active Directory.
Active Directory window	Window in which the structure of the Active Directory is displayed.
Create new organization unit (tree)	Opens the dialog to create a new organization unit in the tree.
Delete organization unit... (Tree)	Deletes the organization unit selected in the tree after requesting confirmation.
One level up	Navigates to one level higher in the structure.
Create new organization unit	Creates a new organization unit below the element selected in the tree. The corresponding dialog is opened:
Create new user	Opens the dialog to create a new user.
Create new user group	Opens the dialog to create a new user group.
Edit object	Opens the dialog to edit the selected object.
Delete object	Deletes the selected object.
Login	Control elements for logging into the Active Directory.
Domain name	Entry and display of the domain name.
User name	Entry and display of the AD user name.
Password	Entry of the password.
Login	Clicking logs the user into the AD.
Logout	Clicking logs the user out.

You can find details on use in zenon and configuration of the Active Directory in the **user administration** manual, in chapters:

- ▶ **Active Directory user administration with zenon Runtime**
- ▶ User administration with Microsoft Active Directory



Attention

*Rights that are issued in zenon are applicable for the respective project or the workspace.
Rights that are issued in the Active Directory are applicable globally.*

If rights have been issued to users or user groups of the Active Directory, then the rights for these users are applicable in all zenon projects!

17.4 Equipment model

With an equipment model screen, the following is possible in Runtime:

- ▶ Other, already-open screens can be filtered for certain equipment groups
- ▶ All functions linked to a certain equipment group are automatically listed consecutively

Filtering for an equipment group always has an effect on the screens that have already been opened. If screens are called up again or reloaded, they are displayed again without the equipment model screen filter.



Information

There are equipment models from global projects and local projects available. In the event of naming conflicts, local equipment projects are preferred.

***Hint:** Ensure that you use clear names when configuring equipment models. For example, give global equipment models a corresponding prefix or suffix. This way you avoid having the same names in local and global equipment models. And you can easily identify the origin of the displayed equipment model in selection lists.*

*You can find details on configuration and use of equipment model screens in the **Equipment modeling** manual in the **Equipment model screen type** and **Filtering in Runtime** chapters.*

17.5 Filter screens

You use filter screens to design individual filter pages with their own filter dialogs. You can do this according to aspects such as touch operation, filtering of special areas only, ability to switch languages, etc.

The following is provided as filter screens:

- ▶ Alarm Message List Filter
- ▶ Chronological Event List Filter
- ▶ Time filter

17.5.1 Creating filter screens

This is how you create filter screens:

- ▶ Alarm Message List Filter (on page 343)
- ▶ Chronological Event List Filter (on page 362)
- ▶ Time filter (on page 377)

Creating an Alarm Message List filter screen

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

Therefore:

- ▶ Only the filter elements that are actually required are configured and provided to the user
- ▶ The user only has these filters displayed and has an overview
- ▶ The appearance can be freely defined and can, for example, ensure ease of use by means of a touch screen.

For details of use in Runtime, see Using the Alarm Message List Filter chapter.

For the definition of filter criteria, see Filter Alarm Message List Filter chapter.



Attention

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

CREATING AN ALARM MESSAGE LIST FILTER SCREEN

To create an Alarm Message List filter screen:

1. Select, in the toolbar or in the context menu of the **Screens** node, the **New Screen** command
2. An standard empty screen is opened
3. Change the screen type in the detail view; to do this:
 - a) click on **standard** in the **Screen type** column
 - b) Select **Alarm Message List filter** from the drop down list
4. Select your own template
(AML filter cannot be based on the same template as other screens)
5. Click in the screen.
6. Select the **Control elements** menu item in the menu bar
7. Click on **Add template** (on page 331) in the drop-down list
8. The dialog for selecting a template is opened
9. select the desired template
10. Select additional elements as required and insert them into the desired place on the screen
11. Name the screen according to the selected filter
To do this:
 - a) Click on the screen name in the detail view in the **name** column
 - b) Select a suitable pre-defined name (on page 391) from the drop-down list it give it a name of your own

12. Create a screen switch function in order to be able to call up the screen in Runtime

Variable filter

Variable name

Only not acknowledged alarms

Variable name

Only current alarms

Identification

Only cleared alarms

Identification

Comment required

Case sensitive

Origin of the data

Ringbuffer

Historic data

Show list without refresh

Max. number:

Input field

Text filter

No text filter

Search for (separate words by Space)

Input field: Search text

Case sensitive

Words do not need to be in the text completely

At least one word must be in the text

All words must be in the text

Filter string must exactly be in the text

Time filter

Filter type

Current time

Combobox: Type of time filter

09:44:58 27.02.2012

Typ: COMBOBOX

Year

Month

Day

Hour

Minute

Second

Combobox: F

Combobox: F

Combobox: F

Combobox: F

Combobox: F

Combobox: F

Typ: COMBO

Typ: COMBO

Typ: COMBO

Typ: COMBO

Typ: COMBO

Typ: COMBO

ID: 10003

ID: 10002

ID: 10001

ID: 10004

ID: 10005

ID: 10006

Until

Year

Month

Day

Hour

Minute

Second

Combobox: U

Combobox: U

Combobox: U

Combobox: U

Combobox: U

Combobox: U

Typ: COMBO

Typ: COMBO

Typ: COMBO

Typ: COMBO

Typ: COMBO

Typ: COMBO

ID: 10009

ID: 10008

ID: 10007

ID: 10010

ID: 10011

ID: 10012

Alarm/event groups

classes, alarm

areas

Alarm/event groups

Alarm/event classes

Alarm areas

Alarm/event groups

Alarm/event classes

Alarm areas

Typ: LISTBOX

Typ: LISTBOX

Typ: LISTBOX

ID: 10074

ID: 10075

ID: 10087

Minimum time active

Day

Second

Minute

Hour

Millisecond

Minimum time al

Minimum time al

Minimum time al

Minimum time al

Minimum time al

OK

Accept

Cancel

Refresh

ELEMENTS

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

Element	Description
Insert template	<p>Opens the dialog for selecting a template (on page 331) for the screen type.</p> <p>Templates are shipped together with zenon and can also be created by the user.</p> <p>Templates add pre-defined control elements to pre-defined locations in the screen. Elements that are not necessary can also be removed individually once they have been created. Additional elements are selected from the drop-down list and placed in the screen. Elements can be moved in the screen and placed individually.</p>
General filter	Drop-down list of different general filters.
Insert all elements: General filter	Inserts all elements from the area of general filters into pre-defined places. Elements can be arranged individually.
Insert all elements: General filter (Touch)	Inserts all elements from the area of general filters into pre-defined places. Elements can be arranged individually. The elements were optimized for touch operation.
Variable filter	Alarms of which variables are displayed:
▶ Variable name	Filter according to names of variables.
▶ Identification	Filter according to identification of variables.
▶ Note capitalization	Note capitalization when filtering the variables.
Type of alarms	Which alarms are displayed:
▶ Only not acknowledged alarms	Only unacknowledged
▶ Only cleared alarms	Only historical
▶ Only current alarms	Only current
▶ Comment required	Alarms that require a comment when acknowledged
▶ Minimum time for current alarms - days	Only alarms that have been current for at least the given number of days.
▶ Minimum time for current	Only alarms that have been current for at least the given

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

Type of alarms (Touch)	<p>Elements optimized for touch operation for the display of alarm type, along the lines of the Alarm type menu.</p> <ul style="list-style-type: none"> ‣ Only not acknowledged alarms ‣ Only cleared alarms ‣ Only current alarms ‣ Comment required ‣ Minimum time active alarms - Button: Days (up) ‣ Minimum time active alarms - Touch box: Days ‣ Minimum time active alarms - Button: Days (down) ‣ Minimum time active alarms - Button: Hours (up) ‣ Minimum time active alarms - Touch box: Hours ‣ Minimum time active alarms - Button: Hours (down) ‣ Minimum time active alarms - Button: Minutes (up) ‣ Minimum time active alarms - Touch box: Minutes ‣ Minimum time active alarms - Button: Minutes (down) ‣ Minimum time active alarms - Button: Seconds (up) ‣ Minimum time active alarms - Touch box: Seconds ‣ Minimum time active alarms -
------------------------	---

	<p>Button: Seconds (down)</p> <ul style="list-style-type: none"> ▶ Minimum time active alarms - Button: Milliseconds (up) ▶ Minimum time active alarms - Touch box: Milliseconds ▶ Minimum time active alarms - Button: Milliseconds (down)
Origin of the data	Where does the data come from:
▶ Ring buffer	From the ring buffer.
▶ Historical data	From an archive.
▶ Labeling: Maximum number	Text for Maximum number input field
▶ Input field: Maximum number	<p>Input of the maximum alarms to be displayed when historical alarms are displayed.</p> <p>0: displays all</p>
Runtime settings	
▶ Show list without refresh	Switches the AML in stopped state. New alarms are not added.
Alarm/event groups/alarm/event classes/alarm areas	List field for grouped display:
▶ Alarm/event groups	Alarm/event groups
▶ Alarm/event classes	Alarm/event classes
▶ Alarm areas	Alarm areas

Time filter	Selection of different time filters.
Insert all elements	Opens drop-down list to select pre-defined elements for certain time periods.
Absolute period of time: classic display	Elements for the absolute time period in classic display.
Absolute period of time: compact display	Elements for the absolute time period in compact display.
Relative period of time	Elements for the relative time period.
From HH:MM:SS o' clock	Elements for a time period from a defined time.
From day - HH:MM:SS o' clock	Elements for a time period from a defined day at a defined time.
From day, month - HH:MM:SS o' clock	Elements for a time period from a defined day in a defined month at a defined time.
Time period: 15/30/60 minutes	Elements for a time period of 15, 30 or 60 minutes.
Time period: one day	Elements for a time period of one day.
Time period: 1 or 2 weeks	<p>Elements for a time period over one or two weeks.</p> <p>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.</p>
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)	<p>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:</p> <ul style="list-style-type: none"> ▶ Absolute period of time: classic display ▶ Relative period of time ▶ From HH:MM:SS o' clock ▶ From day - HH:MM:SS o' clock ▶ From day, month - HH:MM:SS o' clock

	<ul style="list-style-type: none">▶ Time period: 15/30/60 minutes▶ Time period: one day▶ Time period: 1 or 2 weeks▶ Time period: one month▶ Time period: one year
--	---

Time filter type (label)	Label for type of the time filter.
Time filter type (combobox)	Combobox: Time filter type
Time filter type (display)	Field for time filter type display.
Time filter type (radio group)	<p>Radio buttons that show or hide certain elements in Runtime:</p> <ul style="list-style-type: none"> ‣ No filter ‣ Absolute time filter ‣ Relative time filter ‣ From HH:MM:SS o' clock ‣ From day - HH:MM:SS o' clock ‣ From day, month - HH:MM:SS o' clock ‣ Time period 15 minutes ‣ Time period 30 minutes ‣ Time period 60 minutes ‣ Time period 1 day ‣ Time period 1 week ‣ Time period 2 weeks ‣ Time period 1 month ‣ Time period 1 year
Time from	<p>Fields and labels for "From"-time.</p> <ul style="list-style-type: none"> ‣ From year (label) ‣ From year (combobox) ‣ From month (label) ‣ From month (combobox) ‣ From day (label) ‣ From day (combobox) ‣ From hour (label)

	<ul style="list-style-type: none">▶ From hour (combobox)▶ From minute (label)▶ From minute (combobox)▶ From second (label)▶ From second (combobox)▶ From (spin control)
--	--

Time to	<p>Fields and labeling for stating "to" time.</p> <ul style="list-style-type: none">▶ 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)	<p>Fields and labeling for stating "from" time, optimized for touch operation.</p> <ul style="list-style-type: none">▶ From year (label)▶ From year (combobox)▶ From month (label)▶ From month (combobox)▶ From day (label)▶ From day (combobox)▶ From hour (label)▶ From hour (combobox)▶ From minute (label)▶ From minute (combobox)▶ From second (label)

	<ul style="list-style-type: none">▶ From second (combobox)▶ From (spin control)
--	--

Time to (Touch)	<p>Fields and labeling for stating "to" time, optimized for touch operation.</p> <ul style="list-style-type: none"> ‣ To year (label) ‣ To year (combobox) ‣ To month (label) ‣ To month (combobox) ‣ To day (label) ‣ To day (combobox) ‣ To hour (label) ‣ To hour (combobox) ‣ To minute (label) ‣ To minute (combobox) ‣ To second (label) ‣ To second (combobox) ‣ To (spin control)
Absolute time filter	<p>Fields and labels for absolute time filter.</p> <ul style="list-style-type: none"> ‣ 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	<p>Fields and labeling for stating time periods.</p> <ul style="list-style-type: none"> ‣ From year (label) ‣ From year (combobox)



	<ul style="list-style-type: none">▶ From month (label)▶ From month (combobox)▶ Week (label)▶ Week (combobox)▶ From day (label)▶ From day (combobox)▶ Start time (label)▶ Start time (combobox)
--	---

Time period (Touch)	<p>Fields and labeling for stating "from" time, optimized for touch operation.</p> <ul style="list-style-type: none"> ‣ From year (label) ‣ From year (up) ‣ From year (touchbox) ‣ From year (down) ‣ From month (label) ‣ From month (up) ‣ From month (touchbox) ‣ From month (down) ‣ Week (label) ‣ Week (up) ‣ Week (touchbox) ‣ Week (down) ‣ From day (label) ‣ From day (up) ‣ From day (touchbox) ‣ Button: From day (down) ‣ Start time (label) ‣ Start time (up) ‣ Start time (touchbox) ‣ Start time button (down)
Text filter	Drop-down list of different text filters (on page 400).
Insert all elements: Text filter	Inserts all elements for text filters.
No text filter	Radio button to deselect text filter.
Search for (words separated by spaces)	Radio button to activate the search

Labeling: Search text	Labeling for search field.
Input field: Search text	Field for input of search term.
Options	Search options
‣ Note capitalization	Capitalization must be noted.
‣ Words do not have to appear in the text in full	Fragments can also be searched for.
‣ At least one word must be present in the text	At least one search term from several must be in the result.
‣ All words must be present in the text	All search terms must be included in the result.
‣ Filter text must appear in the text exactly	Exact text from the input field must be contained in the result.
OK	Accept inputs and close screen.
Cancel	Reject inputs and close screen.
Accept	Accept inputs and leave screen open for further inputs.
Refresh	Refresh screen.

FILTER SCREENS

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



Attention

*In order for the time to be taken from the screen to be called up in Runtime, the following time range must be selected in the Editor for the screen switching function for the Alarm Message List or the Chronological Event List in the **time filter**: Set filter at time filter type*

CALL DEFINITION

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

1. Set filter for time filter type is selected as a time period for the time filter.
2. The screen (**Alarm Message List Filter, Chronological Event List filter Or Time Filter screens**) are activated using a button or a combined element. Only in this way can the relationship between filter screen and source screen be maintained.

3. The source screen and filter screen must be configured on different frames or monitors. The filter for the filter screen can only be updated if the source screen is open. This is only possible if both screens do not use the same frame or the same monitor.
4. The screen to be called up must be compatible with the filter screen to be called up (see table).

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

Key:

- ▶ C: Common settings are updated.
- ▶ T: Time settings are updated.
- ▶ X: All settings are updated.



Information

No filtering

The filter screen is not filtered, but opened with the configured values, if:

- ▶ One of the conditions 1 to 3 is not met or
- ▶ The Screen to call up setting is not activated for the **Screen switching** function or
- ▶ The screen is not called up via a screen element

*In this case, the **Accept**, **Close** and **Update** buttons are grayed out in Runtime and have no function.*

Create a screen of the type CEL Filter

It is possible to adjust filter settings for the Chronological Event List in 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 available in the filter for the function to switch the screen to the Chronological Event List screen 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 chapter.

For the definition of filter criteria, see Filter screen switch CEL Filter chapter.



Attention

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

CREATE A SCREEN OF TYPE CHRONOLOGICAL EVENT LIST FILTER

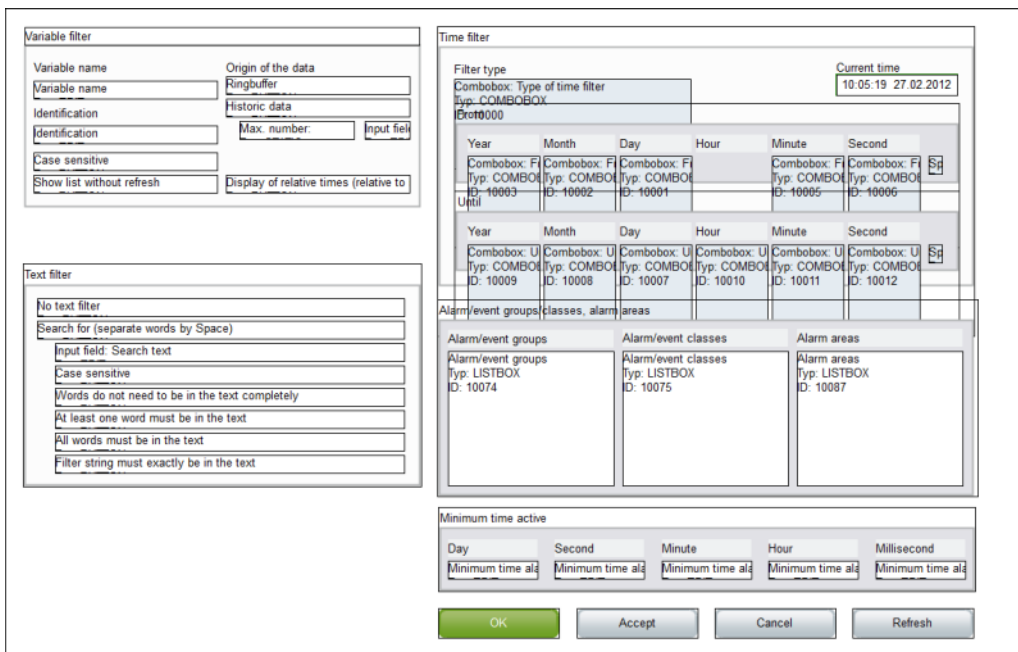
To create a screen of type `Chronological Event List Filter`:

1. Select, in the toolbar or in the context menu of the **Screens** node, the **New Screen** command
2. An standard empty screen is opened
3. Change the screen type in the detail view; to do this:
 - a) click on **standard** in the **Screen type** column
 - b) select **Chronological Event List Filter** from the drop-down list
4. select an own frame
(CEL filter must not be based on the same frame as another screen)
5. click in the screen

6. Select the **control elements** menu item in the menu bar
7. Click on **Add template** (on page 331) in the drop-down list
8. The dialog for selecting a template is opened
9. select the desired template
10. Select additional elements as required and insert them into the desired place on the screen
11. Name the screen according to the selected filter

To do this:

 - a) Click on the screen name in the detail view in the **name** column
 - b) Select a suitable pre-defined name (on page 391) from the drop-down list it give it a name of your own
12. Create a screen switch function in order to be able to call up the screen in Runtime



Variable filter

Variable name: Origin of the data:

Identification: Max. number: Input field:

Case sensitive: ☐ Show list without refresh: ☐ Display of relative times (relative to):

Text filter

No text filter: ☐

Search for (separate words by Space):

Input field: Search text:

Case sensitive: ☐

Words do not need to be in the text completely: ☐

At least one word must be in the text: ☐

All words must be in the text: ☐

Filter string must exactly be in the text: ☐

Time filter

Filter type: Current time: 10.05.19 27.02.2012

Combobox: Type of time filter:

Year: Month: Day: Hour: Minute: Second:

Combobox: Combobox: Combobox: Combobox: Combobox:

Year: Month: Day: Hour: Minute: Second:

Combobox: Combobox: Combobox: Combobox: Combobox:

Year: Month: Day: Hour: Minute: Second:

Combobox: Combobox: Combobox: Combobox: Combobox:

Alarm/event groups: Alarm/event classes: Alarm areas:

Alarm/event groups: Alarm/event classes: Alarm areas:

Alarm/event groups: Alarm/event classes: Alarm areas:

Minimum time active

Day: Second: Minute: Hour: Millisecond:

Minimum time active: Minimum time active: Minimum time active: Minimum time active: Minimum time active:

OK Accept Cancel Refresh

ELEMENTS

The screen of type **Chronological Event List Filter** can contain the following control and display elements.

Element	Description
Insert template	<p>Opens the dialog for selecting a template (on page 331) for the screen type.</p> <p>Templates are shipped together with zenon and can also be created by the user.</p> <p>Templates add pre-defined control elements to pre-defined locations in the screen. Elements that are not necessary can also be removed individually once they have been created. Additional elements are selected from the drop-down list and placed in the screen. Elements can be moved in the screen and placed individually.</p>
General filter	Drop-down list of different general filters.
Insert all elements: General filter	Inserts all elements from the area of general filters into pre-defined places. Elements can be arranged individually.
Variable filter	Alarms of which variables are displayed:
▶ Variable name	Filter according to names of variables.
▶ Identification	Filter according to identification of variables.
▶ Note capitalization	Note capitalization when filtering the variables.
Origin of the data	Where does the data come from:
▶ Ring buffer	From the ring buffer.
▶ Historical data	From an archive.
▶ Labeling: Maximum number	Text for Maximum number input field
▶ Input field: Maximum number	<p>Input of the maximum alarms to be displayed when historical alarms are displayed.</p> <p>0: displays all</p>
Runtime settings	
▶ Show list without refresh	Displays the AML without refresh. New alarms are not added.
▶ Show relative times	Switches between the normal display and the relative-time display without the entries losing focus.

