zenon
by COPA-DATA

zenon manual

Standard recipes

v.8.20

Contents

1 Welcome to COPA-DATA help

ZENON VIDEO TUTORIALS

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

GENERAL HELP

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

PROJECT SUPPORT

You can receive support for any real project you may have from our customer service team, which you can contact via email at 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.

2 Standard Recipes

Recipes collect set values and commands in a list that are executed in the Runtime by means of a function.

Recipes can be engineered either in the Editor or in the Runtime (with the help of screen **Recipe standard**).

A collection of several recipes is created and administrated with the help of the Recipegroup Manager.

PROJECT MANAGER CONTEXT MENU

Menu item	Action
Editor profile	Opens the drop-down list with predefined editor profiles.
Help	Opens online help.

3 Engineering in the Editor

3.1 Project manager context menu

Menu item	Action
New Recipe	Creates a new recipe in the list and opens the name for editing.
Export all as XML	Exports all entries as an XML file.
Import XML	Imports from an XML file.
Import ASCII	Imports from an ASCII file.
Editor profile	Opens the drop-down list in which you can allocate an Editor profile.
Help	Opens online help.

3.2 Context menu detail view

TOOLBAR

Menu item	Action
New Recipe	Creates a new recipe in the list and opens the name for editing.
Create standard function	Opens the dialog for selecting a recipe and an action and creates a suitable function. The action is documented in the output window.

Menu item	Action
Add variable	Opens the dialog for selecting variables.
Jump back to starting element	Jumps back to the initial position in the zenon Editor. **Note:** Only available in the context menu if a jump to the current position has been made from another position with the **Linked elements** context menu entry.
Copy	Copies the selected entries to the clipboard.
Paste	Pastes the content from the clipboard. If an entry with the same name already exists, the content is pasted as "Copy of".
Delete	Deletes selected entries.
Move up	Moves the entry up one place in the recipe list.
Move down	Moves the entry down one place in the recipe list.
Change set value	Activates cell **Set value** in order to insert a value.
Export selected as XML...	Exports selected entries as an XML file.
Import XML	Imports from an XML file.
Export selected as ASCII	Exports selected entries as an ASCII file.
Import ASCII	Imports from an ASCII file.
Rename	Makes it possible to rename the selected recipe. Also possible by clicking in the field with the mouse or by pressing the **F2** key.
Properties	Opens the property window.
Help	Opens online help.

CONTEXT MENU TREE IN DETAIL VIEW

Menu item	Action
Add variable	Opens the dialog for selecting variables.
New Recipe	Creates a new recipe in the list and opens the name for editing.
Create standard function	Opens the dialog for selecting a recipe and for the definition of the desired action

Menu item	Action
Copy	Copies the selected entries to the clipboard.
Paste	Pastes the content from the clipboard. If an entry with the same name already exists, the content is pasted as "Copy of".
Delete	Deletes selected entries.
Export selected as XML...	Exports selected entries as an XML file.
Import XML	Imports from an XML file.
Export selected as ASCII	Exports selected entries as an ASCII file.
Import ASCII	Imports from an ASCII file.
Rename	Makes it possible to rename the selected recipe. Also possible by clicking the field with the mouse or by pressing the **F2** key.
Properties	Opens the property window.
Help	Opens online help.

CONTEXT MENU DETAILS

Menu item	Action
Add variable	Opens the dialog for selecting variables.
Remove variable	Deletes selected variable after a confirmation message.
Move up	Moves selected variable up on place.
Move down	Moves selected variable down on place.
Change set value	Opens the cell with the set value in order to change it.
Remove filter	Removes all current filter settings.
Help	Opens online help.

3.3 Create Standard Recipe screen type

The handling of the recipes in the Runtime is realized with a screen of the screen type *Standard recipe*. This screen must be created in the editor first.