	<p>Relative time: All entries are displayed in temporally distance to the selected entry.</p> <p>The stated time is the time difference which has passed since the selected event. The selected entry automatically receives time stamp 0. The other events have a:</p> <ul style="list-style-type: none"> ▶ 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/alarm/event classes/alarm areas	List field for grouped display:
▶ Alarm/event groups	Alarm/event groups
▶ Alarm/event classes	Alarm/event classes
▶ Alarm areas	Alarm areas

Time filter	Drop-down list of different time filters.
Insert all elements	Opens drop-down list to select pre-defined elements for certain time periods.
Absolute period of time: classic display	Elements for the absolute time period in classic display.
Absolute period of time: compact display	Elements for the absolute time period in compact display.
Relative period of time	Elements for the relative time period.
From HH:MM:SS o' clock	Elements for a time period from a defined time.
From day - HH:MM:SS o' clock	Elements for a time period from a defined day at a defined time.
From day, month - HH:MM:SS o' clock	Elements for a time period from a defined day in a defined month at a defined time.
Time period: 15/30/60 minutes	Elements for a time period of 15, 30 or 60 minutes.
Time period: one day	Elements for a time period of one day.
Time period: 1 or 2 weeks	<p>Elements for a time period over one or two weeks.</p> <p>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.</p>
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)	<p>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:</p> <ul style="list-style-type: none"> ▶ Absolute period of time: classic display ▶ Relative period of time ▶ From HH:MM:SS o' clock ▶ From day - HH:MM:SS o' clock ▶ From day, month - HH:MM:SS o' clock

	<ul style="list-style-type: none">▶ Time period: 15/30/60 minutes▶ Time period: one day▶ Time period: 1 or 2 weeks▶ Time period: one month▶ Time period: one year
--	---

Time filter type (label)	Label for type of the time filter.
Time filter type (combobox)	Combobox: Time filter type
Time filter type (display)	Field for time filter type display.
Time filter type (radio group)	<p>Radio buttons that show or hide certain elements in Runtime:</p> <ul style="list-style-type: none"> ‣ No filter ‣ Absolute time filter ‣ Relative time filter ‣ From HH:MM:SS o' clock ‣ From day - HH:MM:SS o' clock ‣ From day, month - HH:MM:SS o' clock ‣ Time period 15 minutes ‣ Time period 30 minutes ‣ Time period 60 minutes ‣ Time period 1 day ‣ Time period 1 week ‣ Time period 2 weeks ‣ Time period 1 month ‣ Time period 1 year
Time from	<p>Fields and labels for "From"-time.</p> <ul style="list-style-type: none"> ‣ From year (label) ‣ From year (combobox) ‣ From month (label) ‣ From month (combobox) ‣ From day (label) ‣ From day (combobox) ‣ From hour (label)

	<ul style="list-style-type: none">▶ From hour (combobox)▶ From minute (label)▶ From minute (combobox)▶ From second (label)▶ From second (combobox)▶ From (spin control)
--	--

Time to	<p>Fields and labeling for stating "to" time.</p> <ul style="list-style-type: none">▶ 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)	<p>Fields and labeling for stating "from" time, optimized for touch operation.</p> <ul style="list-style-type: none">▶ From year (label)▶ From year (combobox)▶ From month (label)▶ From month (combobox)▶ From day (label)▶ From day (combobox)▶ From hour (label)▶ From hour (combobox)▶ From minute (label)▶ From minute (combobox)▶ From second (label)

	<ul style="list-style-type: none">▶ From second (combobox)▶ From (spin control)
--	--

Time to (Touch)	<p>Fields and labeling for stating "to" time, optimized for touch operation.</p> <ul style="list-style-type: none"> ‣ To year (label) ‣ To year (combobox) ‣ To month (label) ‣ To month (combobox) ‣ To day (label) ‣ To day (combobox) ‣ To hour (label) ‣ To hour (combobox) ‣ To minute (label) ‣ To minute (combobox) ‣ To second (label) ‣ To second (combobox) ‣ To (spin control)
Absolute time filter	<p>Fields and labels for absolute time filter.</p> <ul style="list-style-type: none"> ‣ 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	<p>Fields and labeling for stating time periods.</p> <ul style="list-style-type: none"> ‣ From year (label) ‣ From year (combobox)



	<ul style="list-style-type: none">▶ From month (label)▶ From month (combobox)▶ Week (label)▶ Week (combobox)▶ From day (label)▶ From day (combobox)▶ Start time (label)▶ Start time (combobox)
--	---

Time period (Touch)	<p>Fields and labeling for stating "from" time, optimized for touch operation.</p> <ul style="list-style-type: none"> ‣ From year (label) ‣ From year (up) ‣ From year (touchbox) ‣ From year (down) ‣ From month (label) ‣ From month (up) ‣ From month (touchbox) ‣ From month (down) ‣ Week (label) ‣ Week (up) ‣ Week (touchbox) ‣ Week (down) ‣ From day (label) ‣ From day (up) ‣ From day (touchbox) ‣ Button: From day (down) ‣ Start time (label) ‣ Start time (up) ‣ Start time (touchbox) ‣ Start time button (down)
Text filter	Drop-down list of different text filters (on page 400).
Insert all elements: Text filter	Inserts all elements for text filters.
No text filter	Radio button to deselect text filter.
Search for (words separated by spaces)	Radio button to activate the search

Labeling: Search text	Labeling for search field.
Input field: Search text	Field for input of search term.
Options	Search options
‣ Note capitalization	Capitalization must be noted.
‣ Words do not have to appear in the text in full	Fragments can also be searched for.
‣ At least one word must be present in the text	At least one search term from several must be in the result.
‣ All words must be present in the text	All search terms must be included in the result.
‣ Filter text must appear in the text exactly	Exact text from the input field must be contained in the result.
OK	Accept inputs and close screen.
Cancel	Reject inputs and close screen.
Accept	Accept inputs and leave screen open for further inputs.
Refresh	Refresh screen.

FILTER SCREENS

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



Attention

*In order for the time to be taken from the screen to be called up in Runtime, the following time range must be selected in the Editor for the screen switching function for the Alarm Message List or the Chronological Event List in the **time filter**: Set filter at time filter type*

CALL DEFINITION

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

1. Set filter for time filter type is selected as a time period for the time filter.
2. The screen (**Alarm Message List Filter**, **Chronological Event List filter** Or **Time Filter screens**) are activated using a button or a combined element. Only in this way can the relationship between filter screen and source screen be maintained.
3. The source screen and filter screen must be configured on different frames or monitors. The filter for the filter screen can only be updated if the source screen is open. This is only possible if both screens do not use the same frame or the same monitor.
4. The screen to be called up must be compatible with the filter screen to be called up (see table).

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

Key:

- ▶ C: Common settings are updated.
- ▶ T: Time settings are updated.
- ▶ X: All settings are updated.



Information

No filtering

The filter screen is not filtered, but opened with the configured values, if:

- ▶ One of the conditions 1 to 3 is not met or
- ▶ The `Screen to call up` setting is not activated for the **Screen switching** function or
- ▶ The screen is not called up via a screen element

*In this case, the **Accept**, **Close** and **Update** buttons are grayed out in Runtime and have no function.*

Create screen of type Time filter

It is possible to make changes to the time filter settings in Runtime using a `time filter` screen. The following screens can be influenced by the filter:

- ▶ Alarm Message List
- ▶ Archive revision
- ▶ Chronological Event List
- ▶ Extended Trend

The advantage of this type of screen is that only the filter elements that are actually necessary can be configured. Therefore the user does not need to get to grips with numerous filter settings. Only the filter settings that he needs are displayed. Furthermore, you are completely free to change the appearance and can, for example, ensure ease of use by means of a touch screen.



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 time filter screen, all time filter settings that are also present in the filter for the function to switch screens to the appropriate screen can be engineered.

CREATE SCREEN OF TYPE TIME FILTER

Absolute time filter

Current time
09:51:43 16.01.2013

From

Year	Month	Day	Hour	Minute	Second	Sp
Col	Fi	Fi	Fi	Fi	Fi	Fi
Type: COMBO	Type: COMBO	Type: COMBO	Type: COMBO	Type: COMBO	Type: COMBO	Type: COMBO
ID: 10003	ID: 10002	ID: 10001	ID: 10004	ID: 10005	ID: 10006	

Until

Year	Month	Day	Hour	Minute	Second	Sp
Combobox: U	Combobox: U	Combobox: U	Combobox: U	Combobox: U	Combobox: U	Combobox: U
Type: COMBO	Type: COMBO	Type: COMBO	Type: COMBO	Type: COMBO	Type: COMBO	Type: COMBO
ID: 10009	ID: 10008	ID: 10007	ID: 10010	ID: 10011	ID: 10012	

OK Accept Cancel Refresh

In order to create a Time filter screen:

1. Select, in the toolbar or in the context menu of the **Screens** node, the **New Screen** command
2. An standard empty screen is opened
3. Change the screen type in the detail view; to do this:
 - a) click on **standard** in the **screen type** column
 - b) Select **Time filter** from the drop down list
4. Select your own frame
(time filter cannot be based on the same frame as other screens)
5. Click in the screen.
6. Select the **Control elements** menu item in the menu bar
7. Click on **Add template** (on page 331) in the drop-down list
8. The dialog for selecting a template is opened
9. select the desired template (on page 389)
10. Standard elements are placed in pre-defined positions; these can be deleted or positioned elsewhere
11. You can add further elements using the **Control elements** (on page 379) menu
12. Name the screen according to the selected filter
To do this:

- a) Click on the screen name in the detail view in the **name** column
- b) Select a suitable pre-defined name (on page 391) from the drop-down list it give it a name of your own

13. Create a screen switch function in order to be able to call up the screen in Runtime

Control elements

For time filter screens, there are also elements that have been optimized for touch-screen operation in addition to the conventional elements.

Type of time filter

Combobox: Type of time filter
Typ: COMBOBOX
ID: 10000

Current time
09:55:44 16.01.2013

Year	Month	Day	Hour	Minute	Second	Sp
Combobox: F1	Combobox: F1	Combobox: F1	Combobox: F1	Combobox: F1	Combobox: F1	Combobox: F1
Typ: COMBO	Typ: COMBO	Typ: COMBO	Typ: COMBO	Typ: COMBO	Typ: COMBO	Typ: COMBO
ID: 10003	ID: 10002	ID: 10001	ID: 10004	ID: 10005	ID: 10006	

Until

Year	Month	Day	Hour	Minute	Second	Sp
Combobox: U	Combobox: U	Combobox: U	Combobox: U	Combobox: U	Combobox: U	Combobox: U
Typ: COMBO	Typ: COMBO	Typ: COMBO	Typ: COMBO	Typ: COMBO	Typ: COMBO	Typ: COMBO
ID: 10009	ID: 10008	ID: 10007	ID: 10010	ID: 10011	ID: 10012	

OK Accept Cancel Refresh

Control element	Description
Insert template	<p>Opens the dialog for selecting a template (on page 331) for the screen type.</p> <p>Templates are shipped together with zenon and can also be created by the user.</p> <p>Templates add pre-defined control elements to pre-defined locations in the screen. Elements that are not necessary can also be removed individually once they have been created. Additional elements are selected from the drop-down list and placed in the screen. Elements can be moved in the screen and placed individually.</p>
Insert all elements	Opens drop-down list to select pre-defined elements for certain time periods.
Absolute period of time: classic display	Elements for the absolute time period in classic display.
Absolute period of time: compact display	Elements for the absolute time period in compact display.
Relative period of time	Elements for the relative time period.
From HH:MM:SS o' clock	Elements for a time period from a defined time.
From day - HH:MM:SS o' clock	Elements for a time period from a defined day at a defined time.
From day, month - HH:MM:SS o' clock	Elements for a time period from a defined day in a defined month at a defined time.
Time period: 15/30/60 minutes	Elements for a time period of 15, 30 or 60 minutes.
Time period: one day	Elements for a time period of one day.
Time period: 1 or 2 weeks	<p>Elements for a time period over one or two weeks.</p> <p>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.</p>
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

	<p>touch operation. Like Insert all elements, the following are available:</p> <ul style="list-style-type: none"> ‣ Absolute period of time: classic display ‣ Relative period of time ‣ From HH:MM:SS o' clock ‣ From day - HH:MM:SS o' clock ‣ From day, month - HH:MM:SS o' clock ‣ Time period: 15/30/60 minutes ‣ Time period: one day ‣ Time period: 1 or 2 weeks ‣ Time period: one month ‣ Time period: one year
Time filter type (label)	Label for type of the time filter.
Time filter type (combobox)	Combobox: Time filter type
Time filter type (display)	Field for time filter type display.
Time filter type (radio group)	<p>Radio buttons that show or hide certain elements in Runtime:</p> <ul style="list-style-type: none"> ‣ No filter ‣ Absolute time filter ‣ Relative time filter ‣ From HH:MM:SS o' clock ‣ From day - HH:MM:SS o' clock ‣ From day, month - HH:MM:SS o' clock ‣ Time period 15 minutes ‣ Time period 30 minutes ‣ Time period 60 minutes ‣ Time period 1 day ‣ Time period 1 week

	<ul style="list-style-type: none">▶ Time period 2 weeks▶ Time period 1 month▶ Time period 1 year
--	--

Time from	<p>Fields and labels for "From"-time.</p> <ul style="list-style-type: none"> ‣ From year (label) ‣ From year (combobox) ‣ From month (label) ‣ From month (combobox) ‣ From day (label) ‣ From day (combobox) ‣ From hour (label) ‣ From hour (combobox) ‣ From minute (label) ‣ From minute (combobox) ‣ From second (label) ‣ From second (combobox) ‣ From (spin control)
Time to	<p>Fields and labeling for stating "to" time.</p> <ul style="list-style-type: none"> ‣ 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)



	<p>► To (spin control)</p>
--	----------------------------

Time from (Touch)	<p>Fields and labeling for stating "from" time, optimized for touch operation.</p> <ul style="list-style-type: none">▶ From year (label)▶ From year (combobox)▶ From month (label)▶ From month (combobox)▶ From day (label)▶ From day (combobox)▶ From hour (label)▶ From hour (combobox)▶ From minute (label)▶ From minute (combobox)▶ From second (label)▶ From second (combobox)▶ From (spin control)
Time to (Touch)	<p>Fields and labeling for stating "to" time, optimized for touch operation.</p> <ul style="list-style-type: none">▶ 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)

	<ul style="list-style-type: none">▶ To second (label)▶ To second (combobox)▶ To (spin control)
--	--

Absolute time filter	<p>Fields and labels for absolute time filter.</p> <ul style="list-style-type: none"> ‣ 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	<p>Fields and labeling for stating time periods.</p> <ul style="list-style-type: none"> ‣ From year (label) ‣ From year (combobox) ‣ From month (label) ‣ From month (combobox) ‣ Week (label) ‣ Week (combobox) ‣ From day (label) ‣ From day (combobox) ‣ Start time (label) ‣ Start time (combobox)
Time period (Touch)	<p>Fields and labeling for stating "from" time, optimized for touch operation.</p> <ul style="list-style-type: none"> ‣ From year (label) ‣ From year (up) ‣ From year (touchbox) ‣ From year (down) ‣ From month (label)

	<ul style="list-style-type: none"> ▶ From month (up) ▶ From month (touchbox) ▶ From month (down) ▶ Week (label) ▶ Week (up) ▶ Week (touchbox) ▶ Week (down) ▶ From day (label) ▶ From day (up) ▶ From day (touchbox) ▶ Button: From day (down) ▶ Start time (label) ▶ Start time (up) ▶ Start time (touchbox) ▶ Start time button (down)
Cancel	Button to cancel the filter settings in Runtime.
Accept	Button to accept the filter settings in Runtime.
Refresh	Button to refresh the filtered display.

EMPHASIS OF TOUCH ELEMENTS

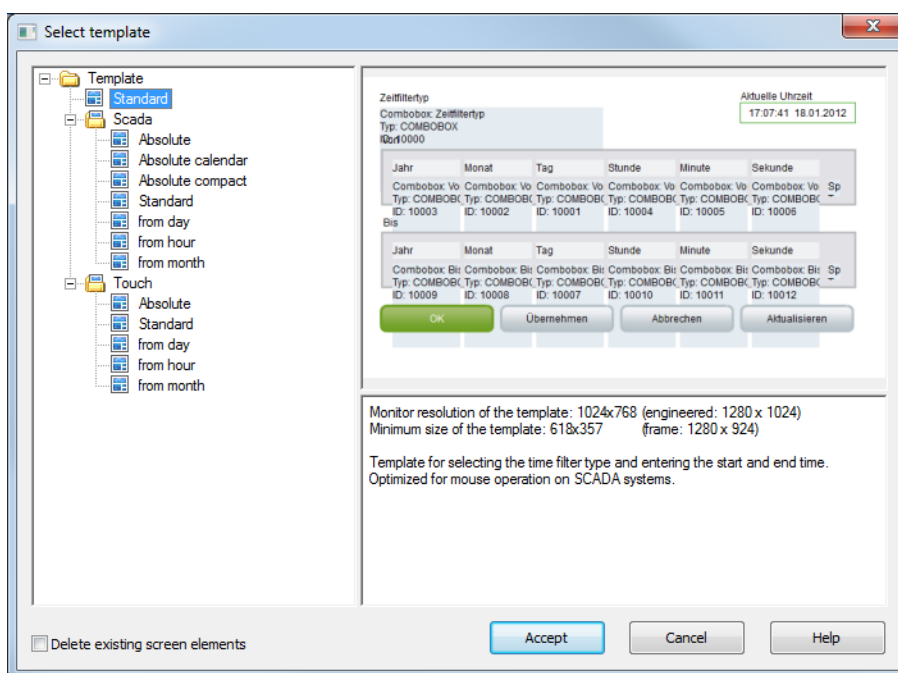
Control elements for touch operation can be emphasized by means of colored emphasis. To do this, the following properties in the `Color` group are configured in the screen for touch elements:

- ▶ `Text color for selection with focus`: Text color if the element is in focus
- ▶ `Background color for selection with focus`: Background color if the element is in focus
- ▶ `Text color for selection without focus`: Text color if the element is not in focus

- Background color for selection without focus: Background color if the element is not in focus

Template

Pre-defined templates are available for time filter screens.



Parameters	Description
List field templates (left)	Displays all pre-defined and user-defined template.
Standard	Inserts standard elements.
Scada	Template for mouse operation
Absolute	Inserts elements for absolute time.
Absolute calendar	Inserts elements for absolute time with calendar.
Absolute compact	Inserts elements for absolute time in compressed design.
Standard	Inserts standard elements.
from month	Inserts elements for time range from month.
from hour	Inserts elements for time range from hour.
from day	Inserts elements for time range from day.
Touch	Templates, optimized for touch operation.
Absolute	Inserts elements for absolute time.
Standard	Inserts standard elements.
from month	Inserts elements for time range from month.
from hour	Inserts elements for time range from hour.
from day	Inserts elements for time range from day.
Preview to template (top right)	Preview of the screen at taking over the selected template.
Description template (bottom right)	Description of the template.
Delete existing screen elements	Active: Already existing elements in the screen are deleted when taking over the template.
Apply	Inserts the elements of the selected template in the screen and closes the dialog.
Cancel	Closes dialog without inserting elements.
Help	Opens online help.

Pre-defined names

Pre-defined names are available for time filters. 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.
 - 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

Note: CEL filter and AML filter screens also have a pre-defined name, CEL_FILTER and AML_FILTER.

Using screen of type Time filter

FILTER SCREENS

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



Attention

*In order for the time to be taken from the screen to be called up in Runtime, the following time range must be selected in the Editor for the screen switching function for the Alarm Message List or the Chronological Event List in the **time filter**: Set filter at time filter type*

CALL DEFINITION

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

1. Set filter for time filter type is selected as a time period for the time filter.
2. The screen (**Alarm Message List Filter**, **Chronological Event List filter** OR **Time Filter screens**) are activated using a button or a combined element. Only in this way can the relationship between filter screen and source screen be maintained.
3. The source screen and filter screen must be configured on different frames or monitors. The filter for the filter screen can only be updated if the source screen is open. This is only possible if both screens do not use the same frame or the same monitor.
4. The screen to be called up must be compatible with the filter screen to be called up (see table).

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

Key:

- ▶ C: Common settings are updated.
- ▶ T: Time settings are updated.

- ▶ X: All settings are updated.



Information

No filtering

The filter screen is not filtered, but opened with the configured values, if:

- ▶ One of the conditions 1 to 3 is not met or
- ▶ The `Screen to call up` setting is not activated for the **Screen switching** function or
- ▶ The screen is not called up via a screen element

*In this case, the **Accept**, **Close** and **Update** buttons are grayed out in Runtime and have no function.*

UPDATE

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

- ▶ If the filter screen is called up via a screen element, the target screens on the same monitor as the source screen are updated.
- ▶ If the filter is called up in a different way or if the `Update on all monitors` setting is activated, all target screens configured are updated.

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

UPDATE FILTER SETTINGS

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

17.5.2 Screen switch to a filter screen

To create a function to switch to a filter screen:

1. select **New Function**
2. select **Screen switching**
3. Select the desired screen
 - AML filter
 - CEL filter
 - Time filter
4. The dialog to configure and link the filter for the selected screen type is opened
5. Configure the corresponding tabs



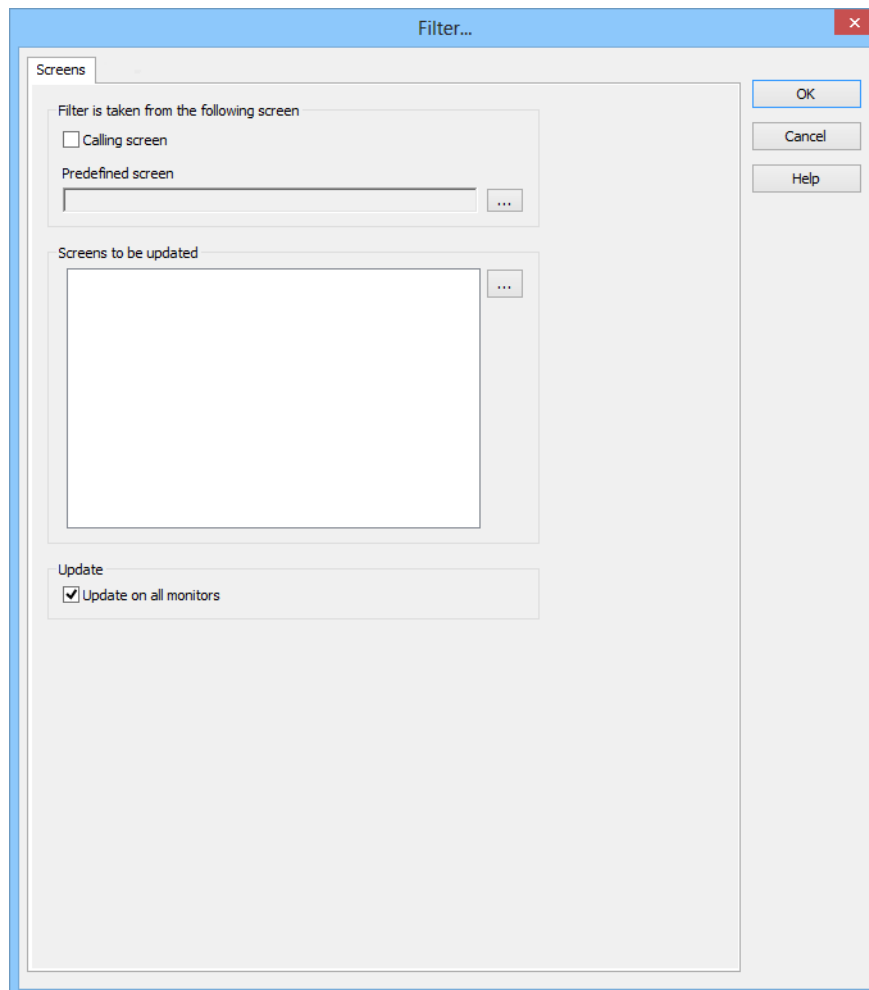
Information

Not all tabs are available for all screen filter types:

- ▶ AML filter: Screens, General, Text, Time
- ▶ CEL filter: Screens, General, Text, Time
- ▶ Time filter: Screens, Time

Screens

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



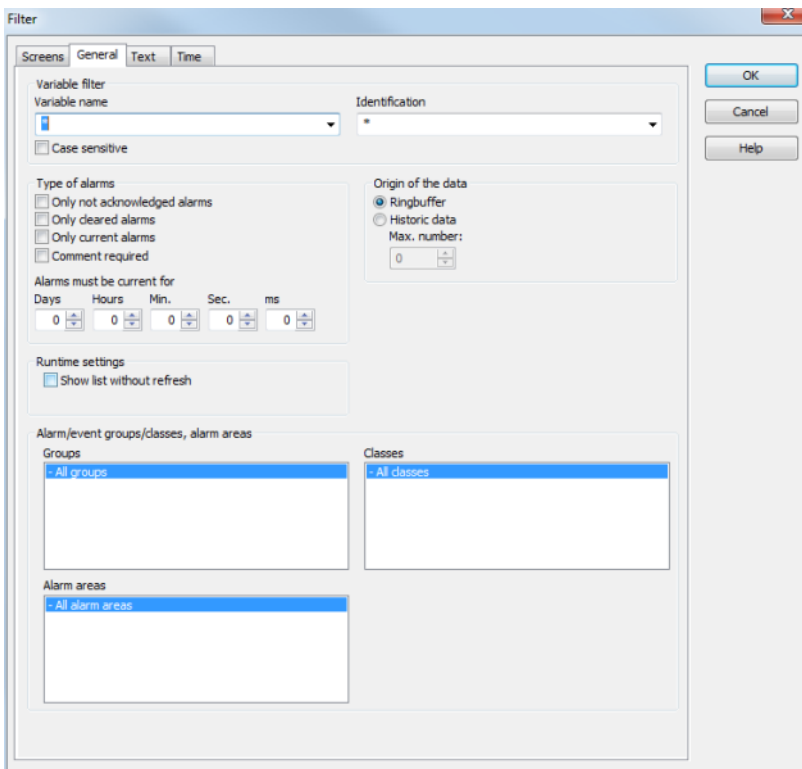
The following settings are available:

Parameters	Description
Filter is taken from the following screen	Definition of the screen form which the filter is to be taken.
Calling screen	<p>Active: The filter settings are take over from the screen from which the filter screen is called up. The screen button is grayed out. You cannot explicitly select a screen, because the filter is always updated from the calling screen with this setting.</p> <p>Note: Settings in the General, Text and Time tabs are locked.</p>
Predefined screen	<p>Click on button opens the Screen selection dialog.</p> <p>Select the screen from which the filter - when clicking button Update during Runtime - should be read.</p> <p>Subscreens of faceplates (on page 416) can be selected for screen switching to AML filter, CEL filter, time filter and equipment model. For these screens, the name of the faceplate screen is placed in front of the subscreen in order to clearly distinguish them from other screens.</p> <p>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!</p> <p>Note: It therefore only makes sense to select a screen which can adopt or fill the screen filter.</p> <p>The screen selected is entered into the list of screens to be updated. If you delete it from the list, the next screen on the list is automatically entered here.</p> <p>Note: Not available if you have activated the Calling screen checkbox.</p>
Screens to be updated	<p>Selection of the screens that are to be updated.</p> <p>Subscreens of faceplates (on page 416) can be selected for screen switching to AML filter, CEL filter, time filter and equipment model. For these screens, the name of the faceplate screen is placed in front of the subscreen in order to clearly distinguish them from other screens.</p>
Screen selection	Click the button to open dialog Screen selection of the filter screens. Select the desired screen.
Update	Stipulation of where the filter should take effect.
Update on all monitors	Active: The screens from the list of the screens which must be updated are updated on all accessible monitors.