CREATE SCREEN OF TYPE STANDARD RECIPE

ENGINEERING

Two procedures are available to create a screen:

- The use of the screen creation dialog
- The creation of a screen using the properties

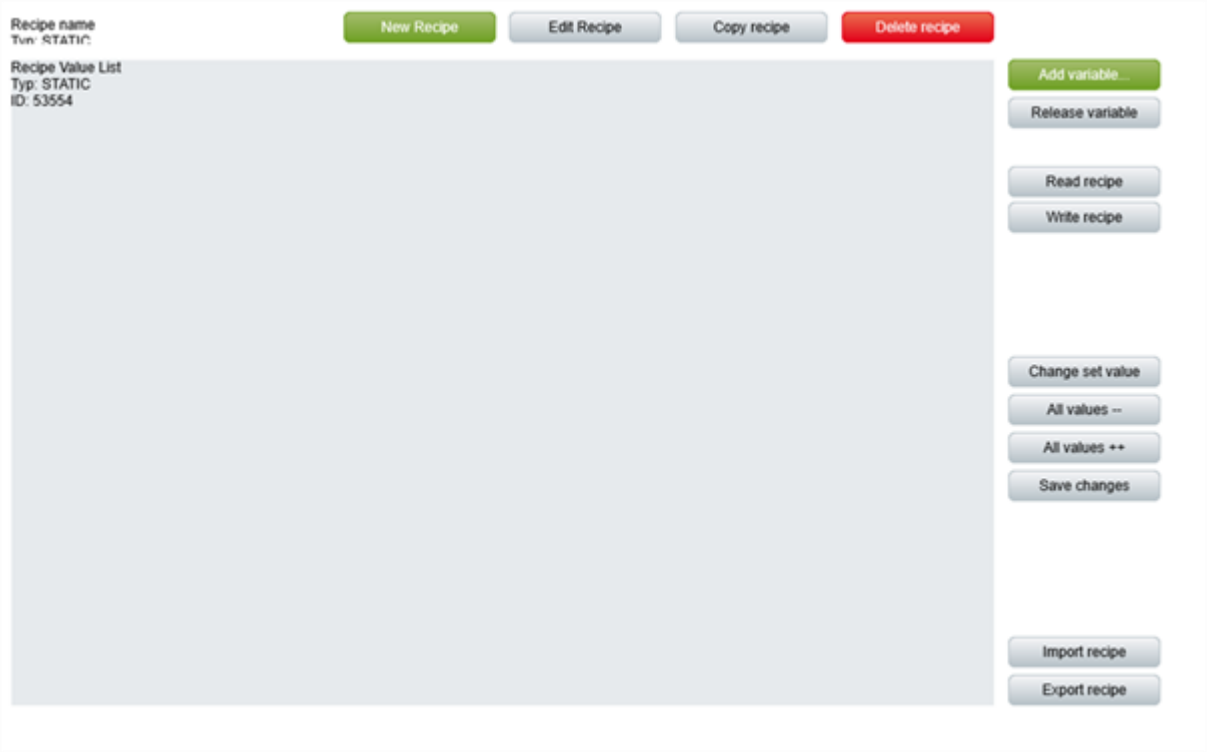
Steps to create the screen using the properties if the screen creation dialog has been deactivated in the menu bar under **Tools**, **Settings** and **Use assistant**:

1. Create a new screen.

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

2. Change the properties of the screen:
   a) Name the screen in the **Name** property.
   b) In the **Screen type** property, select *Standard Recipes*.
   c) Select the desired frame in the **Frame** property.
3. Configure the content of the screen:
   a) Select the **Elements (screen type)** menu item from the menu bar.
   b) Select *Insert template* in the drop-down list.
   The dialog to select pre-defined layouts is opened. Certain control elements are inserted into the screen at predefined positions.
   c) Remove elements that are not required from the screen.
   d) If necessary, select additional elements in the **Elements** drop-down list. Place these at the desired position in the screen.

4. Create a screen switch function.



CONTROL ELEMENTS

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

WINDOW

Window in the Runtime

Control element	Description
Recipe name	Name or selection of the current recipe

Control element	Description
Recipe window	Display of the current recipe in a table
Writing progress	Progress bar, indicating the writing of the recipe. The control element displays the progress bar from bottom to top or from left to right depending on the location and form of the element. The control element is hidden in the Runtime and is only displayed during the writing of a recipe. **Note:** The control element is only displayed if property **Write synchronously** is active.

RECIPE FUNCTIONS

Actions for recipes in the Runtime.

Control element	Description
New Recipe	Create a new recipe
Edit Recipe	Edit the current recipe.
Copy recipe	Copy current recipe.
Save recipe	Save current recipe under the same name
Delete recipe	Delete current recipe
Export recipe	Save current recipe as a TXT file.
Import recipe	Load current recipe from a TXT file.
Read values from PLC	The values of the variables of the selected recipe are read from the process and entered into the table. Changes have to be saved!
Change set value	Change the value of the selected variable in the recipe A decimal value can be entered with a colon as well as with a point, the decimal point will automatically be changed to a point. **Attention:** If this element does not exist in the screen, the recipes in the list element are displayed read-only.
All values ++	All values of the selected recipe are increased by 1
All values --	All values of the selected recipe are decreased by 1

Control element	Description
Write recipe	The values of the variables of the selected recipe are written to the process as displayed in the table.
Add variable ...	Add a variable to the selected recipe It is also possible to use variables of other loaded projects.
Remove variable	Remove the selected variable from the recipe

NAVIGATION

Buttons for navigation in the recipe.

Control element	Description
Previous recipe	Move to the previous recipe
First recipe	Move to the first recipe
Next recipe	Move to the next recipe
Last recipe	Move to the last recipe

SYNCHRONOUS WRITING:

If property **Write synchronously** is active, the control element writing progress is displayed if a recipe is written to the control until the writing confirmation arrived at the recipe module. It does not matter whether the writing confirmation is positive or negative. If you want to react to a negative writing confirmation, you can do this with the help of a reaction matrix.

Information

Buttons can be protected with password and authorization level. For details see the Operation in the Runtime (on page 19) chapter.

3.4 Create a new recipe

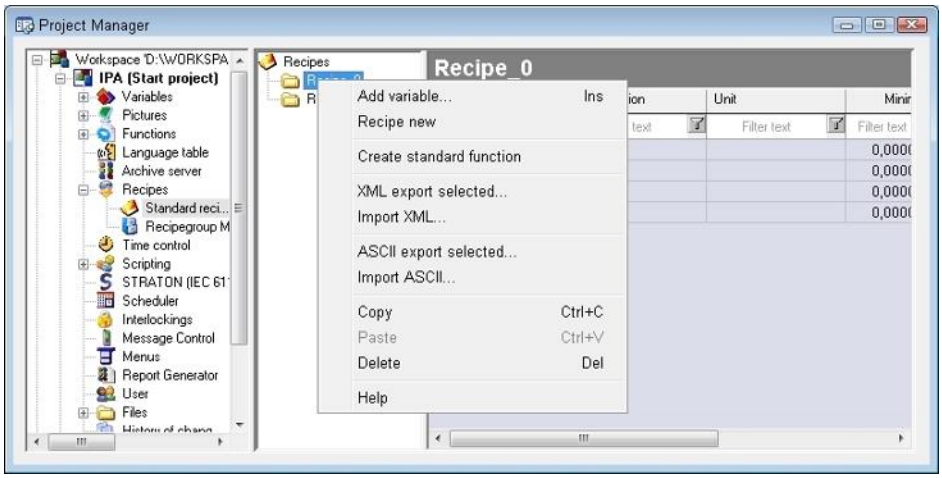
In order to create a new recipe, select **New Recipe** from the context menu of the folder **Recipes / Standard recipes** in the Project manager. The newly-created recipe is displayed in the detail view of the Project Manager. Further definitions are also realized in the Detail view.

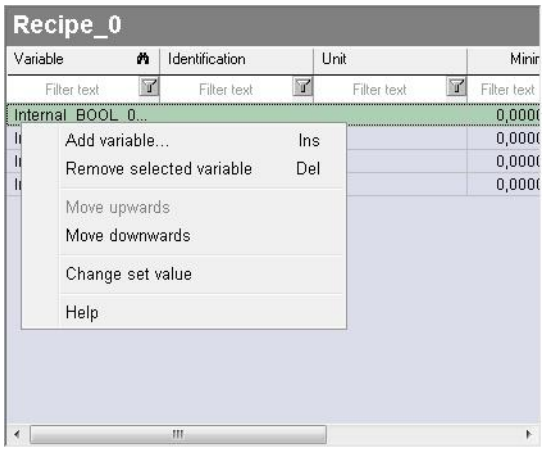
3.5 Adding variables to a recipe

After creating a new recipe (on page 11) variables can be added to the recipe.

Attention

String variable cannot be written to the PLC with a standard recipe. For string variables use the Recipegroup Manager.





Variables are selected in the dialog 'Filter: Variable selection' selected. The variables are applied either by double clicking them or by clicking button **Add**. Multi-select is possible. Varialbes from loaded sub projects can be used. All variables added to a recipe must not be read-only. If you reconfigure variables (i.e. change the norming), the set value to be written in the recipe is also amended accordingly.