General

This tab is only available for the Alarm Message List and Chronologic Event List and shows the standard filter for the respective list. See Alarm Message List filter and Chronological Event List filter.

AML



The screenshot shows the 'Filter' dialog box with the 'General' tab selected. The dialog has four tabs: 'Screens', 'General', 'Text', and 'Time'. The 'General' tab contains the following sections:

- Variable filter:** Includes a 'Variable name' dropdown menu, an 'Identification' dropdown menu, and a 'Case sensitive' checkbox.
- Type of alarms:** Includes checkboxes for 'Only not acknowledged alarms', 'Only cleared alarms', 'Only current alarms', and 'Comment required'.
- Alarms must be current for:** Includes input fields for 'Days', 'Hours', 'Min.', 'Sec.', and 'ms', each with a spin button.
- Runtime settings:** Includes a checkbox for 'Show list without refresh'.
- Alarm/event groups/classes, alarm areas:** Includes three list boxes: 'Groups' (with '- All groups' selected), 'Classes' (with '- All classes' selected), and 'Alarm areas' (with '- All alarm areas' selected).

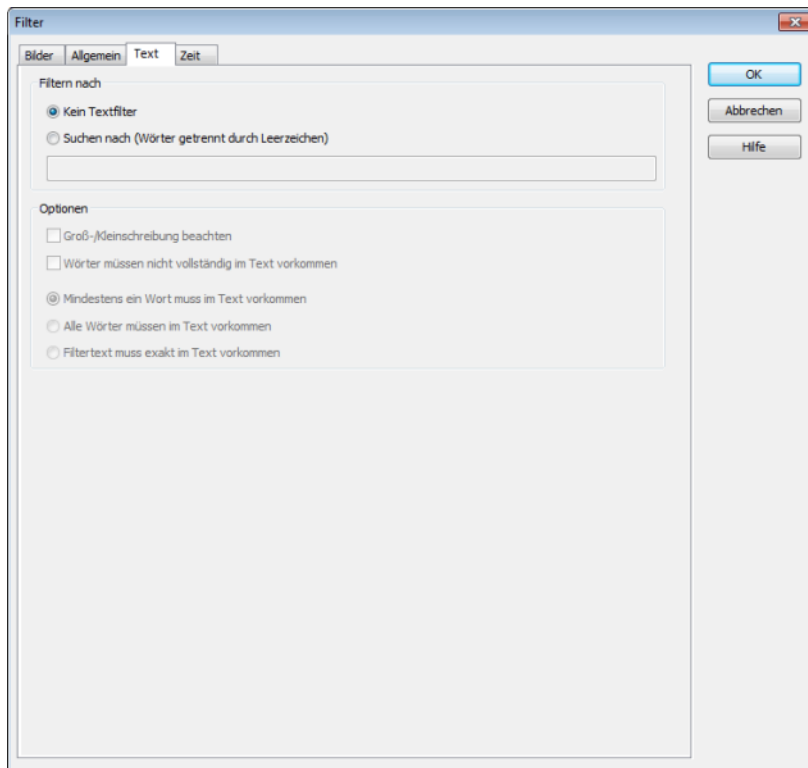
On the right side of the dialog, there are three buttons: 'OK', 'Cancel', and 'Help'.

Parameters	Description
Variable filter	Limitation to alarms of certain variables
Variable name	<p>Enter the name or part of the name of the variable you want to filter. Wild card * is possible.</p> <p>Note: Wild cards are only allowed as prefix or suffix, i.e. *xxx or xxx*</p>
Identification	<p>Enter the identification or part of the identification of the variables you want to filter. Wild card * is possible.</p> <p>Note: Wild cards are only allowed as prefix or suffix, i.e. *xxx or xxx*</p>
Note capitalization	Active: Capitalization is recognized when filtering for variable name and/or identification.
Type of alarms	Type of alarm that is displayed.
Only not acknowledged alarms	Active: Only alarms that have not yet been acknowledged by the user are displayed.
Only cleared alarms	Active: Only alarms that have already passed, i.e. whose values no longer in the critical range, are displayed.
Only current alarms	Active: Only alarms that are still active, i.e. whose values are still in the critical range, are displayed.
Alarms must be current for	<p>Use the spin control to define the minimum time that an alarm should be active in order for it to be displayed.</p> <p>Possible settings:</p> <ul style="list-style-type: none"> ▸ Days ▸ Hours (hr.) ▸ Minutes (min.) ▸ Seconds (sec.) ▸ Milliseconds (ms)
Origin of the data	Display of current or current and historical alarms.
Ring buffer	Active: Only data from the ring buffer are displayed.
Historical data Maximum number	Active: Data from the ring buffer and historical data from the AML are displayed.

	The maximum number of the data which should be displayed includes the data from the ring buffer.
Runtime settings	Behavior of the AML in Runtime
Show list without refresh	Active: As long as the list is displayed no new entries are added.
Alarm/event groups/classes and alarm areas	Selection of groups, classes and alarm area.
Alarm/event groups	From the existing alarm/event groups 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.

Text

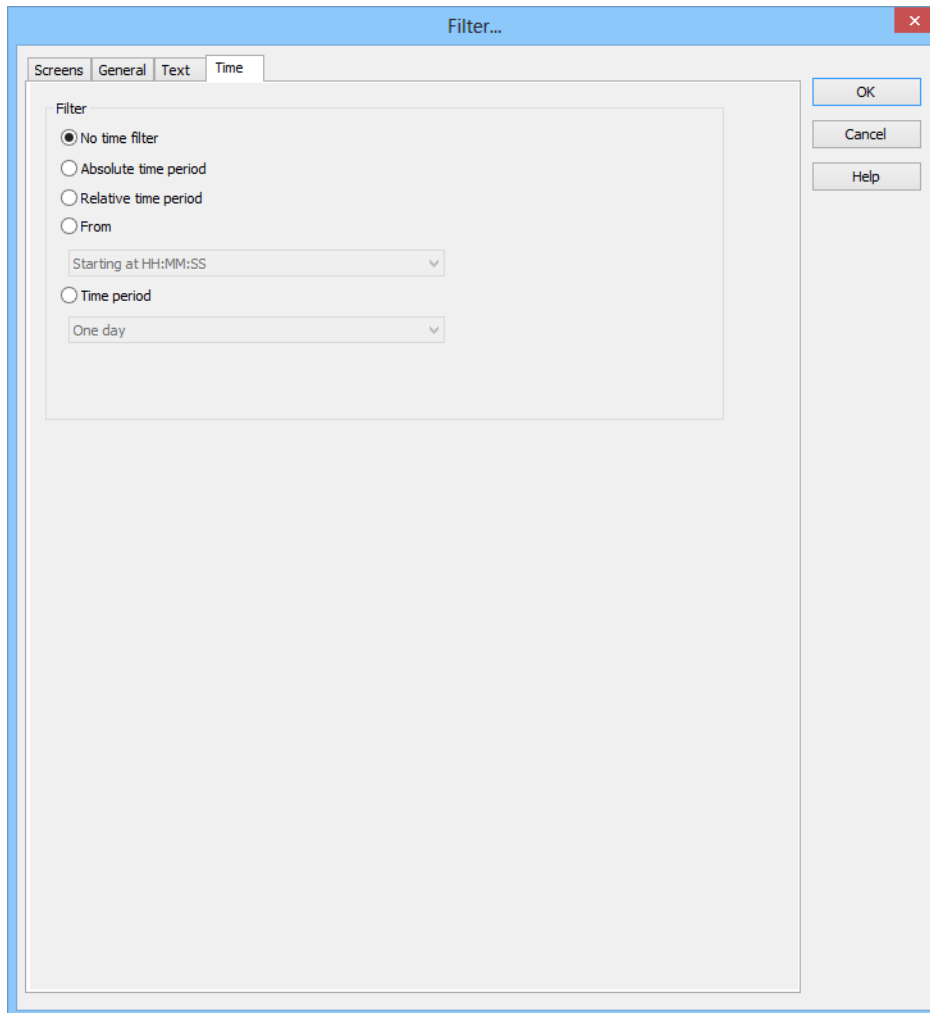
You can define the standard values for text filtering in this tab. Only available for Alarm Message List and Chronological Event List.



Parameters	Description
Filter by	
No text filter	The text filter is not used.
Search for (words separated by spaces)	The text filter filter is used. Further options are activated.
Input field	Enter the corresponding words or character strings.
Options	
Note capitalization	Active: The filtering is case-sensitive.
Words do not have to appear in the text in full	Active: Parts of words can also be taken into account during filtering.
At least one word must be present in the text	Active: At least one word of the search string has to be in the text.
All words must be present in the text	Active: All words must be present in the search string. In doing so, the sequence plays no role.
Filter text must be in the text exactly	Active: The text must be exactly as defined in the search string.

Time

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



Filter...

Screens General Text Time

Filter

☒ No time filter

☐ Absolute time period

☐ Relative time period

☐ From

Starting at HH:MM:SS

☐ Time period

One day

OK

Cancel

Help

Parameters	Description
Filter	Selection of the filter.
No time filter	Active: No time filter is used. Not available for Extended Trend
Absolute filter	Active: A fixed period of time is entered in the editor. When the function is executed, the defined absolute time period is exactly used. In the settings section, the corresponding options can be shown and configured there. Note: Time is saved in UTC. For details see chapter Handling of date and time in chapter Runtime.
Relative period of time	Active: A relative time period is entered. In the settings section, the corresponding options can be shown and configured there. Attention: this filter is constantly updated.
From	Active: A time from which the filter is effective is stated. If the time is not reached on the current day, filtering takes place from the corresponding time the previous day. Selection of the area mode from drop-down list: <ul style="list-style-type: none"> ▶ From HH:MM:SS o' clock ▶ From day - HH:MM:SS o' clock ▶ From day, month - HH:MM:SS o' clock In the settings section, the corresponding options can be shown and configured there. Attention: The start point of this filter is not updated automatically. Only the existing times are used when shown. The end time point is not defined with this filter, it is carried over.
Time period	Active: A fixed time period is entered. Selection of the area mode from drop-down list: <ul style="list-style-type: none"> ▶ One day ▶ One week ▶ Two weeks

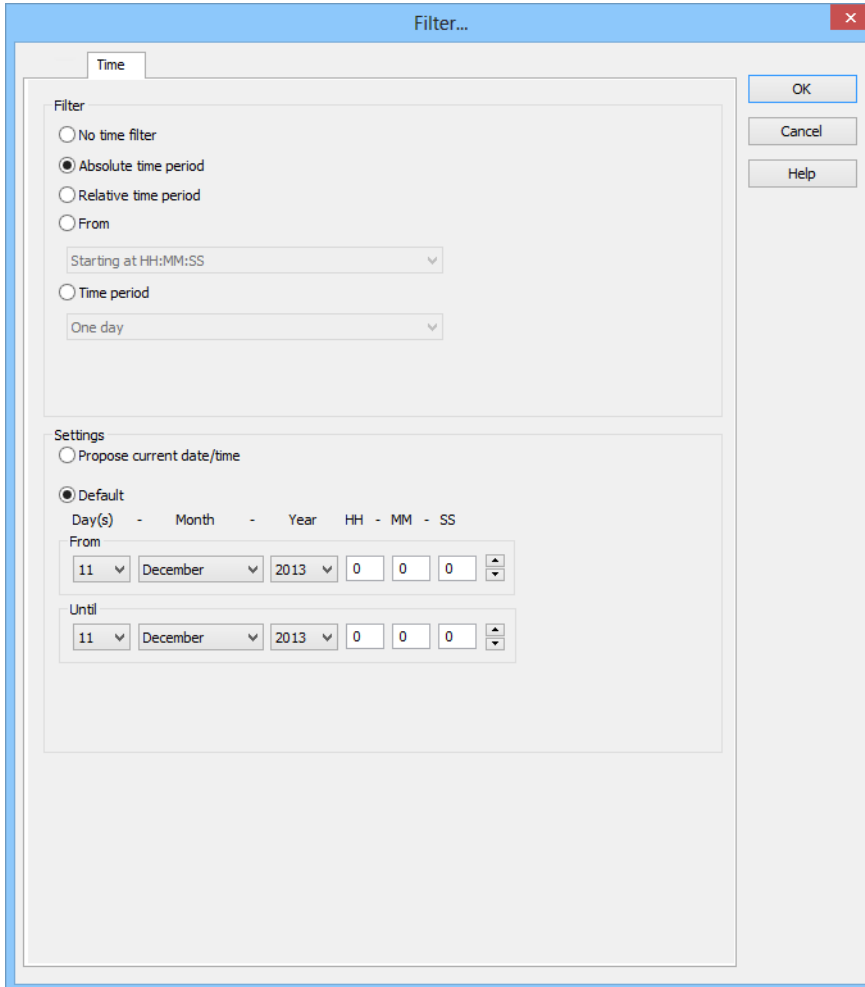
	<ul style="list-style-type: none"> ▶ One month ▶ One Year ▶ 15 minutes ▶ 30 minutes ▶ 60 minutes <p>In the settings section, the corresponding options can be shown and configured there.</p>
OK	Applies all changes in all tabs and closes the dialog.
Cancel	Discards all changes in all tabs and closes the dialog.
Help	Opens online help.

Absolute time period

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

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

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



Filter...

Time

Filter

☐ No time filter

☒ Absolute time period

☐ Relative time period

☐ From

Starting at HH:MM:SS

☐ Time period

One day

Settings

☐ Propose current date/time

☒ Default

Day(s) - Month - Year HH - MM - SS

From

11 December 2013 0 0 0

Until

11 December 2013 0 0 0

OK

Cancel

Help

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

Relative period of time

A relative time period is entered.

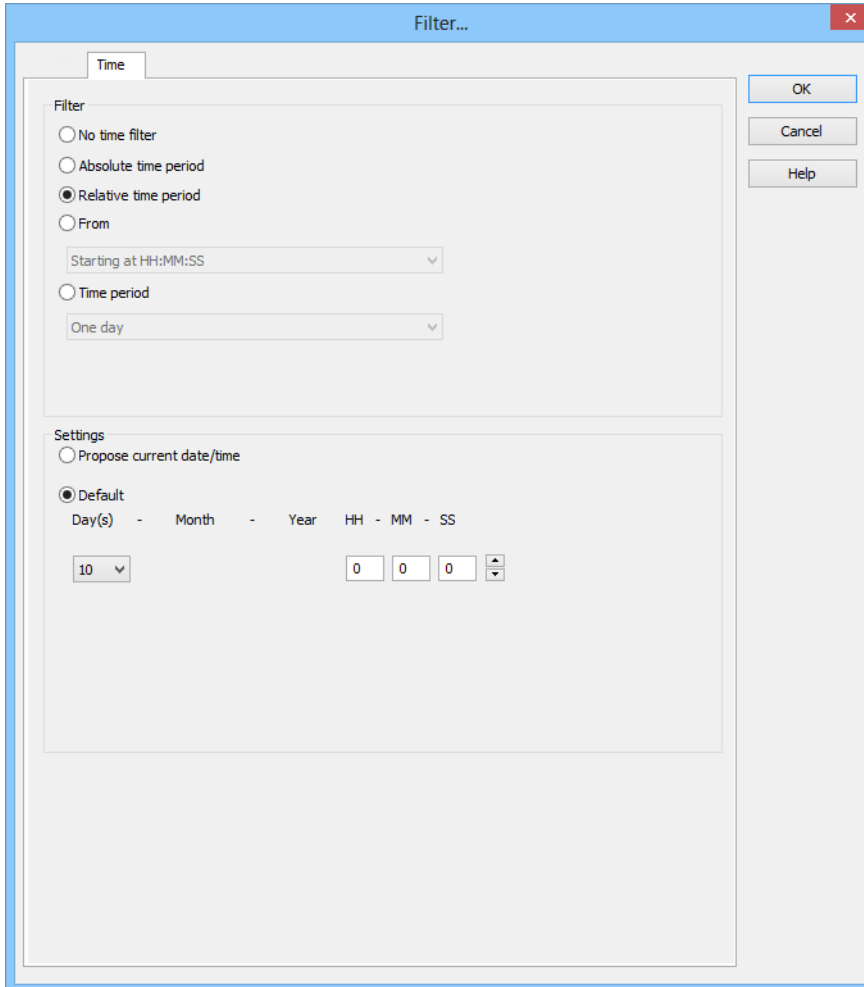
Attention: This filter is updated constantly and continues to run.

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

To set the filter:

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

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



Filter...

Time

Filter

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

Starting at HH:MM:SS

Time period

One day

Settings

- ☐ Propose current date/time
- ☒ Default

Day(s) - Month - Year HH - MM - SS

10 0 0 0

OK Cancel Help

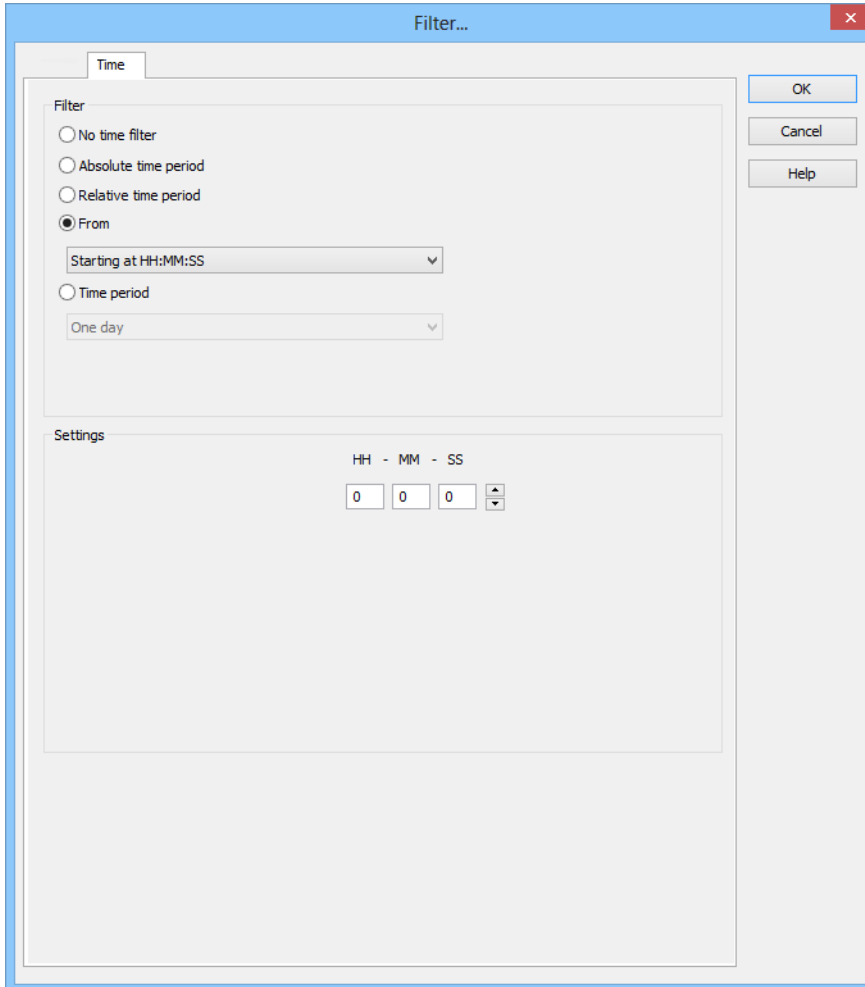
Parameters	Description
Options	Configuration of the time filter.
Propose current date/time	Active: Time filter is displayed in Runtime.
Default	Active: The time filter is prescribed in the Editor. Only the start time can still be configured in Runtime. Selection of the relative time period in days, hours,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

From

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

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

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



Filter...

Time

Filter

☐ No time filter

☐ Absolute time period

☐ Relative time period

☒ From

Starting at HH:MM:SS

☐ Time period

One day

Settings

HH - MM - SS

0 0 0

OK

Cancel

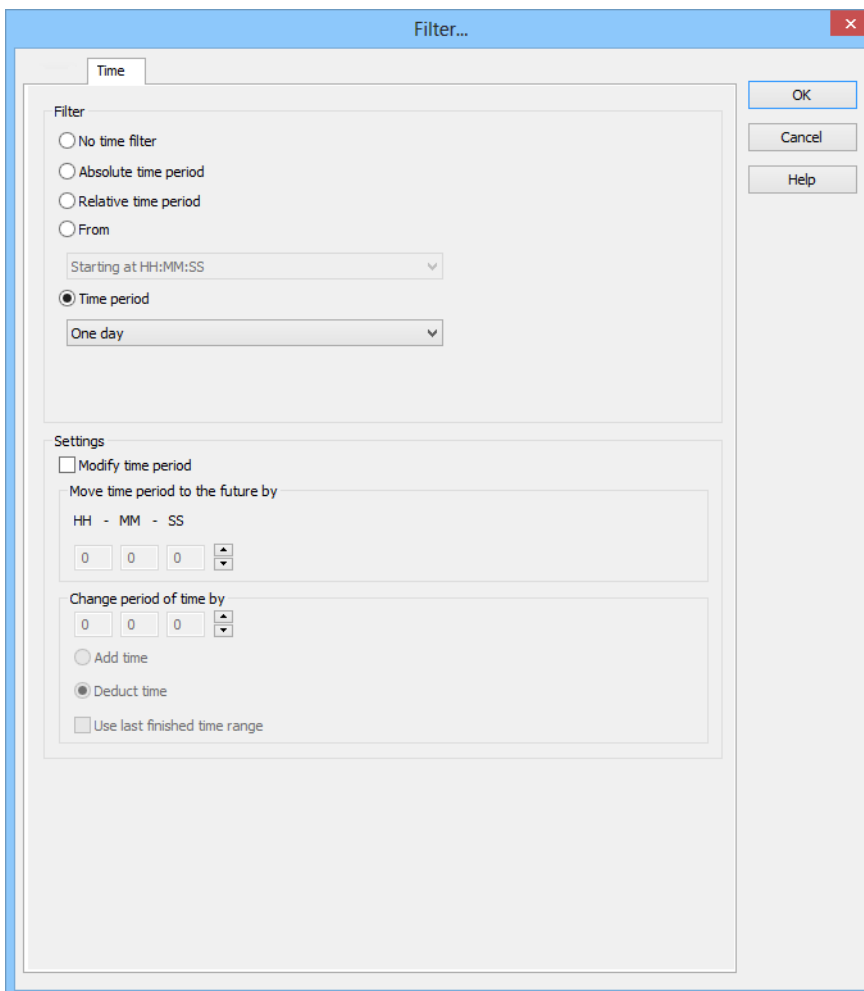
Help

Parameters	Description
Options	Configuration of the time filter.
[Date/Time]	<p>Depending on the settings of the Off option, the time from which the filter is effective is configured here:</p> <ul style="list-style-type: none"> ▶ From HH:MM:SS o' clock ▶ From day - HH:MM:SS o' clock ▶ From day, month - HH:MM:SS o' clock <p>Attention! The start point of this filter is not updated automatically. Only the existing times are used when shown, even if the screen remains open and 23:00:00 is reached. The end time point is not defined with this filter, it is carried over.</p>
▶ From HH:MM:SS o' clock	<p>A time from which the filter is effective is stated. If the time is not reached on the current day, filtering takes place from the corresponding time the previous day.</p> <p>Example: You enter 23:00:00. If it is then 23:30 when executing the function, then it is filtered from 23:00:00 up to the current point in time. If it is 22:30 however, then filtering takes place from 23:00:00 on the previous day to the current point in time.</p>
▶ From day - HH:MM:SS o' clock	<p>A day and time for the start of the filter are entered. If the time given has not been reached in the current month, the corresponding time from the previous month is used.</p> <p>Example: You enter day 5 - 23:00:00. If it is the 10th of the month at 23:30, then filtering takes place from the 5th of the month from 23:00:00 to the current time point. If, however, it is the 4th of the month, then filtering takes place from the 5th of the previous month to the current time point.</p>
▶ From day, month - HH:MM:SS o' clock	<p>A month, day and time for the start of the filter are entered. If the time stated has not been reached in the current year, the corresponding time from the previous year is used.</p> <p>Example: You enter Day 5, Month October - 23:00:00. If it is October 10th at 23:30, then filtering takes place from October 5th from 23:00:00 to the current time point. If, however, it is only October 4th, then filtering takes place from the 5th of the previous year to the current time point.</p>
OK	Applies all changes in all tabs and closes the dialog.
Cancel	Discards all changes in all tabs and closes the dialog.
Help	Opens online help.