Information

A decimal value can be entered with a colon as well as with a point, the decimal point will automatically be changed to a point.

SORTING VARIABLES

You can arrange variables any way you like:

Select the variable that you want to change the sequence of and choose one of the following actions:

- In the context menu, select the corresponding entry **Move up** or **Move down**
- Move the variables by dragging & dropping

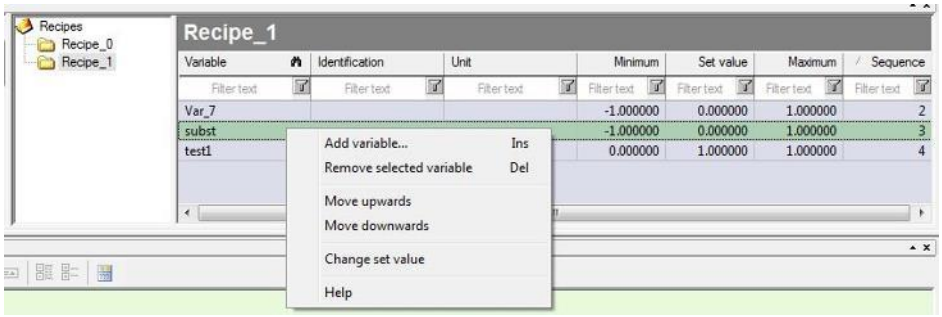
Alternatively, you can already arrange the order of the variables when linking in the variable selection dialog, with the arrow keys in the dialog.

CONTEXT MENU VARIABLE VIEW

Parameter	Description
Add variable	Opens the dialog to select variables.
Remove variable	Deletes selected variables from the list after confirming a warning message.
Move up	Moves selected variable up on place.
Move down	Moves selected variable down on place.
Change set value	Activates cell **Set value** and highlights the current set value.
Remove all filters	Removes all set filter.
Help	Opens online help.

3.6 Editing set values

In order to edit the set values of the variables you can either select **Edit set value** from the context menu or you can change it directly in the column set value. For the checking of the setpoint value the technical minimum and maximum values for each variable are displayed with it. Multi-select is avaibale for deleting variables, but not for editing variables.



The variable '_LASTRECIPE' includes the name of the last executed standard recipe.

This allows to realize a recipe administration, as this variable at any time offers information, which recipe is active at the moment.

The variable '_LASTNEWRECIPE' includes the name of the last created standard recipe.

The variables "_LASTRECIPE" and "_LASTNEWRECIPE" can be based on any driver and must be writeable.

Attention

Exceptions:

The Variable "_LASTRECIPE" cannot be realized with the Standard System Driver.

The Variable "_LASTRECIPE" cannot be realized with the Standard System Driver.

3.6.1 Check write set value

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

- **WR-ACK**

  The driver received a value for writing.

- **WR-SUC**

  Value *1*: Writing successful.

Value *0*: Writing not successful. The value could not be written.

> ▸ Information
>
> In case of reload or Server-Standby switch, the currently active responses or writing affirmations are discarded.

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

WR-ACK, WR-SUC

Result:

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

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

MODULES

This mechanism can be used in the following modules:

- function **Write set value**: Activate option **Wait for writing confirmation** in the configuration dialog of the function.
- **Standard recipes** (on page 14): Activate property **Write synchronously**.
- **Recipe Group Manager** Activate property **Write synchronously**.

ENTRY IN CEL

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

- **Function Write set value**

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

- **Log set value for set value changes only**

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

- **Text on set value change**

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

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

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

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

The following will be displayed in the CEL entry:

- The name of the original recipe or the recipe group
- The name of the new recipe or the recipe group
- The Recipe version

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

Standard recipes and Recipegroup Manager

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

3.7 Write recipes

The execution of the recipe can happen:

- in the Runtime via a button in screen Recipe standard (on page 23),
- via calling up a function engineered in the Editor for the recipe execution via:
  - Script (e.g. AUTOSTART-Script)
  - Variable status
  - Dynamic screen element e.g. Button