Time period

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

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



The screenshot shows the 'Filter...' dialog box with the 'Time' tab selected. The 'Filter' section has four radio buttons: 'No time filter', 'Absolute time period', 'Relative time period', and 'From'. The 'Time period' option is selected. Below it is a dropdown menu showing 'One day'. The 'Settings' section has a checkbox for 'Modify time period' which is unchecked. Below it is a section for 'Move time period to the future by' with input fields for HH, MM, and SS, all set to 0. Below that is a section for 'Change period of time by' with input fields for HH, MM, and SS, all set to 0. There are two radio buttons: 'Add time' (unchecked) and 'Deduct time' (checked). At the bottom is a checkbox for 'Use last finished time range' which is unchecked. On the right side of the dialog are three buttons: 'OK', 'Cancel', and 'Help'.

Parameters	Description
Options	Configuration of the time filter.
Modify time period	<p>Allows amendments to cycles, postponements and extensions of time periods.</p> <p>Active: Evaluation is carried out in accordance with the following rules:</p> <ul style="list-style-type: none"> ► First, the Use last finished time period option is evaluated. ► After this, Change time period by is used. ► Move time period to the future by is then applied. <p>Inactive: No changes to the time period are made.</p> <p>Attention: With version 7.10, filter actions on the basis of this function led to different results than those in the versions before.</p>
Move time period to the future by	<p>Active: The time period defined in the filter is postponed to the future. Given in hours - minutes - seconds.</p> <p>If a postponement that is the same or greater than the selected time period is set, a note to check the configuration is displayed.</p>
Change period of time by	<p>Active: The time period defined in the filter is modified. Given in hours - minutes - seconds.</p> <p>If a change and a postponement that are the same or greater than the selected time period is set, a note to check the configuration is displayed.</p>
Add time	Active: The time stated in Change time period by is added to the time defined in the Time range option.
Deduct time	Active: The time stated in Change time period by is deducted from the time defined in the Time range option.
Use last finished time period	Active: The last finished time period is used.
OK	Applies all changes in all tabs and closes the dialog.
Cancel	Discards all changes in all tabs and closes the dialog.

Help	Opens online help.
------	--------------------

Define time period in the Editor

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

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



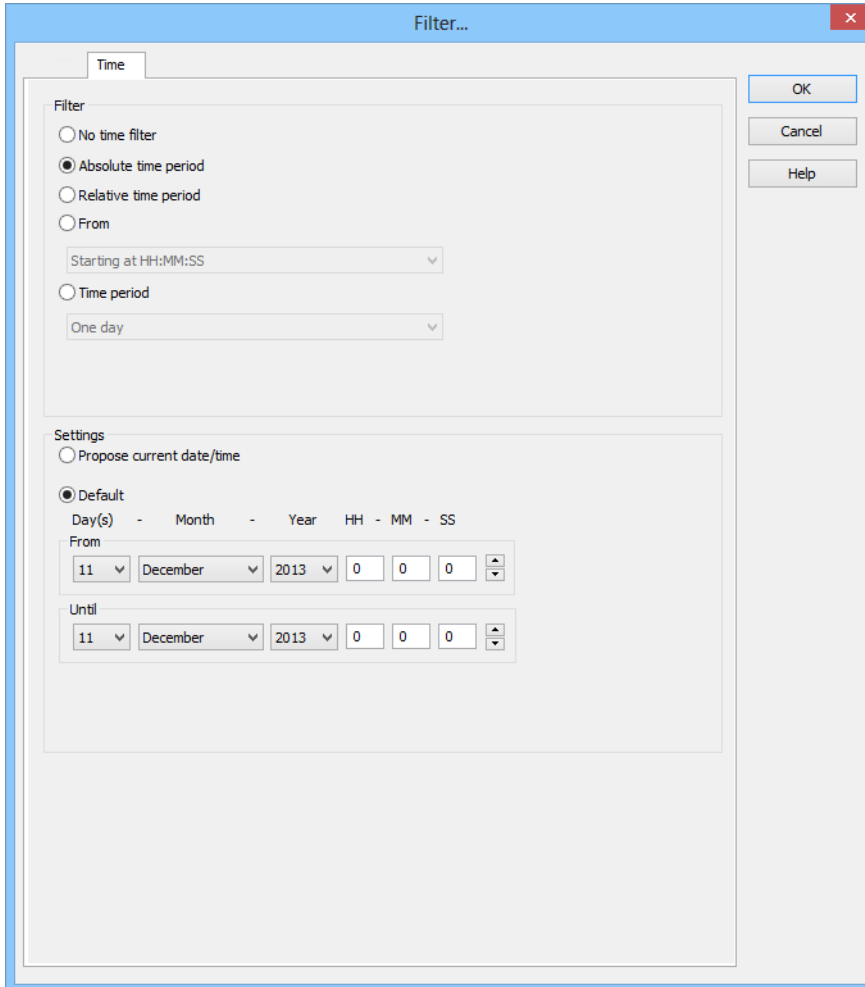
Attention

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

To create the filter:

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

3. Configure the selected time period



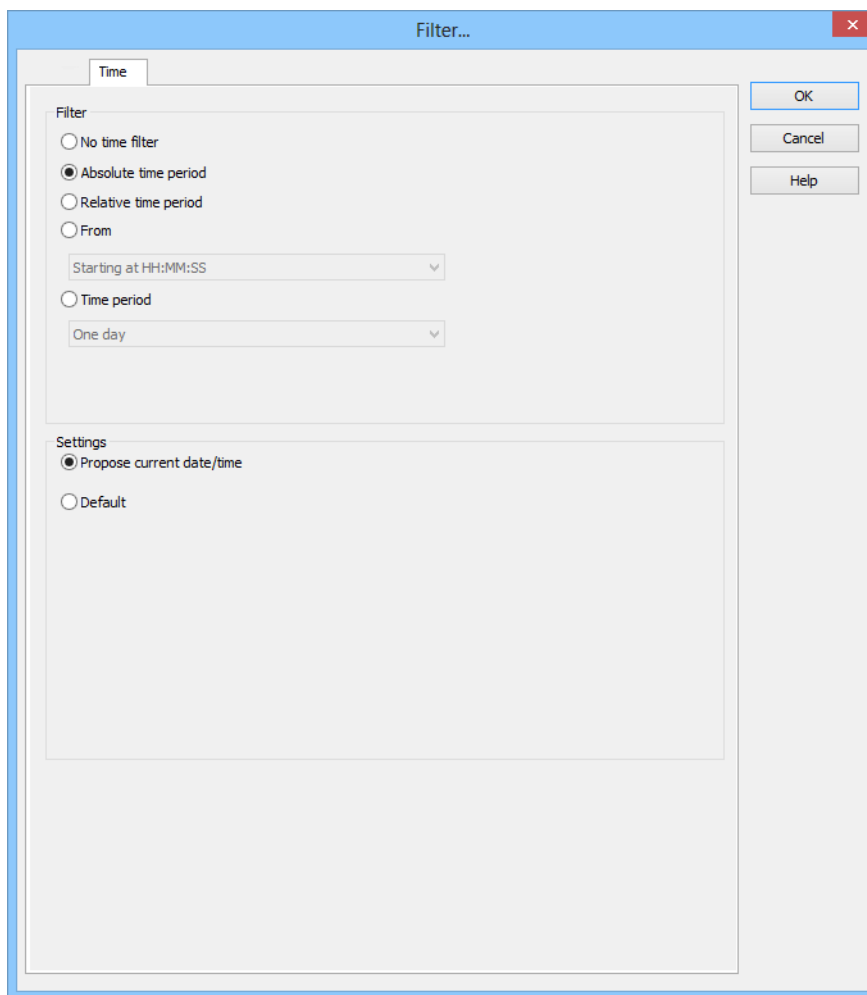
The screenshot shows the 'Filter...' dialog box with the 'Time' tab selected. The 'Filter' section contains four radio buttons: 'No time filter', 'Absolute time period' (which is selected), 'Relative time period', and 'From'. Below these are two dropdown menus: 'Starting at HH:MM:SS' and 'Time period' (currently set to 'One day'). The 'Settings' section contains two radio buttons: 'Propose current date/time' and 'Default' (which is selected). Below the 'Default' radio button are two date and time pickers labeled 'From' and 'Until'. Both pickers are set to '11' for the day, 'December' for the month, '2013' for the year, and '00:00:00' for the time.

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

Time filter can be configured in Runtime

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

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



17.6 Faceplate

Faceplate is the term for a zenon screen that can accept several screens of different types using screen containers and display these consecutively in Runtime. For example, with faceplates:

- ▶ Several screens can be displayed in a screen at the same time
- ▶ Several time filters can be applied to the same screen type at the same time
- ▶ Data from a screen can be applied to another screen using a filter

PERMITTED SCREEN TYPES FOR FACEPLATES

The following screen types can be linked in faceplates:

- ▶ AML
- ▶ AML filter
- ▶ Equipment model
- ▶ CEL
- ▶ CEL filter
- ▶ ETM
- ▶ HTML
- ▶ Report Generator
- ▶ Report Viewer
- ▶ Standard
- ▶ Time filter



Attention

Faceplates are not suitable for worldview.

Background: Linked screens are not scaled in screen containers, but always shown in their original size.

FACEPLATES IN THE DETAIL VIEW

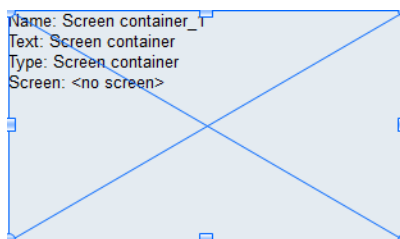
Subscreens linked in faceplates are displayed as a group below the faceplate screen in the detail view.

It is possible to filter the subscreens in the **Name** column. All subscreens appropriate to the filter and the respective faceplate are displayed. Subscreens can be copied, but no longer edited.

17.6.1 Creating a faceplate screen

A faceplate screen consists of screen containers and the optional buttons **Filter** and **Filter editable**.

SCREEN CONTAINER:



Screen containers show the name of the container and the name of the and type of linked screen. For screens that have already been linked, this information is accentuated by automatically-defined background colors. This information in the Editor thus always overlays the content of the linked screen that is positioned at the same location.

The size of the container can be adapted to the size of the linked screen. To do this, navigate to the **Accept size of linked screen** property in the **Position** group. Clicking on the **...** button accepts the size of the linked screen for the container.

FACEPLATE SCREEN

Faceplate screen with linked CEL screen:



Control elements	Description
Insert template	<p>Opens the dialog for selecting a template (on page 331) for the screen type.</p> <p>Templates are shipped together with zenon and can also be created by the user.</p> <p>Templates add pre-defined control elements to pre-defined locations in the screen. Elements that are not necessary can also be removed individually once they have been created. Additional elements are selected from the drop-down list and placed in the screen. Elements can be moved in the screen and placed individually.</p>
Screen container	<p>Element that is linked to an existing screen as displays the content of the linked screen in Runtime.</p> <p>Several screen containers can be used in a <code>faceplate</code> screen.</p> <p>If the option <code>Border around dynamic elements</code> (Options -> Settings) has been activated, then a symbol is displayed in the upper right-hand corner. This indicates that the content is linked.</p>
Filter	<p>Calls up a window in Runtime with the filters configured in the Editor. Only filters that have been unlocked (on page 423) can be edited.</p>
Filter editable	<p>Calls up a window in Runtime with the filters configured in the Editor and allows the editing of all filters - regardless of the requirements (on page 423) in the Editor.</p>

CREATING A SCREEN

To create a `faceplate` screen:

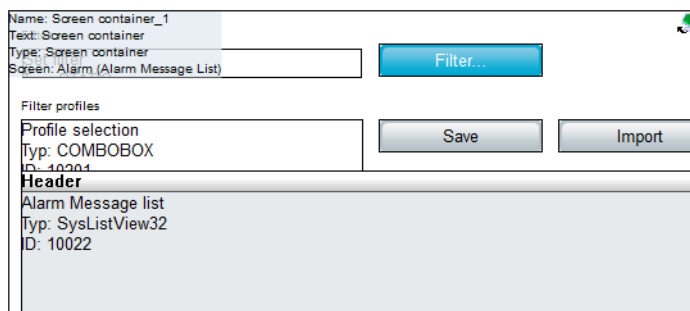
1. Create a new screen
2. Select, as a `Screen type`, `Faceplate` from the drop-down list
3. Open the `Control elements` menu
4. Select `Insert template`
5. Select the template (on page 331) with the desired number of screen containers

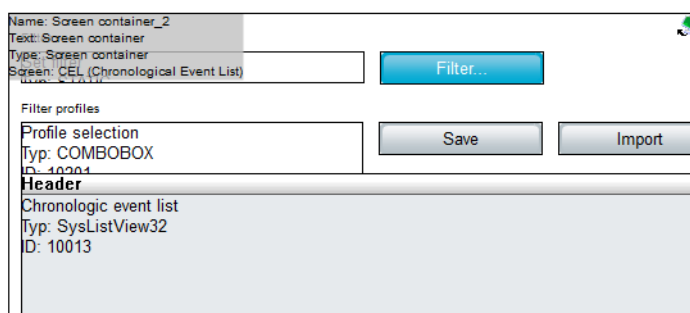
The screen containers are displayed. In addition, the `Filter` and `Filter editable` (on page 439) buttons are created.

6. Link the screen containers that have been created to the desired zenon screens

You have the following options for linking a screen to a container:

- **Drag & drop:**
Move a screen into the container by dragging & dropping it. A symbol is displayed when the mouse is positioned over the target, which indicates if the screen can be linked.
Note: If several screens are moved to a container at the same time by dragging & dropping, the screen that is selected first is linked.
- **Selection via property:**
Select a screen via the `Screen` property in the `Representation` property group. Only permitted screen types are offered for linking.
- **Dialog in the container:**
Call up the dialog to select a screen by double-clicking on the empty screen container. Only permitted screen types are offered for linking.
Note: Double-clicking on a container that has already been filled opens the linked screen.





7. Issue a meaningful name for each screen container in the `General/Element name` property

Hints:

- Double-clicking on the screen container opens:
 - With the screen container empty: the dialog to link a screen

- With the screen container configured: the linked screen in the new tab
- ▶ The `Show preview in the Editor` property can be used to switch the display of the linked screen in the screen container on or off in the Editor. It is recommended that the display is turned off in the event of performance problems.



Information

When giving it a name for the `Element name` property, ensure that there are unique identifications. This is how you ensure that there is a unique selection when creating screen switching.

CREATING SCREEN CONTAINERS MANUALLY

To create screen containers manually:

1. Open the Control Elements menu
2. Select Screen container
3. Drag the screen container into the screen with the mouse
4. The dialog for selecting a screen is opened
5. Select the desired screen from the list and confirm this selection by clicking **OK**
6. Assign a unique name for the screen container
7. Repeat this step for desired screen containers



Information

Only faceplates with permitted screen types can be created in the Editor. However, for the standard screen type, a screen type that is not permitted can subsequently be set. If such screen types are selected in the Editor, the linking is deleted. An empty container is shown in Runtime

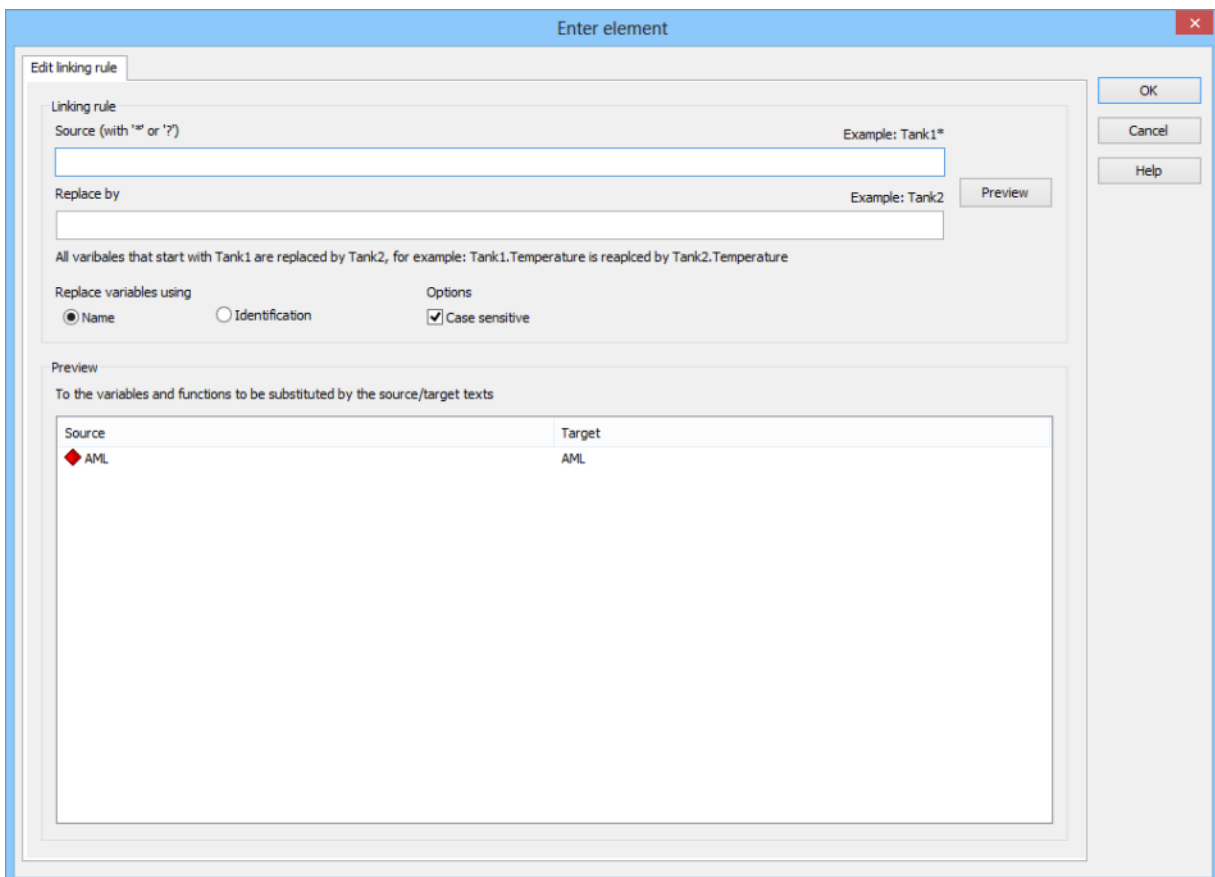
17.6.2 Replace links

Functions, variables, locking variables and ALC aliases linked in the container can be replaced automatically.

To replace links:

1. Navigate to the `Linking` rule group in the properties of the container.
2. Configure the corresponding replacements directly or use the dialog.
3. Clicking on the ... button in the `Preview` property opens the dialog to configure and preview the replacements.

Replacements for several containers can be undertaken at the same time using multiple selection. In this case, the rules must be defined using the properties. The dialog with the preview is then not available.



The screenshot shows a dialog box titled "Enter element" with a tab labeled "Edit linking rule". The dialog is used to configure linking rules for replacing source text with target text.

Linking rule section:

- Source (with '*' or '?'):** A text input field with an example "Example: Tank1*".
- Replace by:** A text input field with an example "Example: Tank2".
- Preview:** A button next to the "Replace by" field.
- Options:**
 - Replace variables using:** Radio buttons for "Name" (selected) and "Identification".
 - Options:** A checkbox for "Case sensitive" which is checked.
- Preview section:**
 - To the variables and functions to be substituted by the source/target texts:** A table with two columns: "Source" and "Target".
 - Table content:**

Source	Target
AML	AML

Buttons on the right side of the dialog: OK, Cancel, Help.

Property	Description
Linking rule	Configuration of which character sequence can be replaced and how.
Source	Enter the character string to be searched for. Permitted wildcards: * and ? Wildcards are only allowed as prefix or suffix; e.g. *xxx or xxx*.
Replace by	Entry of the character string that is to be replaced.
Name	Swaps information in process variable names.
Identification	Exchanges information in the identification
Note capitalization	When swapping, be sure that any capitalization is an exact match.
Combined names	Permitted combined names. Is not available for ALC aliases and faceplate containers (on page 416). These are always used without a symbol prefix.
Preview	Display of the selected and replaced elements.
OK	Applies settings and closes the dialog.
Cancel	Discards all changes and closes the dialog.
Help	Opens online help.

You can find further details on automatic replacement of variables and functions in the chapter on replacing linking of variables and functions (on page 240) .

Hint: Ensure that the variables are named (on page 241) clearly and sensibly from the start.

The defined linking rule is applied to the following objects if they are present in the screen:

- ▶ Functions
- ▶ Variables
- ▶ Interlocking variables
- ▶ ALC aliases

PROCESS

When switching to a faceplate screen, the linking rule for the objects to be replaced using the linking rule configured for the screen container is displayed in the preview list of the screen switching. The

preview of the screen container also already shows the objects that have been replaced. Different screen containers can use the same screen, but define different linking rules.

In Runtime, only the replacement rule configured for the screen container is applied to the linked screen. Then, if configured, the linking rule is applied to the screen switching function.