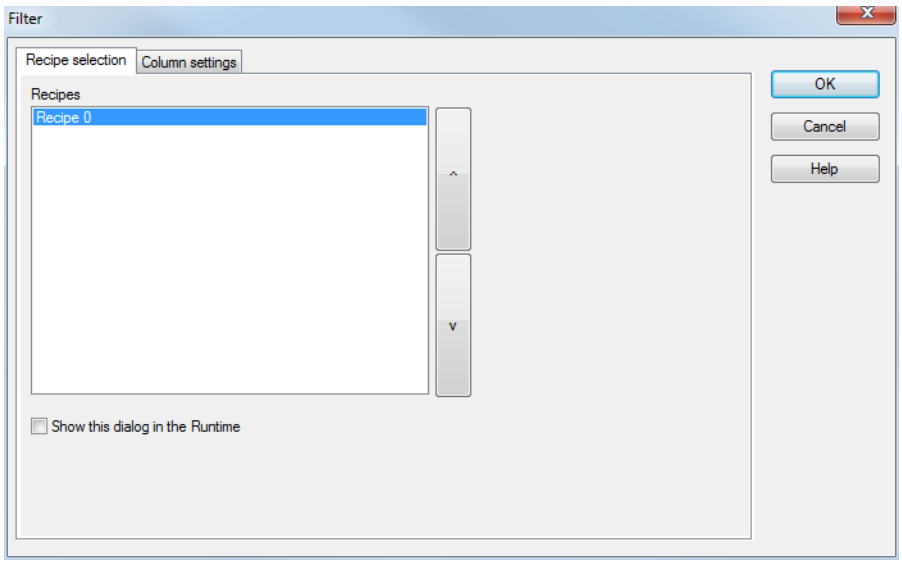
4 Function screen switch standard recipe

The screen switch to a standard recipe function makes it possible to call up a standard recipe screen in the Runtime.

To engineer the function:

1. Create a new function
2. Select screen switching
3. select the deleted screen of type *Standard recipe (on page 23)*
4. the filter dialog opens for
   - Recipe selection (on page 17)
   - Column settings (on page 18)
5. Define **recipe** and **column settings**
6. Close the dialog by clicking on **OK**.

4.1 Tab Recipe selection

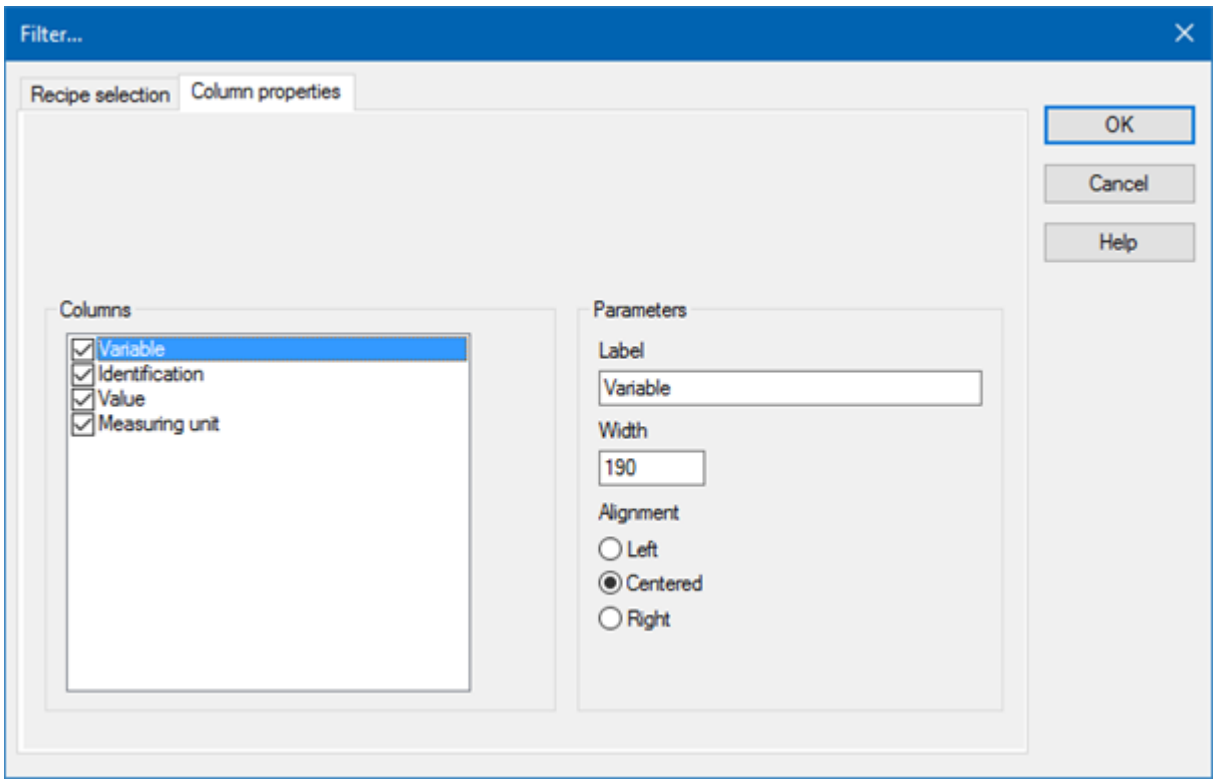


Parameter	Description
Recipes	Selection of the recipe which should be displayed when the screen is called up.
Show this dialog in the Runtime	*active:* This dialog is displayed in the Runtime when switching screens. The selected recipe can be changed.

Parameter	Description
	inactive: The screen is opened with the recipe defined in the Editor. Cannot be changed in the Runtime.

4.2 Tab column settings

Here you define which columns are displayed in what form in the list field.



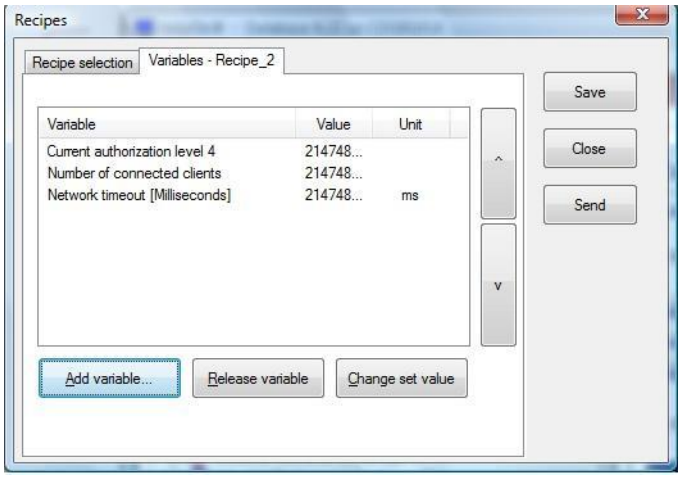
Parameter	Description
Available columns	Definition of the columns displayed in the Runtime.
Parameter	Definition of the properties for highlighted columns.
Label:	Labeling of the column in the Runtime.
Width:	Width of the column in pixels.
Alignment:	Text alignment of the column.

5 Operation in the Runtime

In online operation the following functions are available for script use:

Parameter	Description
Single recipe direct (on page 20)	Direct despatch of the activated recipe
Single recipe with offline dialog (on page 20)	Changing of the parameters of the activated recipe
Single recipe with online dialog (on page 20)	Selection of a recipe and changing of its parameters

By using the function Recipe single with offline dialog (on page 20) the recipe mask is opened.



The control buttons are:

Parameter	Description
Save	Save changes in the recipe
Close	Close recipe settings.
Send	Send recipe to the hardware with the current parameters.
Add variable	Add new variable with the variables list.
Release variable	Temporary deletion of the selected variable from the recipe (permanently deleted if recipe is saved).
Change set value	Change set value of the selected variable. A decimal value can be entered with a colon as well as with a point, the decimal point will automatically be changed to a point. **Attention:** If this element does not exist in the screen, the recipes in

Parameter	Description
	the list element are displayed read-only.

By using the function Recipe single with online dialog (on page 20), the recipe and the parameters of the recipe can be selected and changed. The recipe selection is opened. The operation is similar to the parametrization in the Editor with the exception that recipes cannot be deleted.

Information

In case of reload or Server-Standby Switch, the present responses or writing affirmations are distorted.

You can find more information on amended Runtime files in the Runtime changeable files chapter.

OPERATING AUTHORIZATION IN THE RUNTIME

Actions in the Runtime can be protected with a password and authorization levels:

- When recipes are deleted, saved, changed or duplicated, the logged in user has to fulfil the authorization requirements that have been set in the authorization level section of the recipe. If the user does not fulfill the authorization requirements, the function is not executed.
- At password-protected button **Change set value** the value in the list can only be changed if the user has the respective authorization level. If this is not the case the dialog for login is opened for active temporary login as soon as a column for changing a value is clicked.
- If button **Save changes** is protected with a password and the user does not have the necessary authorization level, the dialog for temporary login is opened after a recipe change when the dialog is closed in order to make saving of the changes possible.