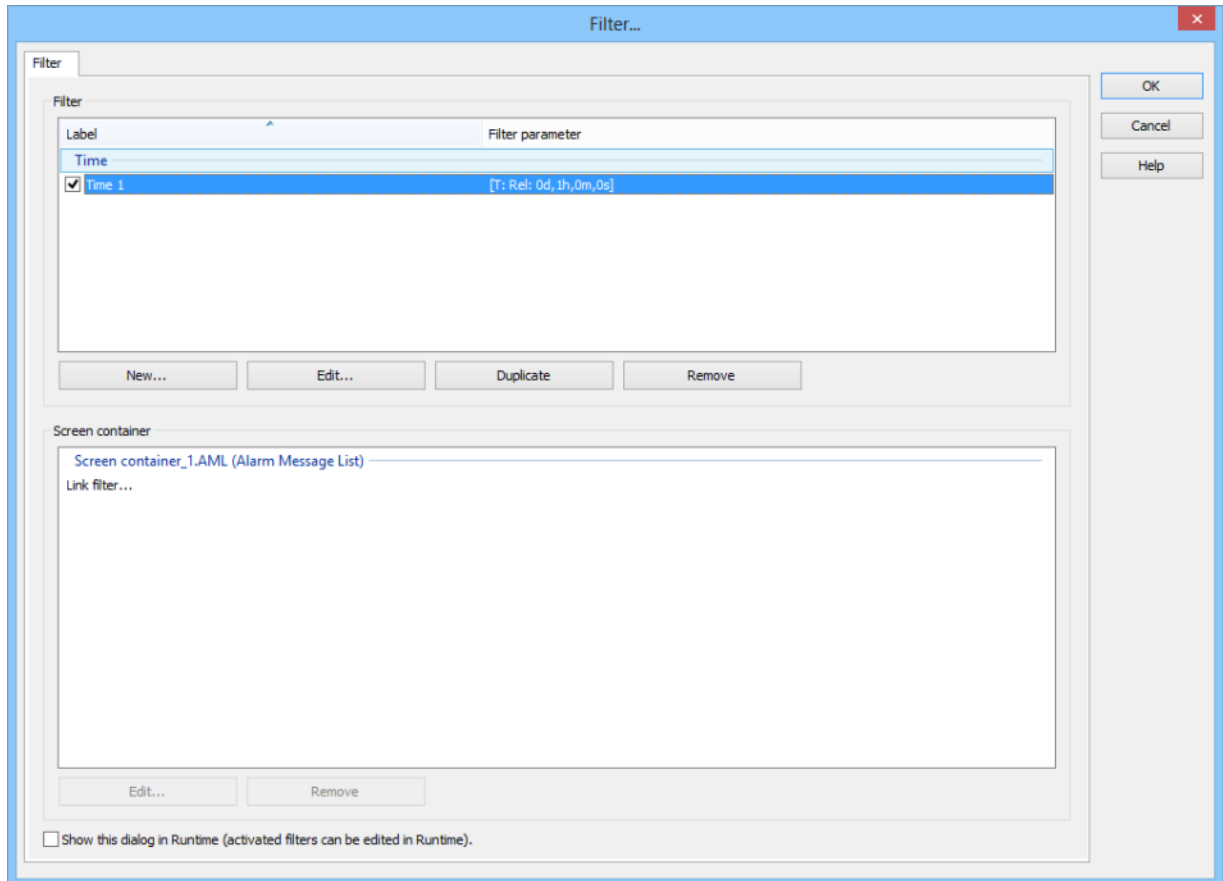
If a linking rule cannot be deleted in Runtime, a LOG entry is created.

17.6.3 Configuring screen switching

To create a new function to call up a `variable diagnosis` screen:

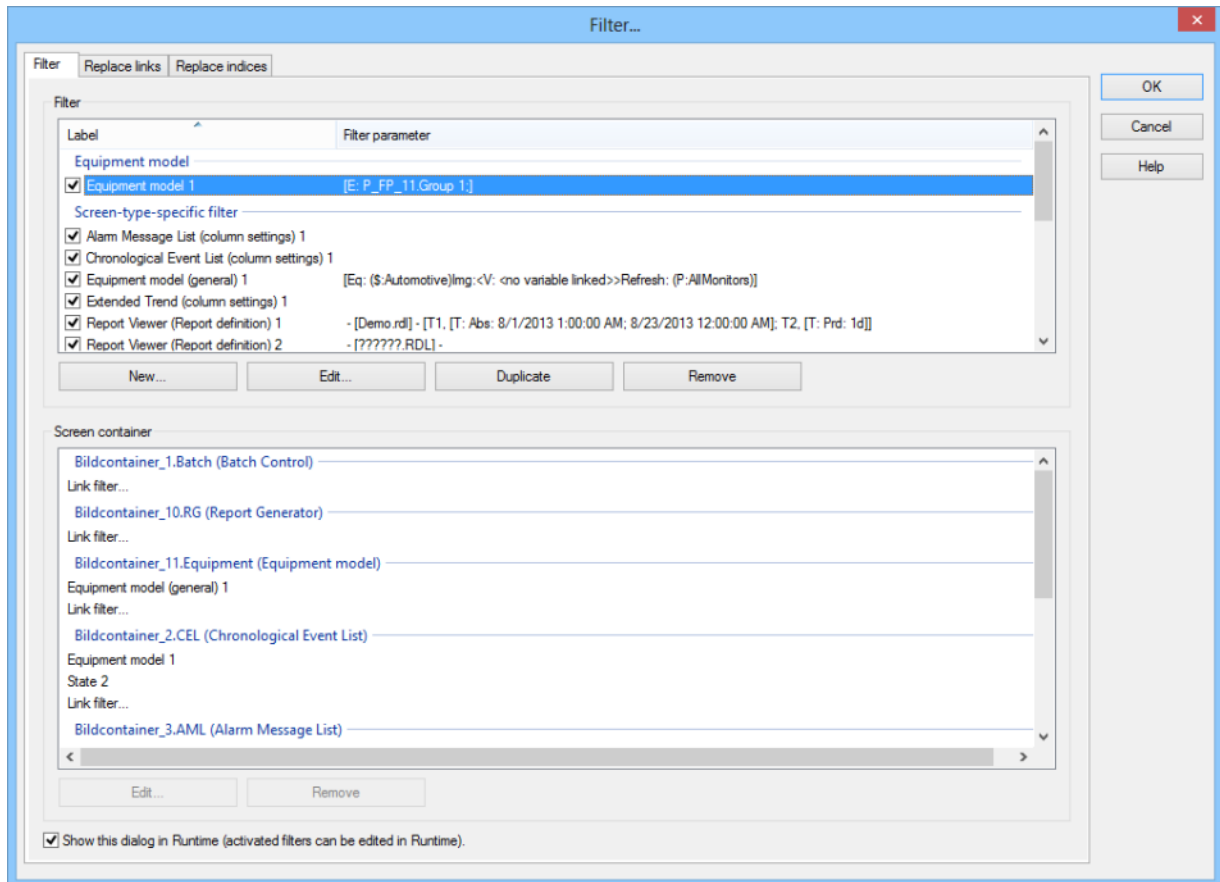
1. select **New Function**
2. select **Screen switching**
3. Select `faceplate` screen (on page 417) or a subscreen linked in the faceplate

4. The dialog for configuring and linking filters is opened



5. Configure (on page 428) the desired filter
Tip: You can configure different filters of the same type
6. Link (on page 433) screen containers to the filter
Note: Only filters that are supported by the screen type in the screen container can be supported.
AML, CEL, time and equipment model filters can be applied to subscreens
7. Confirm the configuration by clicking on the **OK** button

FILTER DIALOG

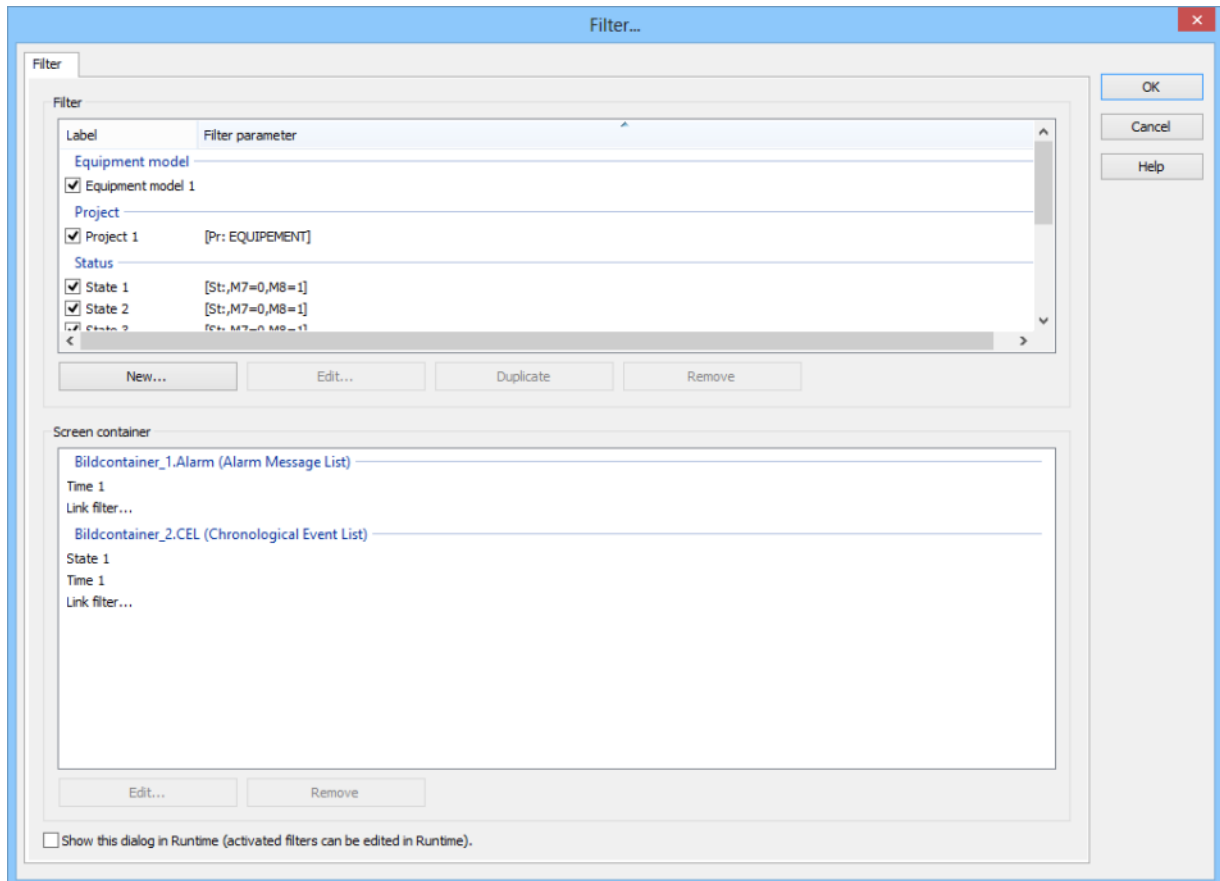


Parameters	Description
Filter	Tab to configure the filters for screen containers in the faceplate.
Replace links	Tab in which the linked variables can be replaced.
Replace indices	Tab in which the indexes can be replaced.
List of filters	<p>List of all filters created. These filters can be allocated individual screen containers.</p> <p>The list is sorted alphabetically according to filter. The entries in each group can be sorted according to description or filter parameters by clicking on the column title.</p>
Checkbox	<p>Active: If the option Offer this dialog in Runtime has been activated for the dialog, this filter is available in Runtime for configuration.</p> <p>Inactive: This filter cannot be selected in Runtime.</p> <p>Default: active</p>
New	<p>Opens the dialog (on page 428) to select a filter type and creates a new filter in the list accordingly.</p> <p>Shortcut: Ins key</p>
Edit	<p>Opens a configuration dialog depending on the filter type.</p> <p>The dialog can also be opened by double clicking on the filter in the list.</p>
Duplicate	Copies the selected filter and inserts it with a new name into the group of the corresponding filters.
Remove	<p>Removes the currently-selected filter from the list.</p> <p>Shortcut: Del key</p>
Screen container	Assignment of filters to screen containers.
List of filters	<p>Lists all screen containers and the respective linked filters.</p> <p>The names of the containers consist of: Identifiers for the screen container plus the name of the screen plus the screen type.</p> <p>Filters that have already been linked are displayed alphabetically below the container name. Each container entry has a Link filter button. Clicking the Link filter button opens the dialog to select a filter.</p>
Link filter	Clicking this opens the dialog (on page 433) to select a filter that is to be linked to the container. Only filters that can be linked to the selected container are

	<p>shown.</p> <p>Several filters per container can be selected, however not several screens of the same type. Filter types that are already linked to the respective screen container are no longer available for selection.</p> <p>This button is displayed for each screen container at the end of its filter list.</p>
Edit	<p>Opens a configuration dialog depending on the filter type.</p> <p>The dialog can also be opened by double clicking on the filter in the list.</p>
Delete	<p>Deletes the linking of the currently-selected filter to the screen container.</p> <p>Shortcut: Del key</p>
Show this dialog in the Runtime	<p>Active: This dialog is opened in Runtime before the function is executed.</p> <p>Only filters whose checkboxes have been activated in Runtime are offered for editing in Runtime. All other filters are displayed but cannot be edited.</p> <p>Note: This setting can be overcome in Runtime in the screen with the Filter editable (on page 417) button.</p>
OK	Applies settings and closes the dialog.
Cancel	Discards all changes and closes the dialog.
Help	Opens online help.

Create a new filter

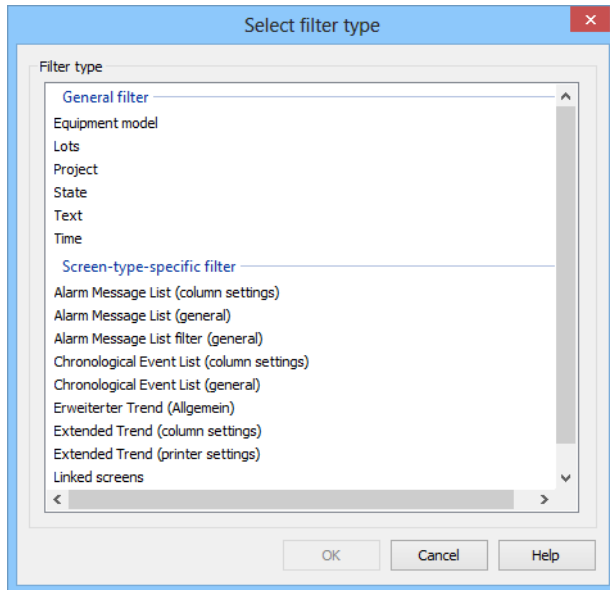
Filters for screen containers are created and administered in the upper area of the **Filter** tab.



To create a filter:

1. Click on the **New** button.

2. The dialog for selecting a filter type is opened



3. The following are displayed:

- General filter
- Screen-type-specific filter

4. select the desired filter.

You can select several filters at the same time:

- **Ctrl+mouse click:** selects all filters clicked
- **Mouse click -> Shift key + mouse click:** selects all filters between the first and the second click
- **Clicking on the filter heading:** selects all filters of this group
- **Ctrl+A:** selects all filters
- **Ctrl+D:** deselects all filters
- **Shift+[letter]:** selects the next filter that starts with the corresponding letter

If only one filter is selected, clicking on OK opens the corresponding configuration dialog. No dialog is opened if several filters are selected. Each selected filter must be configured manually once it has been created.

5. Configure the filter.
6. close the configuration by clicking **OK**.

FILTER TYPES

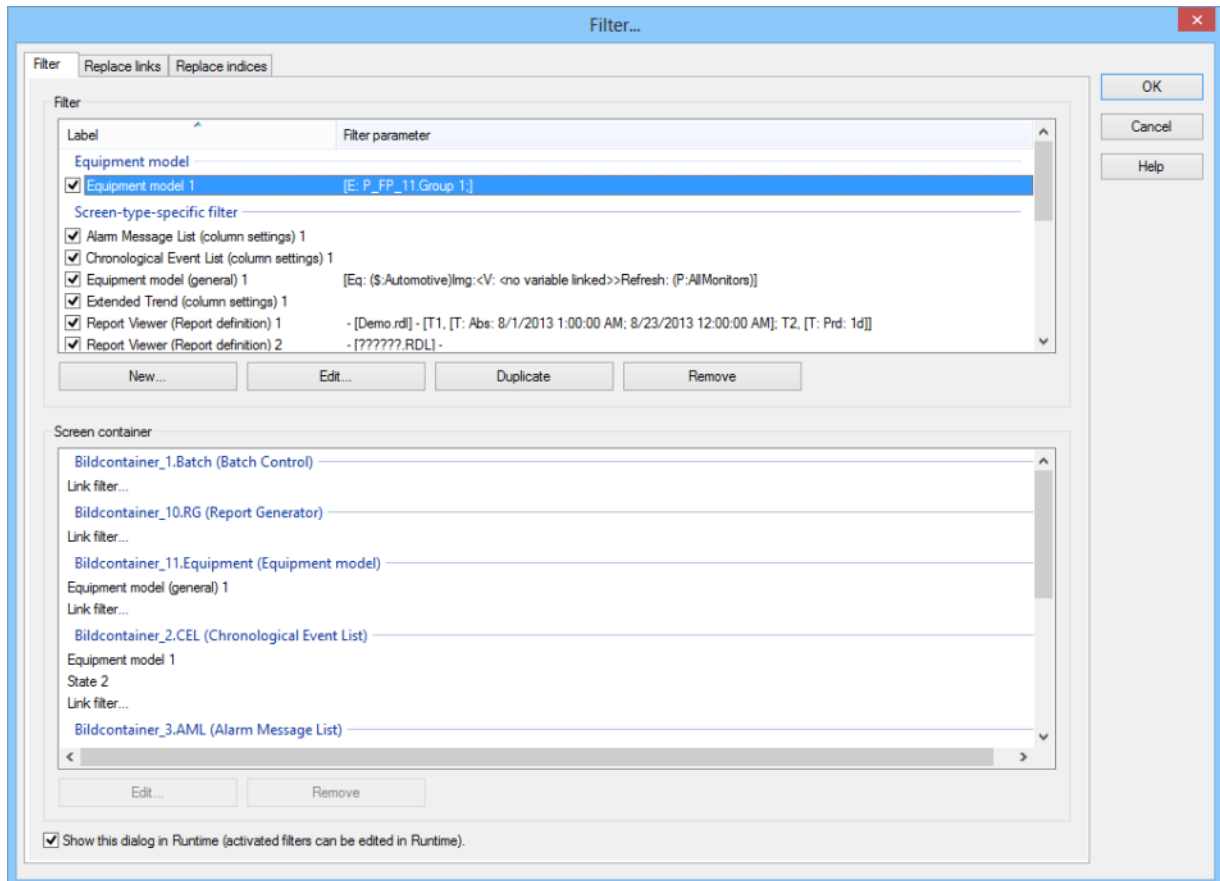
Different filter types are available for faceplates. During configuration, only filters that are suitable for the screen types present in the faceplate are offered. If, for example, none of the linked screen types uses lots, then the lot filter is also not offered.

Filter	Description
General filter	Filters that are available regardless of the configured screen types.
Time	Configuration of time filters.
Text	Limitation of the display to messages that contain certain search terms.
Lots	Configuration of a lot filter. Available if, in the faceplate, an AML, CEL, Extended Trend or Report Generator screen is linked.
Status	Configuration of the status that is to be filtered.
Equipment model	Configuration of a filter for equipment groups from the global project or the local project.
Project	<i>Selection of the projects of an integration project that are to be filtered.</i> Note: Generally only available if several projects have been created in an integration project. With the filter configuration for faceplates, the project filter is also offered for individual projects.
Screen-type-specific filter	Filters that are available depending on the configured screen types.
Alarm Message List (general)	Configuration of which alarms are displayed.
Alarm Message List (column settings)	Configuration of which columns of the AML are displayed, including the sequence and sorting.
Equipment model (general)	Configuration of the filter for an equipment model screen.
Chronological Event List (general)	Configuration of which events are displayed.
Chronological Event List (column settings)	Configuration of which columns of the CEL are displayed, including the sequence and sorting.
Extended Trend (general)	Configuration of the following settings for Extended Trend: <ul style="list-style-type: none"> ▶ Data ▶ Representation ▶ X-axis
Extended Trend (printer)	Configuration of the printer settings for Extended Trend.

settings)	
Extended Trend (column settings)	Configuration of the column settings for Extended Trend.
HTML (general)	Configuration of the filter for an HTML (on page 444) screen.
Report Generator (file)	Configuration of the report file of the Report Generator to be called up.
Report Generator (parameters)	Configuration of the parameters of the Report Generator to be used.
Report Viewer (report definition)	Configuration of the report definitions of the Report Viewer to be used.
Linked screens	Configuration of the linked screens (on page 395) for time filters, Alarm Message List (on page 395) and Chronological Event List (on page 395).

Linking filters

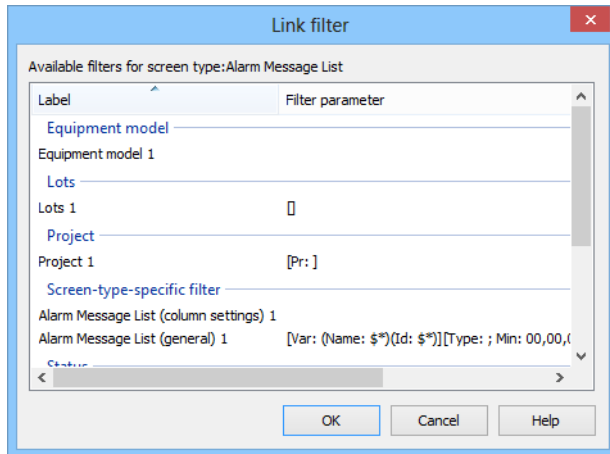
Filters for screen containers are linked and administered in the lower area of the **Filter** tab.



To link a screen container to a filter:

1. Click, in the screen container window, on the **Link filter** button.

2. The dialog to link a filter is opened



3. Select the desired filter.
4. Confirm the linking by clicking on the OK button

SELECTION OF FILTER FOR LINKING

Several filters can be linked to each screen container. However only one filter can be linked per filter type. Filter types that are already linked to the respective screen container are no longer available for selection.

The list of filters is sorted alphabetically according to filter. The entries in each group can be sorted according to **description** or **filter parameters** by clicking on the column title.

Several filters can be selected at the same time.

- ▶ **Ctrl+mouse click:** selects all filters clicked
- ▶ **Mouse click -> Shift key + mouse click:** selects all filters between the first and the second click
- ▶ **Clicking on the filter heading:** selects all filters of this group
- ▶ **Ctrl+A:** selects all filters
- ▶ **Ctrl+D:** deselects all filters
- ▶ **Shift+[letter]:** selects the next filter that starts with the corresponding letter

Transfer of filters when screen switching to other screen types

For screen switching to certain screen types, `Faceplate` screens or subscreens of a faceplate can be selected as the screen to be called up or screen to be refreshed. If the `faceplate` screen is selected as the screen to be updated, the filter is applied to all suitable subscreens.

Screen types that allow faceplates and subscreens as a source/target with screen switching:

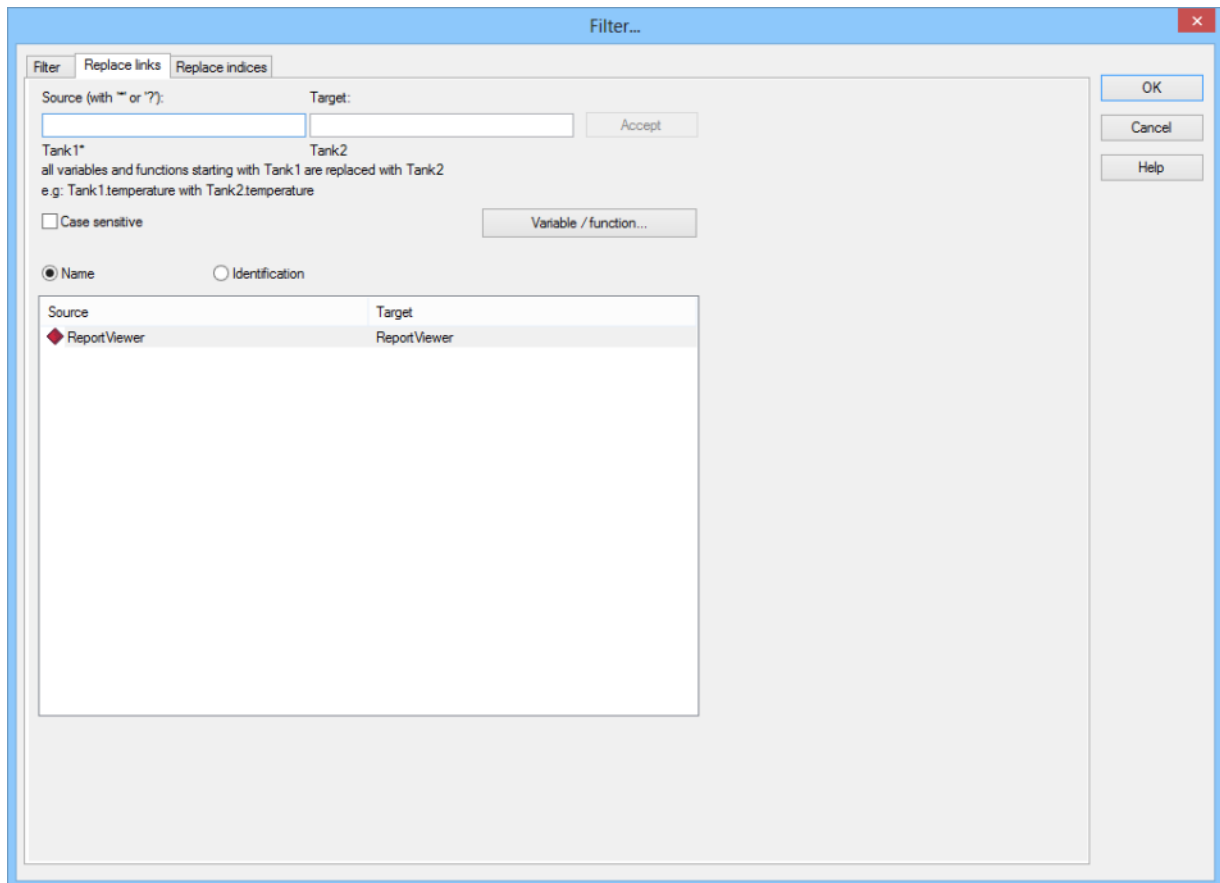
- ▶ AML filter
- ▶ Equipment model
- ▶ CEL filter
- ▶ Time filter

Supported screen containers in the faceplate that is selected as the `screen to be updated`:

- ▶ AML
- ▶ AML filter
- ▶ Equipment model
- ▶ CEL
- ▶ CEL filter
- ▶ Extended Trend
- ▶ Time filter

Replace linking and indexes

In this tab, all variables and functions of linked screens are listed. These can also be replaced automatically as with other screen switching.