5.1 Recipe - Functions

In order to alloww operation in the Runtime, the according recipe functions have to be created.

When the standard function is created from the context menu in the detail view, zenon automatically creates a function **Standard recipe** for the selected recipe.

5.1.1 Single recipe

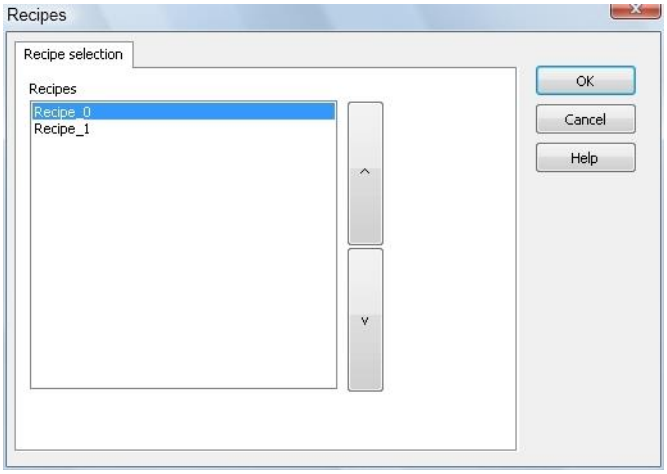
The individual recipe function is available in three versions:

- Single recipe direct
- Single recipe with offline dialog
- Single recipe with online dialog

SINGLE RECIPE DIRECT

This function is used to execute a defined recipe in the Runtime. In a recipe only process variables of one driver can be selected.

Give the recipe as a transfer parameter. This function is configured via a dialog.



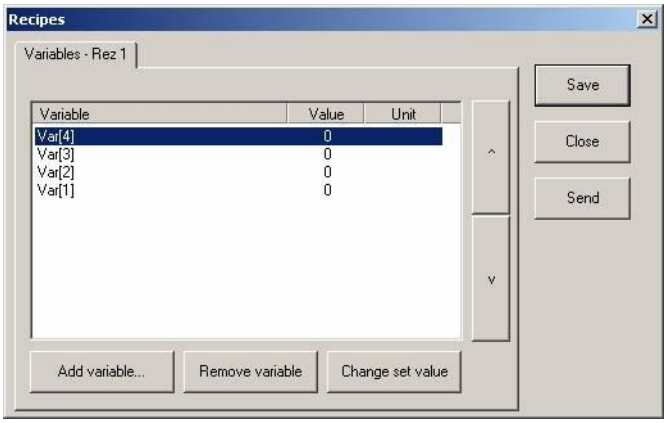
SINGLE RECIPE WITH OFFLINE DIALOG

This function is used to change a defined recipe, before it is executed in the Runtime (set value change).

Give the recipe as a transfer parameter. This function is configured via a dialog.

The new recipe is available in the recipe list.

Only the set value setting of the recipe is activated during online operation.



Possible operations in Editor and Runtime are:

Parameter	Description
Add variable	add a new variable to the recipe

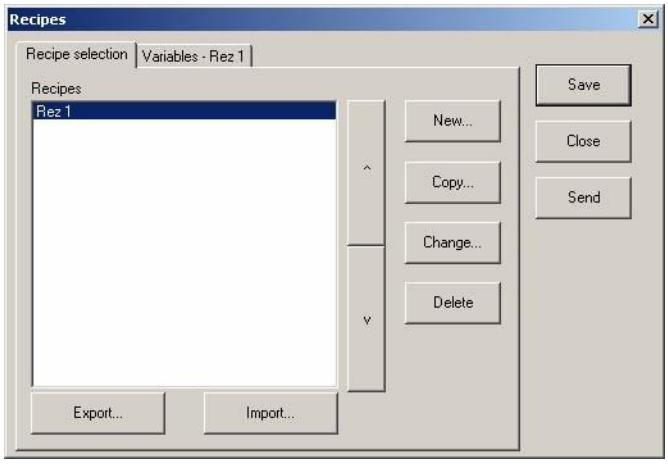
Parameter	Description
Release variable	remove a variable from the recipe
Change set value	change the values of the recipe

SINGLE RECIPE WITH ONLINE DIALOG

This function is used to select and change a recipe before it is issued during online operation (change of set value).