For details see:

- ▶ Replacing linking of variables and functions (on page 240)
- ▶ Replacing linking with screen switching (on page 244)
- ▶ Replacing indexes (on page 248)

PARTICULAR FEATURE WHEN REPLACING FACEPLATE SCREENS

The settings for the replacement of variables and functions are applied not just in a `faceplate` screen, but also in all embedded screens. Replacements that have already been configured (on page 421) for the container via the properties of the `Linking rule group` are displayed in the **Replace linking** tab. In Runtime, only the replacement rule configured for the screen container is applied to the linked screen. Then, if configured, the linking rule is applied to the screen switching function.

EXAMPLE:Initial situation:

- ▶ The faceplate screen contains a variable, **Test1**, and a screen, **CEL**.
- ▶ The CEL screen also contains a variable **Test1**.
- ▶ When switching screens, the variable **Test1** is replaced by **Test2**.

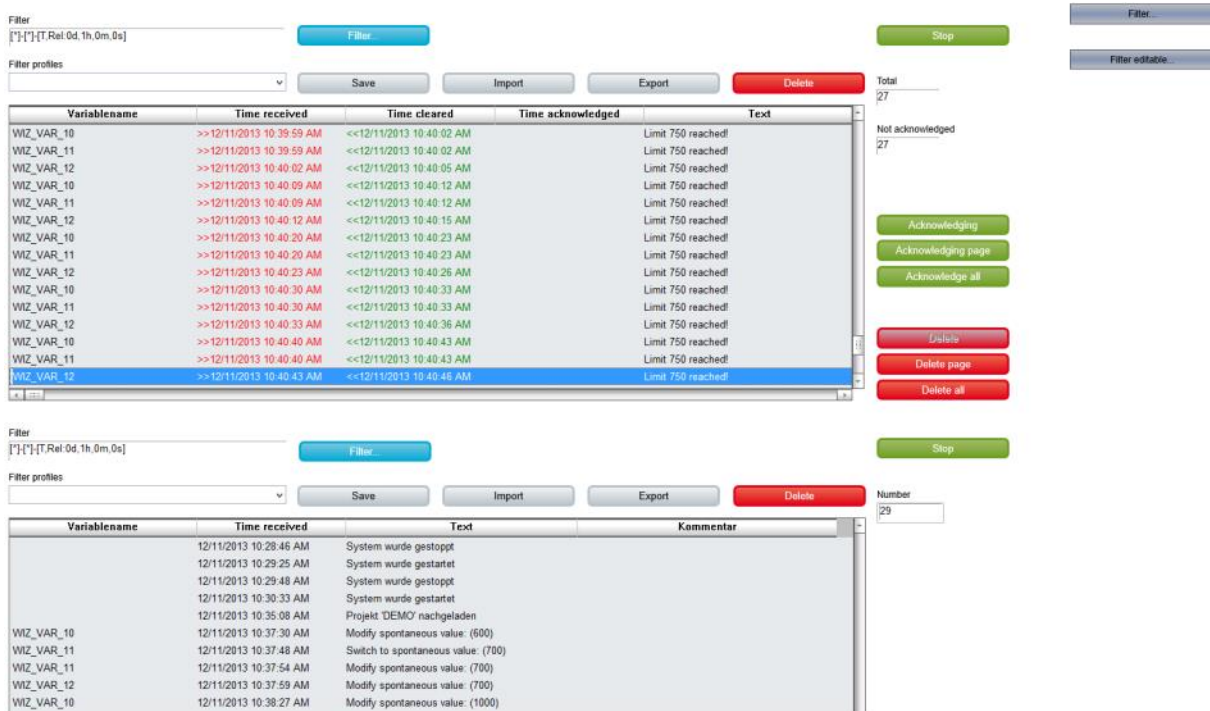
Result:

- ▶ The faceplate screen is called up and displays, instead of the variable **Test1**, the variable **Test2**.
- ▶ The linked **CEL** screen is displayed as embedded.
- ▶ The variable **Test1** is also replaced by **Test2** in the CEL screen.

17.6.4 Use faceplate in Runtime

In Runtime, at places where screen containers are placed, the screens linked in these are displayed. The screens take on the size of their screen container and can be operated in the same way as all other switched screens.

Two containers with different screens are shown in the following faceplate screen.



Filter: [T] [T] [T] [Rel: 0d, 1h, 0m, 0s] Filter

Filter profiles: Save Import Export Delete

Total: 27

Not acknowledged: 27

Acknowledging Acknowledging page Acknowledge all

Delete Delete page Delete all

Stop

Filter: [T] [T] [T] [Rel: 0d, 1h, 0m, 0s] Filter

Filter profiles: Save Import Export Delete

Number: 29

Variablenname	Time received	Time cleared	Time acknowledged	Text
WIZ_VAR_10	>>12/11/2013 10:39:59 AM	<<12/11/2013 10:40:02 AM		Limit 750 reached!
WIZ_VAR_11	>>12/11/2013 10:39:59 AM	<<12/11/2013 10:40:02 AM		Limit 750 reached!
WIZ_VAR_12	>>12/11/2013 10:40:02 AM	<<12/11/2013 10:40:05 AM		Limit 750 reached!
WIZ_VAR_10	>>12/11/2013 10:40:09 AM	<<12/11/2013 10:40:12 AM		Limit 750 reached!
WIZ_VAR_11	>>12/11/2013 10:40:09 AM	<<12/11/2013 10:40:12 AM		Limit 750 reached!
WIZ_VAR_12	>>12/11/2013 10:40:12 AM	<<12/11/2013 10:40:15 AM		Limit 750 reached!
WIZ_VAR_10	>>12/11/2013 10:40:20 AM	<<12/11/2013 10:40:23 AM		Limit 750 reached!
WIZ_VAR_11	>>12/11/2013 10:40:20 AM	<<12/11/2013 10:40:23 AM		Limit 750 reached!
WIZ_VAR_12	>>12/11/2013 10:40:23 AM	<<12/11/2013 10:40:26 AM		Limit 750 reached!
WIZ_VAR_10	>>12/11/2013 10:40:30 AM	<<12/11/2013 10:40:33 AM		Limit 750 reached!
WIZ_VAR_11	>>12/11/2013 10:40:30 AM	<<12/11/2013 10:40:33 AM		Limit 750 reached!
WIZ_VAR_12	>>12/11/2013 10:40:33 AM	<<12/11/2013 10:40:36 AM		Limit 750 reached!
WIZ_VAR_10	>>12/11/2013 10:40:40 AM	<<12/11/2013 10:40:43 AM		Limit 750 reached!
WIZ_VAR_11	>>12/11/2013 10:40:40 AM	<<12/11/2013 10:40:43 AM		Limit 750 reached!
WIZ_VAR_12	>>12/11/2013 10:40:43 AM	<<12/11/2013 10:40:46 AM		Limit 750 reached!

Variablenname	Time received	Text	Kommentar
	12/11/2013 10:28:46 AM	System wurde gestoppt	
	12/11/2013 10:29:25 AM	System wurde gestartet	
	12/11/2013 10:29:48 AM	System wurde gestoppt	
	12/11/2013 10:30:33 AM	System wurde gestartet	
	12/11/2013 10:35:08 AM	Projekt 'DEMO' nachgeladen	
WIZ_VAR_10	12/11/2013 10:37:30 AM	Modify spontaneous value: (600)	
WIZ_VAR_11	12/11/2013 10:37:48 AM	Switch to spontaneous value: (700)	
WIZ_VAR_11	12/11/2013 10:37:54 AM	Modify spontaneous value: (700)	
WIZ_VAR_12	12/11/2013 10:37:59 AM	Modify spontaneous value: (700)	
WIZ_VAR_10	12/11/2013 10:38:27 AM	Modify spontaneous value: (1000)	



Information

Only faceplates with permitted screen types can be created in the Editor. However, for the standard screen type, a screen type that is not permitted can subsequently be set. If such screen types are selected in the Editor, the linking is deleted. An empty container is shown in Runtime

CHANGES TO FRAMES AND SCREENS

The screens in the containers are adapted to borders and frames.

The screen to be displayed is cut accordingly if:

- ▶ The frame has been configured to be smaller than the screen that it is to display
- ▶ A faceplate screen has been called up as a pop-up and its size has been changed

Editing filters

The filters for the screens in the screen containers configured in the Editor can be edited depending on the settings in Runtime.

FILTER CANNOT BE EDITED

In order for there to be no possibility of editing a filter when a screen is called up in Runtime, deactivate the `Offer this dialog in Runtime (activated filters can be edited in Runtime)` option in the Configuration of screen switching (on page 423).

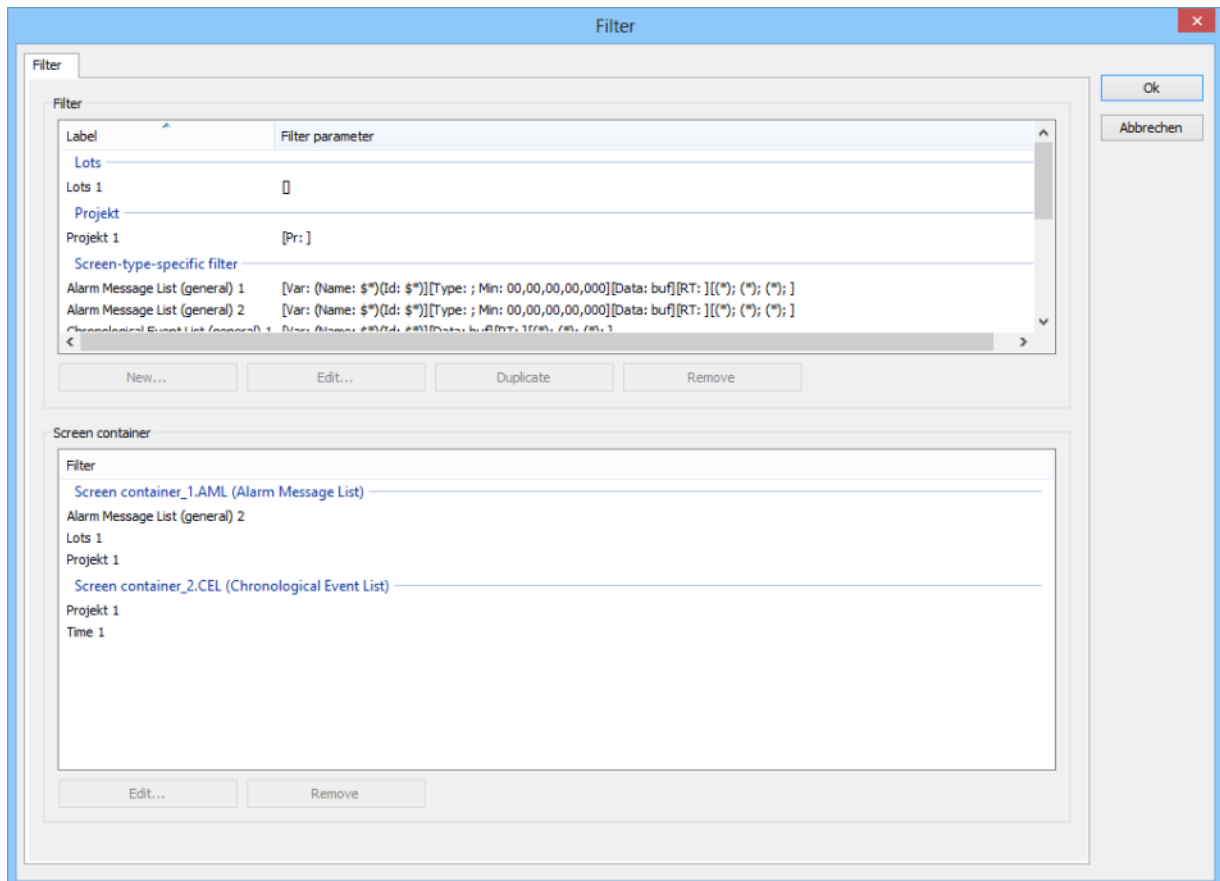
This block can be circumvented with the `Filter editable` button.

SELECTED FILTER EDITABLE

In order for filters to be able to be edited in Runtime when a screen is called up:

- ▶ Activate, in the configuration of screen switching (on page 423),
 - in the `Filter` list, the checkbox for each desired filter
 - The `Offer this dialog in Runtime (activated filters can be edited in Runtime)` option.

The dialog to select and edit the filter is displayed in Runtime when the screen is called up. All filters approved for editing can be selected and edited. All other filters are blocked. However, blocked filters can also be unlocked with the **Filter editable** button.



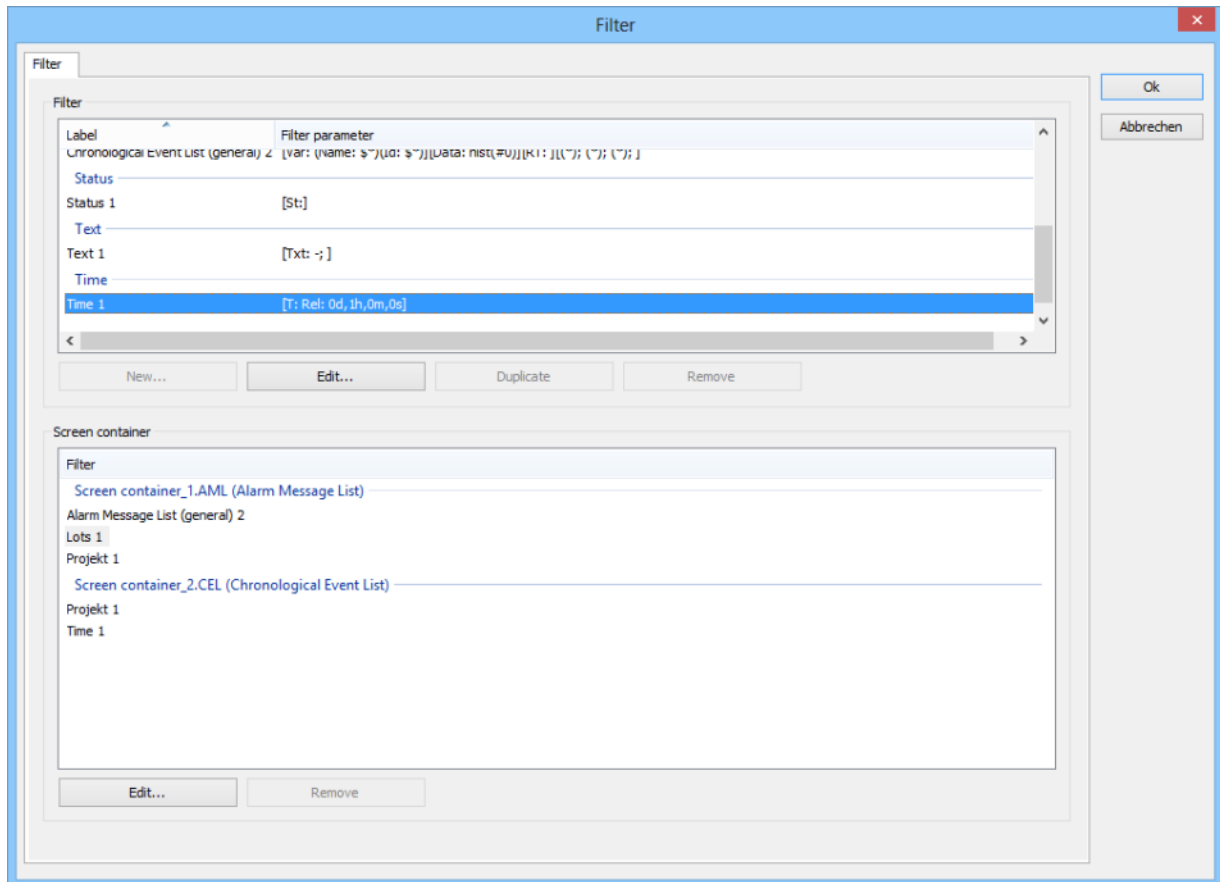
DISPLAY AND EDIT ALL FILTERS IN RUNTIME

The dialog with all filters freely editable can be called up in Runtime with the **Filter editable** button (on page 417).

If filters are only to be edited to a limited extent, but a user is to have unlimited access, then:

1. Configure the screen switching with limited/no access possibilities for the filter
2. Create a **Filter editable** button
3. Grant corresponding access rights for the button, for users and user groups

In Runtime, the filters can only be edited as stipulated in the screen switching. However the users authorized for the button can edit all configurable filters.



17.7 HTML

Makes it possible to display a screen in HTML. The Microsoft Web Browser Control currently installed on the computer is used as the rendering engine.

17.7.1 Creating a screen of the type HTML

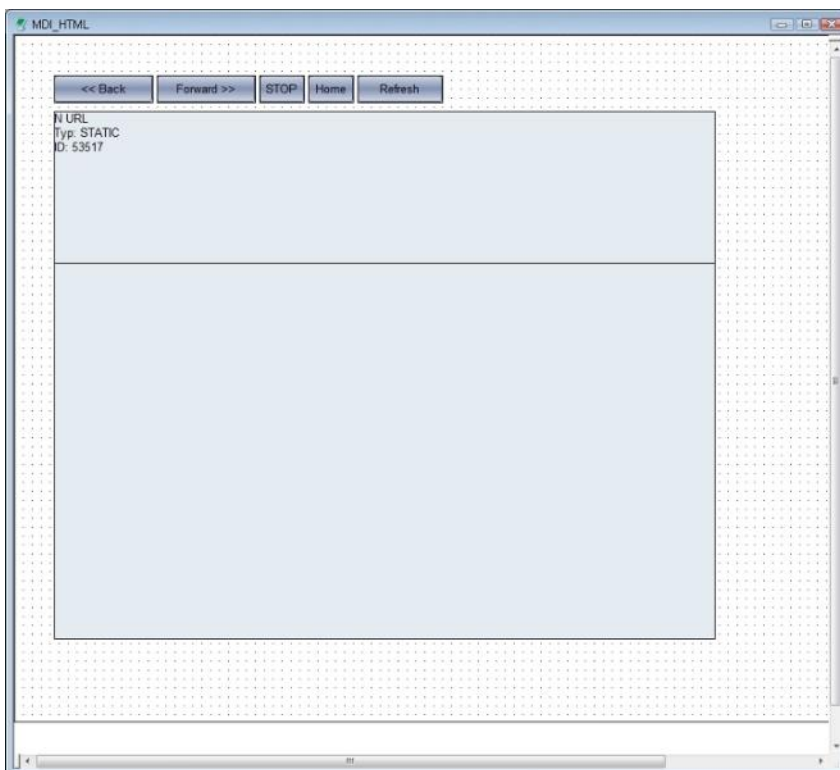
In order to create screen HTML:

1. create a new screen

2. select HTML as screen type
3. an empty screen is created
4. Click on **Add template** (on page 331) in the drop-down list
5. The dialog for selecting a template is opened
6. select the desired template
7. Add further desired control elements as required.

Addresses for the navigation and the search are defined when function Screen switch (on page 444) is created.

HTML SCREEN



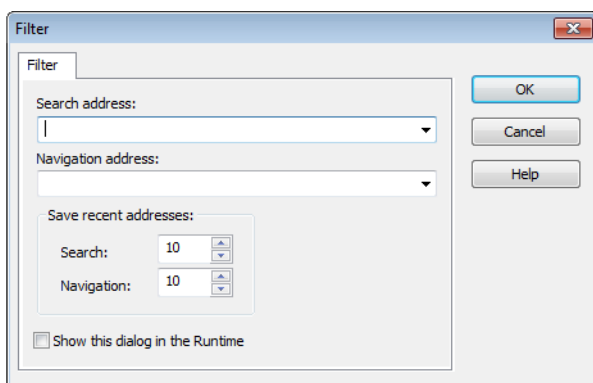
Control element	Description
Insert template	<p>Opens the dialog for selecting a template (on page 331) for the screen type.</p> <p>Templates are shipped together with zenon and can also be created by the user.</p>

	<p>Templates add pre-defined control elements to pre-defined locations in the screen. Elements that are not necessary can also be removed individually once they have been created. Additional elements are selected from the drop-down list and placed in the screen. Elements can be moved in the screen and placed individually.</p>
Browser	Control elements for the browser.
Browser window	The browser is displayed.
Address field	Field for entry of the address (URL).
Start page	The start page is called up.
Forward	Go forward.
Back	Go back.
Refresh	Refresh display.
Stop	Stop navigation.
Search	<p>Control elements for the search.</p> <p>When clicking a link in the Search field, the corresponding page is shown in the browser. So e.g. in the field search a navigation bar or the results of a search engine can be displayed without changing the contents, when a link is activated.</p>
Search	Display of the search.
Search field	Search for address or file.
Start page	Back to home in the search area.
Forward	Page down in the search area.
Back	Page up in the search area.
Refresh	Refresh display in search area.
Stop	Cancel search action.
Filter	Open filterbox.

17.7.2 Function Screen switch - HTML

In order to create a function to switch to the screen HTML:

- ▶ select New Function
- ▶ select screen switch
- ▶ select the screen HTML (on page 441)
- ▶ a dialog for defining the addresses for the search and navigation area is opened



Parameters	Description
Search address	Address of the page, that should be displayed in the search area.
Navigate address	Address of the page, that should be displayed in the navigate area.
Save recent addresses	
Search	Number of addresses, that should be stored by the system for the search area.
Navigation	Number of addresses, that should be stored by the system for the navigate area.
Show this dialog in the Runtime	Active: Opens the dialog when the screen is opened in the Runtime.

17.8 Notepad

With the notepad you can display text files and (optionally) edit them.

17.8.1 Creating screen Notepad

The display size of the screen Notepad is taken from the frame size (on page 258). The file which is opened must be determined during the definition of the Screen switch (on page 445).

In order to create a Notepad:

1. create a new screen
2. select Notepad as screen type
3. an empty screen is created
4. Click on **Add template** (on page 331) in the drop-down list
5. The dialog for selecting a template is opened
6. select the desired template



Information

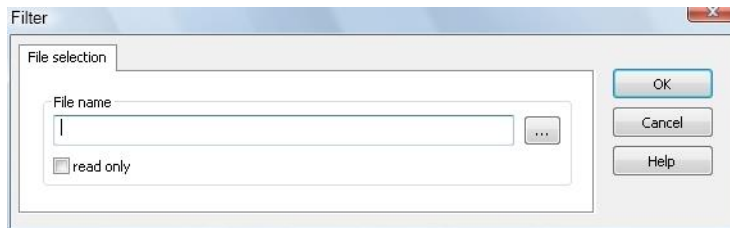
Add template adds pre-defined control elements to pre-defined locations in the screen. All control elements can be added, deleted and freely positioned. Other dynamic elements and vector elements can also be added.

17.8.2 Function screen switch to Notepad

In order to create a function to switch to the screen Notepad:

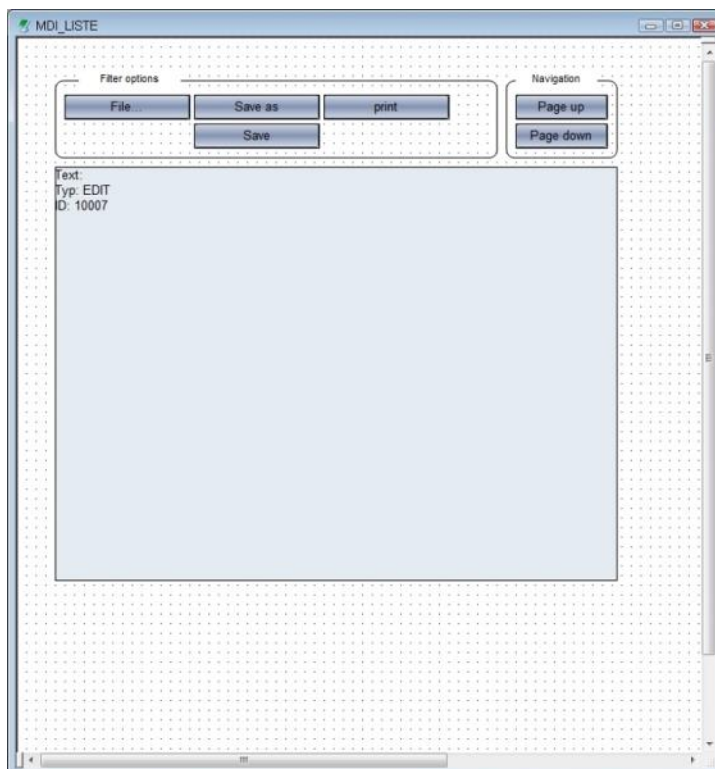
- ▶ select New Function
- ▶ select screen switch
- ▶ select the screen Notepad (on page 445)

- a dialog for defining the file which should be displayed is opened



Parameters	Description
File name	Selection of the file which is to be displayed Click on . . . button to open the selection dialog. The file must have already been created in the project manager in the File/Texts and formats node. If no appropriate file has been created, you can select on in the dialog using symbol Add file . Allowed file types: TXT, HTM, HTML, FRM.
read only	Active: In the Runtime the text can only be read but not edited.

17.8.3 Operating during Runtime



Control element	Action
Button File	File selection in online operation
Button Refresh	Refresh display in online operation
Button save	Save changes in online operation to file
Button save as	Save changes to a file with a different name
Button Print	Print report in online operation
Button print dialog	Printer settings
Button Close	Close alarm information list
Button Line right	Scroll text in list element to the right
Button Line left	Scroll text in list element to the left
Button Page right	Scroll text in list element to the right
Button Page left	Scroll text in list element to the left
Button Line up	Scroll text in list element up
Button Line down	Scroll text in list element down
Button Page up	Scroll text in list element up
Button Page down	Scroll text in list element down
Edit	Display window of the text list

17.9 Video

Video recordings - online and from saved data - can be shown in zenon with the use of a screen for video display and video recording. The format used is **.avi**.

Videos are played back in Runtime in the center of the assigned frame. They are controlled using control elements.

Note: The codec required to play back videos must be installed on the computer.



Information

The control of videos integrated into notebooks via the manufacturer's driver does not always work properly with zenon. In this case:

- ▶ Install a camera from a third-party provider
- ▶ Then select the integrated camera as a source

17.9.1 Creating a screen of the type Video

In order to create screen Video:

1. create a new screen
2. select Video as screen type
3. an empty screen is created
4. Click on **Add template** (on page 331) in the drop-down list
5. The dialog for selecting a template is opened
6. select the desired template



Information

***Add template** adds pre-defined control elements to pre-defined locations in the screen. All control elements can be added, deleted and freely positioned. Other dynamic elements and vector elements can also be added.*

17.9.2 Screen switch - video

With screen **Video** you can display two types of videos in the Runtime:

1. saved videos (*.avi)

2. Videos of a surveillance camera

Which video is shown depends on which tab was shown when you saved the dialog.



Information

If video files and online video should be displayed, create to screen switch functions.

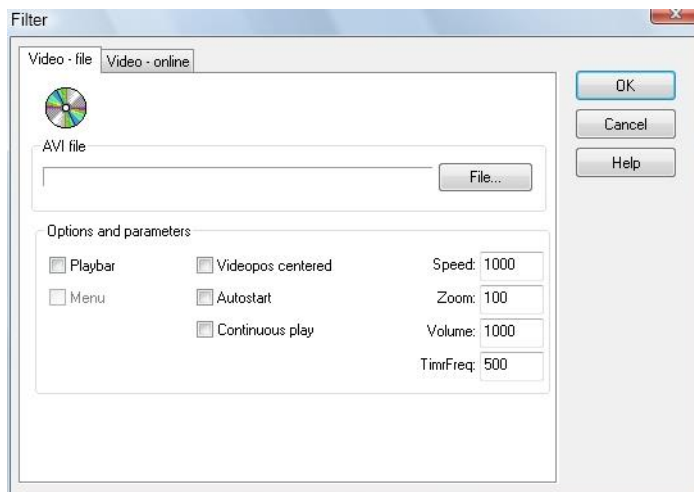
In order to create a function to switch to the screen Video:

- ▶ select New Function
- ▶ select screen switch
- ▶ select the screen Video (on page 448)
- ▶ a dialog for the definition of the video source opens.
 - Video file (on page 449)
 - Video online (on page 450)

Video file

The parameters needed for the display of screen `video` for showing a surveillance camera are the following:

- ▶ Set the video which should be shown
- ▶ Settings for position, speed, volume and zoom factor of the display



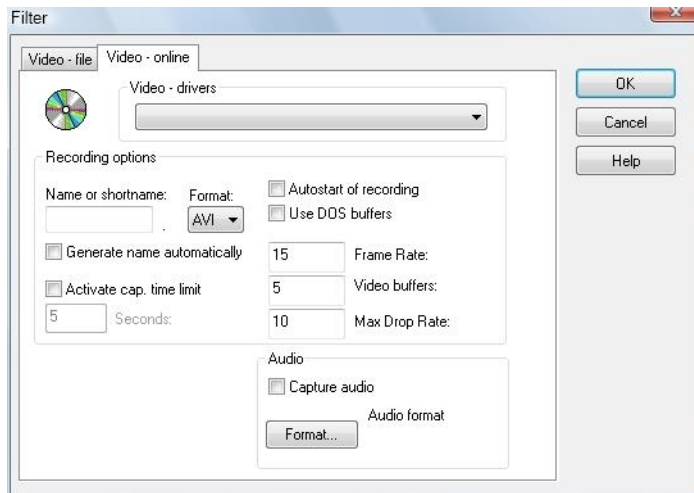
Parameters	Description
AVI file	Saved video file to be displayed
Options and parameters	
Playbar	Display of a slider in the video screen.
Menu	Display of a menu in the playbar for operating the video (only possible with activated playbar)
Videopos centered	Reference point for the position of the video display in zooming actions. Active: The zoomed video is placed in the center of the frame. Inactive: The video display is zoomed to bottom right.
Autostart	Video file is automatically started when opening the screen
Continuous play	Video file is restarted after each end.
Speed	Playback speed in thousandths of the original speed. Default: 1000 (original speed)
Zoom	Zoom factor for correctly-proportioned zooming in or zooming out as a percentage of the original size. Default: 100 (original size)
Volume	Volume in thousandths of the original volume. Default: 1000 (original volume)
TimrFreq	Note: are not currently used. Timer Frequency. Default: 500

Video online

The parameters needed for the display of screen `Video` for showing a surveillance camera are the following:

- Setting of the video driver

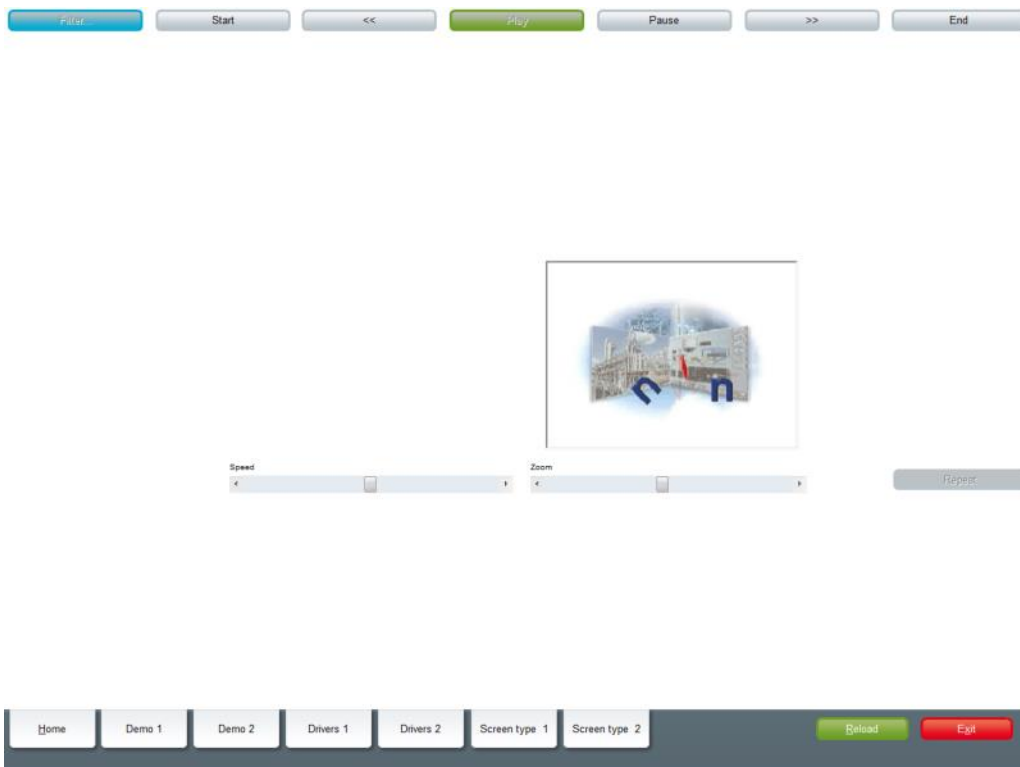
- Setting of the recording options if the video should be recorded



Parameters	Description
Video - drivers	Selection of the video driver used. Note: the driver should support Microsoft Capturing.
Recording options	Options for the recording and saving of the video as an AVI-file or Bitmaps. If only online video should be displayed, there are no settings needed.
Name or abbreviation	Name of the file to be saved.
Generate name automatically	Name is automatically generated from the system time during recording.
Activate cap. Time limit	Time limit for the recording in seconds.
Format	AVI or BMP.
Autostart of recording	Recording is automatically started when the screen is displayed.
Use DOS buffers	Only relevant for 16-bit systems.
Frame Rate	Number of pictures per second for recording
Video buffers	Reserved buffer for video recording in MB
Max Drop Rate	Maximum amount of "drooped frames" in percent during recording. Value: 0 to 100 Default: 10
Video	Driver specific settings.
<u>Views ...</u>	Setting depends on the selected driver.
<u>Format ...</u>	Setting depends on the selected driver.
<u>Compress ...</u>	Setting depends on the selected driver.
<u>Source ...</u>	Setting depends on the selected driver.
Audio	Settings for the sound recording
Capture audio	Activates the sound recording.
Audio format	Driver specific settings.

17.9.3 Operating during Runtime

Videos are displayed as centered in the frame.



Control element	Description
Insert template	<p>Opens the dialog for selecting a template (on page 331) for the screen type.</p> <p>Templates are shipped together with zenon and can also be created by the user.</p> <p>Templates add pre-defined control elements to pre-defined locations in the screen. Elements that are not necessary can also be removed individually once they have been created. Additional elements are selected from the drop-down list and placed in the screen. Elements can be moved in the screen and placed individually.</p>
Filter	Filter settings.
Control	Control elements to control the videos.
Play	Play video.
Stop	Stop playback/resume playback.
Recording	Record video.
Pause	Stop video during playback.

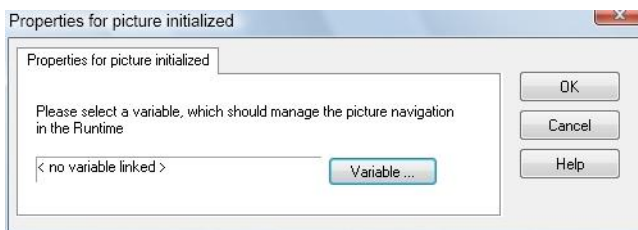
Video online	Elements for controlling an online video.
Format	Output format.
Source	Data source.
Display	Display Video.
Compression	Data compression.
Video file	Elements for controlling a video file.
Magnify	Enlargement of the section.
Speed	Speed.
Fast-forward	Fast forward.
Rewind	Fast reverse.
Eject	Eject.

18. Screen Functions

When the standard function is created from the context menu in the detail view, <CD_PRODUCTNAME> creates a function `screen switch` (on page 461) for the selected screen. Other functions can be configured using the **Functions** node and the **New function** command.

18.1 Screen with index

This function is used to switch to the screen with the name stated in the linked string variable.



A string variable is to be selected from the list of variables as a transfer parameter.

Note for multiple-monitor systems: It is not possible to select monitors. The function always relates to the first monitor.

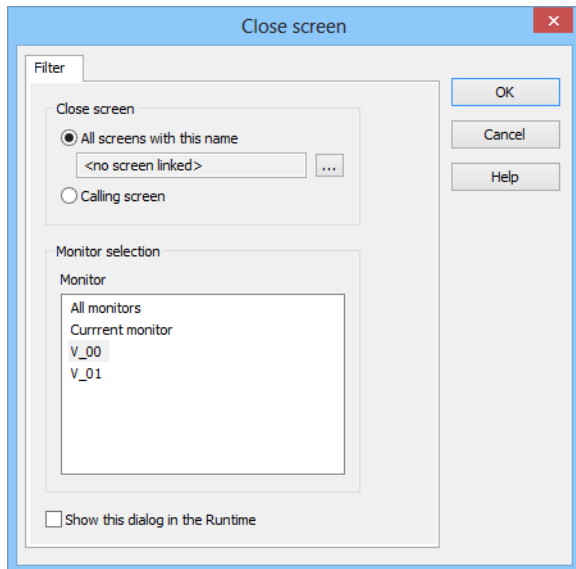
18.2 Screen : close

A defined screen in Runtime is closed with this screen. If, with a multiple-monitor projects, a screen is switched to several monitors, it is possible to select which screen is closed on which monitor.

To configure the function:

1. Select, in the list of functions, in the **Screens** node, the `Close screen` function
2. select the desired picture
3. Select, with multiple-monitor projects, the virtual monitor on which the screen is to be closed from list:
 - All

- Current monitor
- Designated virtual monitor



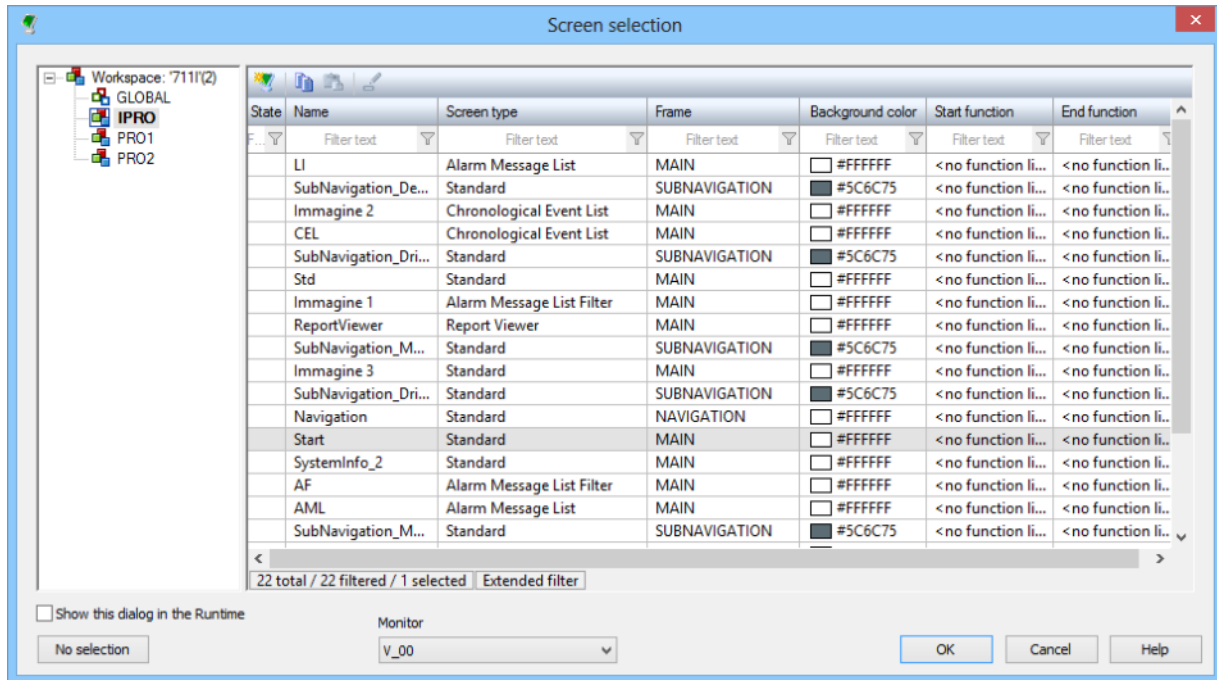
Parameters	Description
Close screen	Configuration of which screens are closed when the function is called up.
All screens with the name	<p>All opened screens with the selected name are closed.</p> <p>Click the ... button and a dialog opens to select a screen. For further details, see the screen selection dialog section.</p>
Calling screen	<p>The calling screen is closed.</p> <p>This also happens if several screens with the same name are opened; only the screen from which the call comes is closed. With this option selected, the monitor selection cannot be configured manually.</p> <p>Recommendation: Suitable for closing pop-ups.</p>
Monitor selection	Configuration of the monitor for which the closing of the screen is to be configured.
Monitor	<p>Selection of the monitor from the list.</p> <ul style="list-style-type: none"> ▶ All monitors ▶ Current monitor ▶ Selection of a virtual monitor (Note: the real monitors are displayed hen called up in Runtime.) <p>Only available for multi-monitor systems and only for the All screens with the name option.</p>
Show this dialog in the Runtime	Active: This dialog is opened in Runtime before the function is executed.
OK	Applies settings and closes the dialog.
Cancel	Discards all changes and closes the dialog.
Help	Opens online help.

SCREEN SELECTION DIALOG

In the screens selection dialog, screens can be selected for the execution of functions from:

- ▶ Current project
- ▶ Subprojects

- All projects in the workspace with the **Keep project in memory** option active



Parameters	Description
Project tree window	Displays all projects in the workspace. Screens can be selected from the current project and from all projects with the Keep project in memory option active
Screens window	Selection of the screen. If several screens are selected, the screen at the top of the list is used for the execution of the function.
No selection	Removes selection and closes dialog.
OK	Applies settings and closes the dialog.
Cancel	Discards all changes and closes the dialog.
Help	Opens online help.

18.3 Screen: Return to last

With this function, it is possible to switch to the screen of a template previously called up and since closed during online operation. These screens that were previously open are administered in a buffer

after they have been closed. When opened again, the same function that is used to to open the screen is executed once again. This means that screen filters are not saved but have to be recreated.

By executing the `Screen switching` function, the screens of the corresponding frames (on page 258) are stored in the memory. The number of screens in the memory is configured in the `project.ini` file:

```
[FUNKTIONEN]
```

```
ZURUECK_ANZAHL=10
```

The frames have to be given as a transfer parameter.

The amount of memory must be given with the `ZURUECK_ANZAHL=` entry.

Note for multiple-monitor systems: It is not possible to select monitors. The function always relates to all monitors.



Information

A screen is only entered into the previous screen list if it is closed. Templates that are open in the background are not considered closed screens however. If screens are switched in several templates above one another, then the previous screen list remains empty because all screens are still open.

Hint: In general, never place the templates directly above one another.

18.4 Screen: Move center

With this function, the screen center can be moved or the zoom factor can be changed in worldview function.

Requirements:

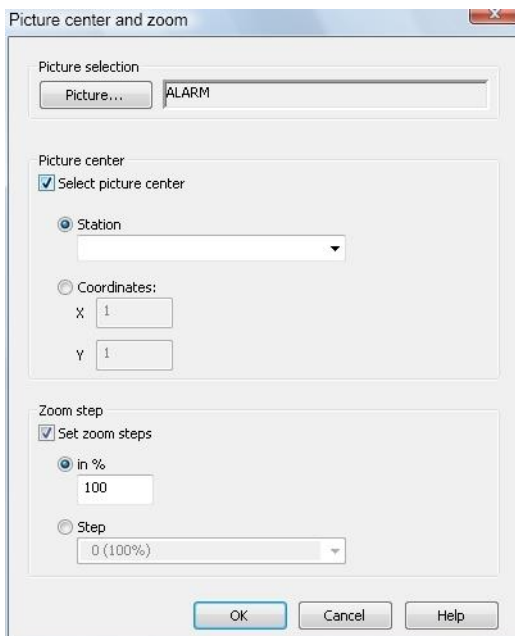
- ▶ The screen must be larger than the monitor resolution
- ▶ In the screen properties, the `Size from frame` must be deactivated in the `Size` group
- ▶ The size must be defined using the `Width [pixels]` and `Height [pixels]` properties



Information

This function is not available under Windows CE.

SCREEN CENTER AND ZOOM DIALOG



Picture center and zoom

Picture selection

Picture... ALARM

Picture center

☒ Select picture center

☒ Station

☐ Coordinates:

X 1

Y 1

Zoom step

☒ Set zoom steps

☒ in %

100

☐ Step

0 (100%)

OK Cancel Help

Parameters	Description
Screen	Selection of the screen for the new center Clicking on the button opens the dialog to select the screen.
Select screen center	Settings for the screen center
Object name	Set desired center of the screen via an object from the object list
Coordinates	Enter desired screen center in coordinates (x,y)
Set zoom steps	Settings for the zoom factor.
in %	Set desired zoom factor in percent.
Step	Set desired zoom factor via the defined zoom steps.
OK	Applies settings and closes the dialog.
Cancel	Discards all changes and closes the dialog.
Help	Applies settings and closes the dialog.

Note: If the Worldview is called up several times, this function is only applied to the last screen called up.

18.5 Screen switch

The **screen switch** function makes it possible to switch between process screens in runtime



Example

*In a project, there is a **Start** screen and a screen of type **Alarm Message List**. During runtime, it should be possible to switch between these two screens. So, for example, a button is created in the **Start** screen and a function of type **screen switching** in the **Alarm Information List** screen. After this, the function is linked to the button, for example by dragging & dropping. Now during runtime, the **Start** screen can be left by pressing the button and the **Alarm Message List** can be switched on.*

CONFIGURE SCREEN SWITCHING

To configure the function:

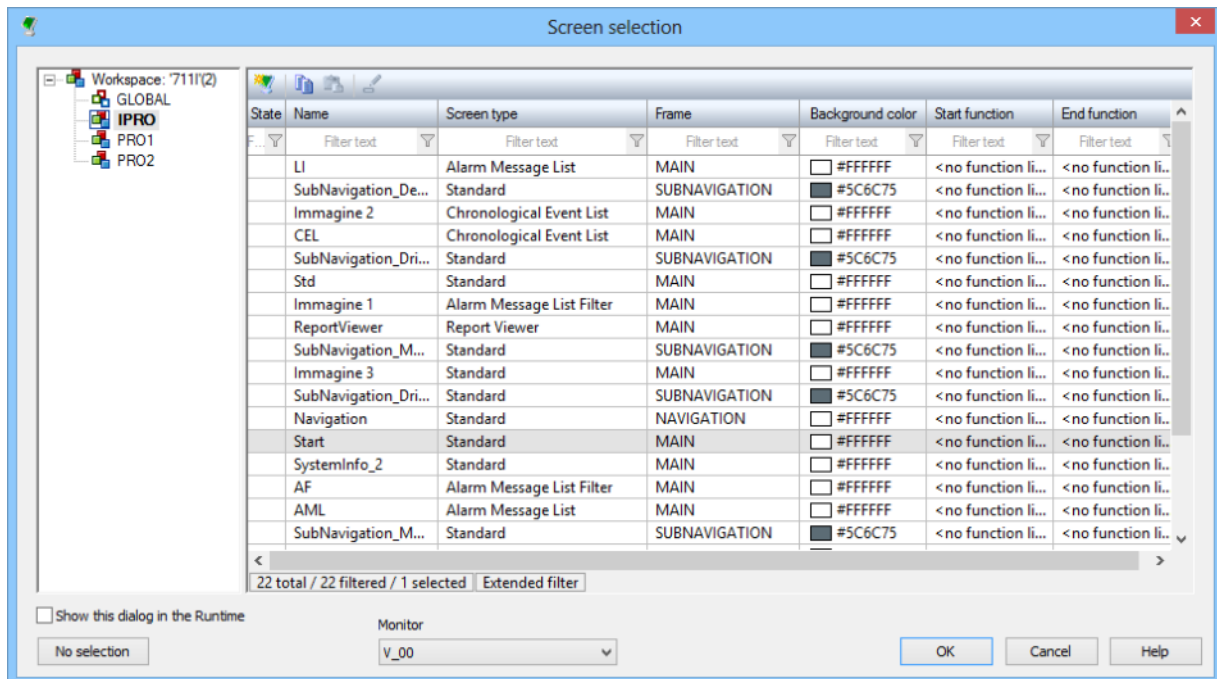
1. create a new function
2. navigate to node `Screens`
3. Select the `Screen switch` function
4. The dialog for selecting a screen is opened
5. Select a screen
6. The dialog to replace variables and functions (on page 240) is opened
7. Close the dialog by clicking on OK
8. Allocate a button to the function

SCREEN SELECTION DIALOG

In the screens selection dialog, screens can be selected for the execution of functions from:

- ▶ Current project
- ▶ Subprojects

- All projects in the workspace with the **Keep project in memory** option active



Parameters	Description
Project tree window	Displays all projects in the workspace. Screens can be selected from the current project and from all projects with the Keep project in memory option active
Screens window	Selection of the screen. If several screens are selected, the screen at the top of the list is used for the execution of the function.
No selection	Removes selection and closes dialog.
OK	Applies settings and closes the dialog.
Cancel	Discards all changes and closes the dialog.
Help	Opens online help.

18.6 Activate input to the element with the focus

This function activates the element that is being focused on in the frame selected.

18.7 Set focus to frame

This function sets the focus to a defined frame when operating the keys in Runtime.

To configure the function:

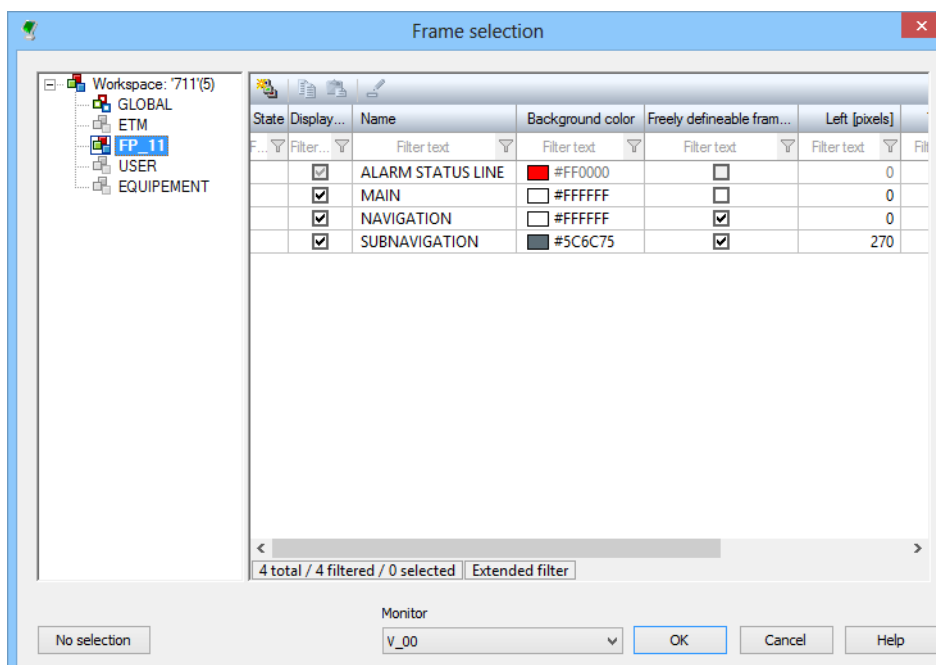
1. Select, in the list of functions, in the **Screens** node, the **Set focus to frame** function
2. The dialog for selecting a screen is opened
3. select the frame you wish to assign
4. For multi-monitor projects, select the virtual monitor for opening the frame

The frame with a focus is displayed with a frame in runtime. The line width and color of the frame are defined in the **Graphical design/Screens** node in project properties.

FRAME SELECTION DIALOG

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

- Current project
- Subprojects
- All projects in the workspace with the **Keep project in memory** option active



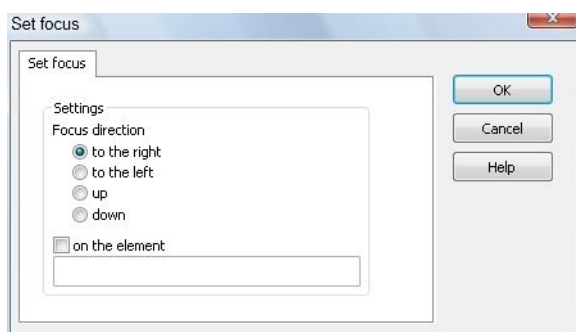
Parameters	Description
Project tree window	Displays all projects in the workspace. Frames can be selected from the current project and from all projects with the Keep project in memory option active
Frames window	Selection of a frame. If several frames are selected, the frame at the top of the list is used to execute the function.
No selection	Removes selection and closes dialog.
OK	Applies settings and closes the dialog.
Cancel	Discards all changes and closes the dialog.
Help	Opens online help.

Set focus on frame with multiple frames called up

If a frame is displayed on a monitor several times (on page 269), then the focus is switched in the reverse of the switching sequence each time the functions of the focus are executed. If, for example, with a frame that is called up several times, the screens **Screen1**, **Screen2** and **Screen3** are open and then the focus is set to this frame, the focus goes to the last screen opened, **Screen3**. When the **set focus to frame** function is called up again, the focus is set to **Screen2** etc.

18.8 Move focus

This function set the focus on a particular element in runtime with keyboard operation and can therefore be used to navigate within a frame.



Property	Action
Direction	Define the direction in which the focus should be moved. The following defined sequence applies in the editor in the context menu or under <i>Edit/change focus sequence</i> . . .
on the element	Definition of the element for the focus. Enter the object name of the element.

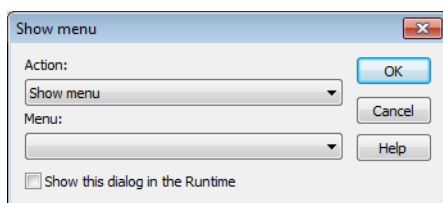
18.9 Take focus away from frame

This function takes the focus from the current frame in runtime. To continue operating the keyboard, the focus must be set to a frame again.

18.10 Show menu

This function controls the display of main menus.

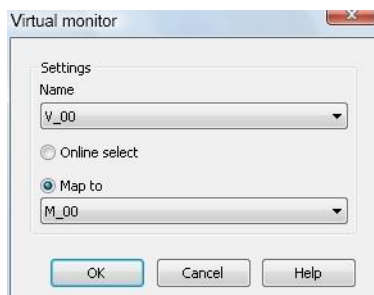
1. Create a new function with **New function**
2. In the **screens** node, select the **Display menu** function
3. Define the action to be carried out and the main menu



Parameters	Description
Action	Selection of the action:
Show menu	The selected menu is displayed.
Hide menu	The selected menu is hidden.
Change menu	The current menu is hidden and the selected menu is displayed instead.
If no menu exists	The selected menu is displayed, if no menu is displayed at the moment.
Menu	Selection of menu.
Show this dialog in the Runtime	Active: This dialog is opened when the function is carried out in Runtime.

18.11 Monitor assign

In a multi-monitor-environment you can assign a certain virtual monitor to a single real monitor.



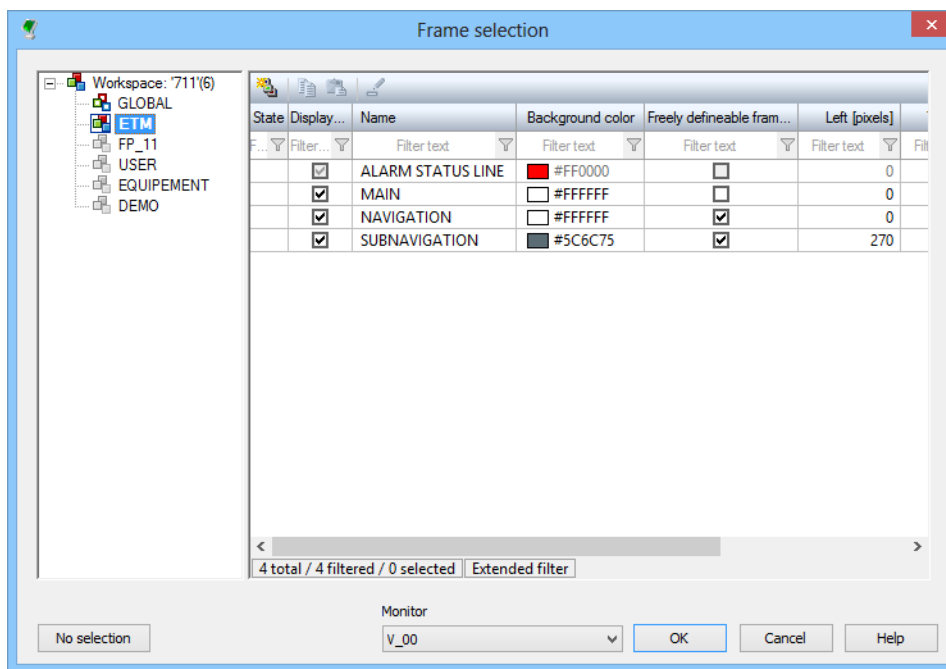
18.12 Move frame to the foreground

With this function, screens that are covered by other screens in Runtime can be moved to the foreground. A frame is selected - and a monitor assignment if multiple monitors have been configured. In Runtime, when executed, all instances of the defined frame are moved to the foreground of the selected monitor. This function is mainly useful for screens and frames that are called up with a title bar.

To configure the function:

1. in the context menu of the **function** node, select **New function**
2. Open the **Screens** node in the selection dialog.
3. Select the **Move frame to foreground function**.
4. The dialog for selecting a frame is opened
5. Highlight the desired frame and confirm them by clicking **OK**
6. Link the function to a button.

SELECTION DIALOG FOR FRAME



Parameters	Description
Project tree window	Displays all projects in the workspace. Frames can be selected from the current project and from all projects with the Keep project in memory option active.
Frames window	Selection of a frame. If several frames are selected, the frame at the top of the list is used to execute the function.
No selection	Removes selection and closes dialog.
Monitor	For multi-monitor systems, the selection of the monitor for which this function is configured from a drop-down list: <ul style="list-style-type: none"> ▶ All monitors ▶ Current monitor ▶ Designated virtual monitor
OK	Applies settings and closes the dialog.
Cancel	Discards all changes and closes the dialog.
Help	Opens online help.

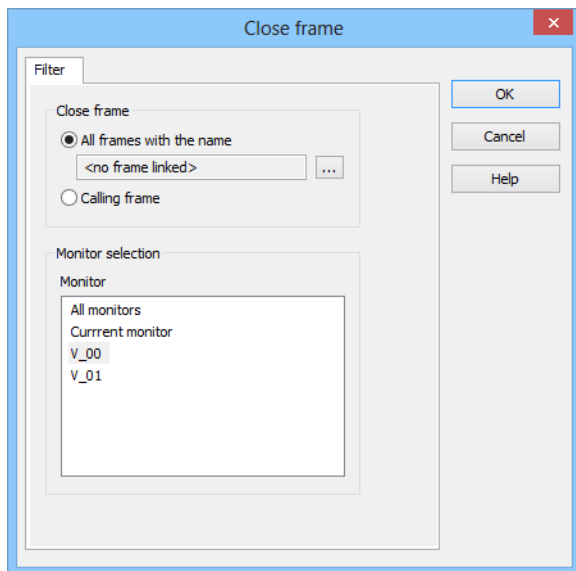
18.13 Close frame

With this function, the selected frame (on page 258) with all screens that are based on it are closed. In contrast to the Close screen (on page 455) function, the precise screen name need not to be given in this case. If, with a multiple-monitor projects, a frame is switched to several monitors, it is possible to select which frame is closed on which monitor.

To configure the function:

1. Select, in the list of functions, in the **Screens** node, the **Close frame** function
2. select the frame you wish to assign
3. Select, with multiple-monitor projects, the virtual monitor on which the frame is to be closed, from the drop-down list:
 - All

- Current monitor
- Designated virtual monitor



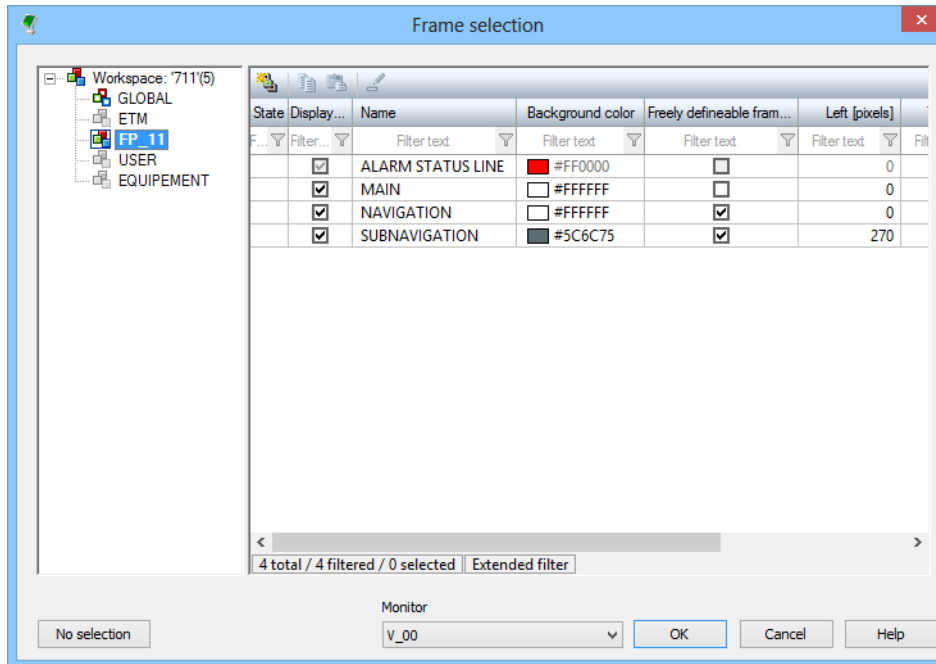
Parameters	Description
Close frame	Configuration of which frames are closed when the function is called up.
All frames with the name	All opened frames with the selected name are closed. Click on the ... button to open the dialog to select a frame. For details, see the Frame selection dialog (on page 471) section.
Calling frame	The calling frame is closed. This also happens if several frames with the same name are opened; only the frame from which the call comes is closed. With this option selected, the monitor selection cannot be configured manually.
Monitor selection	Configuration of the monitor for which the closing of the frame is to be configured.
Monitor	Selection of the monitor from the list. <ul style="list-style-type: none"> ▶ All monitors ▶ Current monitor ▶ Selection of a virtual monitor (Note: the real monitors are displayed when called up in Runtime.) Only available for multi-monitor systems and only for the All frames with the name option.
Show this dialog in the Runtime	Active: This dialog is opened in Runtime before the function is executed.
OK	Applies settings and closes the dialog.
Cancel	Discards all changes and closes the dialog.
Help	Opens online help.

18.13.1 Frame selection dialog

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

- ▶ Current project
- ▶ Subprojects

- All projects in the workspace with the **Keep project in memory** option active

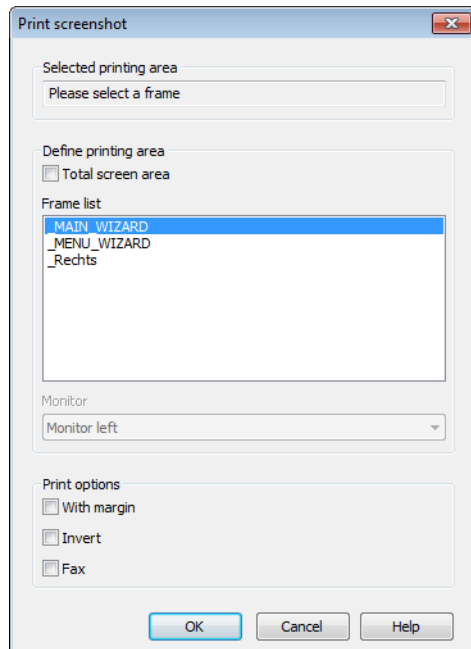


Parameters	Description
Project tree window	Displays all projects in the workspace. Frames can be selected from the current project and from all projects with the Keep project in memory option active
Frames window	Selection of a frame. If several frames are selected, the frame at the top of the list is used to execute the function.
No selection	Removes selection and closes dialog.
OK	Applies settings and closes the dialog.
Cancel	Discards all changes and closes the dialog.
Help	Opens online help.

18.14 Print screenshot

This function is used to make a screenshot of the entire screen or of frames (process screens, lists, trend curves, etc.) in the Runtime. Frames are selected with a doubleclick.

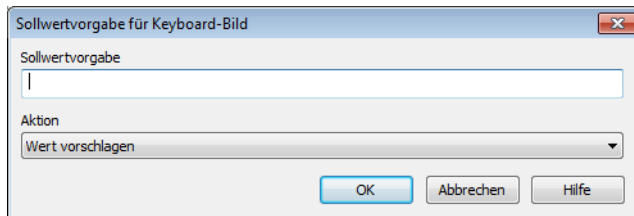
Give the frame and the additional options as the transfer parameters. This function is configured via the following dialog.



Property	Description
Selected print area	Display of the selected area.
Define print area	Selection of the area which should be printed.
Total screen area	Prints screenshot of the whole screen. For multi-monitor systems the contents of the standard monitor is printed.
Frames list	<p>Only available if the <code>Total screen area</code> property is inactive.</p> <p>Select the desired frame via double click. It is displayed in field Selected print area.</p> <p>Note: If the selected frame is not active during Runtime, nothing is printed.</p>
Monitor	<p>Only available if a frame has been selected and the <code>Total screen area</code> property is inactive.</p> <p>Select the desired monitor from the drop-down list:</p> <ul style="list-style-type: none"> • All • Current monitor • Designated virtual monitor <p>Note: If you have selected a frame which covers more than one screen , you must select <code>current monitor</code> in order to print the whole frame.</p>
Print options	
With margin	At printing a margin is left for tacking.
Inverted	Reverses bright/dark areas.
Fax	The hardcopy is rerouted to the fax. For this you must select a fax device as printer for screenshots in the Printer settings.

18.15 Set point input for screen keyboard

The Setpoint input for keyboard screen function is not available for the keyboard screen. In addition the text field `Set value` must have been created. It makes it possible to set or set and send a previously defined value.



Parameters	Description
Set point default	Input of the target value.
Action	Selection of action from drop-down list. (for possible actions, see the following table.)
OK	Accepts inputs, closes dialog and creates functions with value and action.
Cancel	Discards inputs, closes dialog and creates functions without setpoint and action.
Help	Opens online help.

Actions in the drop-down list:

Action	Description
propose value	The setpoint default is written to the keyboard screen.
Accept value	<p>The following happens:</p> <ul style="list-style-type: none"> ▶ the set value default is written to the keyboard screen ▶ The keyboard screen is closed with OK
RGM: Accept and send value	<p>If the keyboard screen is called up from the Recipe Group Manger recipe table, then:</p> <ul style="list-style-type: none"> ▶ The setpoint default is written to the keyboard screen ▶ The keyboard screen is closed with OK ▶ The recipe value is written to the variable
RGM: Accept value and save recipe	<p>If the keyboard screen is called up from the Recipe Group Manger recipe table, then:</p> <ul style="list-style-type: none"> ▶ The setpoint default is written to the keyboard screen ▶ The keyboard screen is closed with OK ▶ The recipe is saved
RGM: Write and send value and save recipe	<p>If the keyboard screen is called up from the Recipe Group Manger recipe table, then:</p> <ul style="list-style-type: none"> ▶ The setpoint default is written to the keyboard screen ▶ The keyboard screen is closed with OK ▶ The recipe value is written to the variable ▶ The recipe is saved

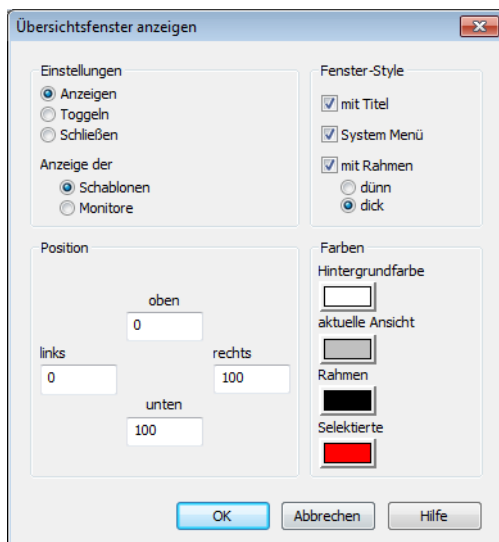
18.16 Show overview window

The `Show overview window` function displays the overview window in Runtime, which shows the real monitors or frames in a multi-monitor system. A monitor and/or a frame can be activated by means of a mouse click.

To configure the function:

1. Create a new function
2. Navigate to the node
3. Select the `Show overview window` function
4. the dialog for configuring the overview window is opened
5. Select your configuration
6. Close the dialog by clicking on OK
7. Allocate a button to the function

DISPLAYING THE OVERVIEW WINDOW



Parameters	Description
Options	The function can either open, close or toggle the overview window. Selection is carried out by means of radio buttons:
Display	The overview window is opened.
Toggle	The display is switched between open and closed.
Close	The overview window is closed.
Display of	Selection of display in the overview window. Either frames or monitors are displayed.
Frames	The overview window divides the screen into frames.
Monitors	The overview window divides the screen into monitors.
Position	Position of the overview window on the screen, calculated in pixels from the upper left edge.
Window style	
With title	Active: The overview window has a Windows title bar.
System menu	Active: A system menu is displayed if the title bar is activated.
With frame	Active: Overview window is displayed with a border. The window size can be adjusted in Runtime by dragging the border. Selection of the border width by means of radio buttons:
Fine	Bold border.
Bold	Fine border.
Colors	Definition of the colors in the overview screen. Clicking on Color opens the palette.
Background color	Color of window background
Current view	Currently displayed frames/monitors.
Frame	Color of border.
Selected	Selected frames/monitors.
OK	Accepts settings, closes dialog and creates functions with assignment.
Cancel	Discards settings, closes dialog and creates functions with standard settings.
Help	Opens online help.