Give the recipe as the transfer parameter. This function is configured via an input dialog.

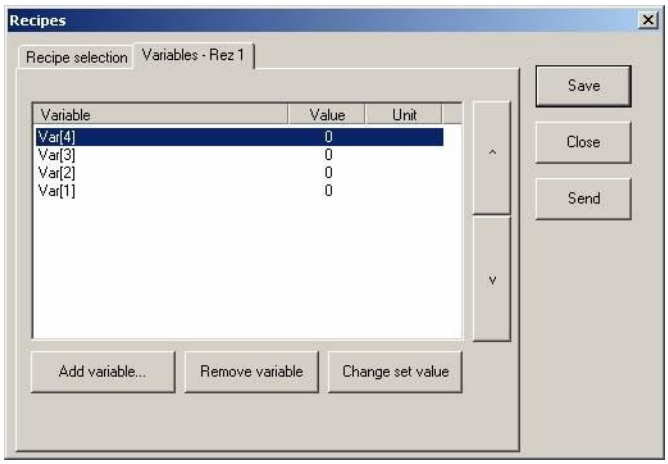
In the Runtime the recipe selection is opened.



Configurable entries are

Parameter	Description
New	create a new recipe
Copy	copy selected recipe and save it under a new name
Change	Change the name of the selected recipe
Delete	delete selected recipe

The new recipe is available in the recipe list.



Configurable options are:

Add variable	add a new variable to the recipe
Release variable	remove a variable from the recipe
Change set value	change the values of the recipe

In order to prevent changes to the recipe entries and at the same time permit selection of the individual recipes during online operation, make an entry in the *zenon6.ini* file.

[FUNKTIONEN]	
REZEPT_AENDERN=	*0*: change not permitted *1*: 1: change permitted (default)

5.1.2 Standard recipe

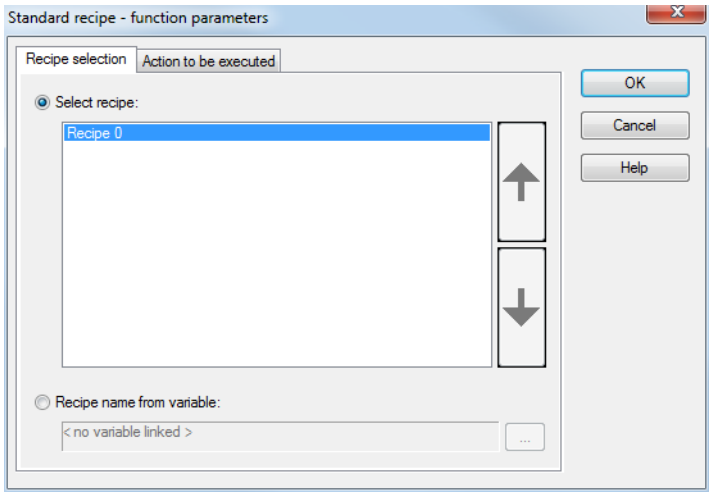
With this function an existing recipe can be executed, read from the hardware or exported in the Runtime. Additionally new recipes can be imported or created with the current values from the hardware.

To create the function:

1. create a new function

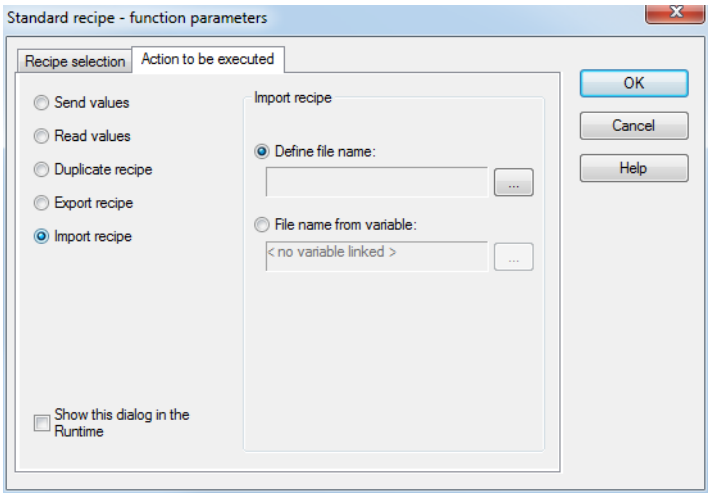
2. in the **Recipes** node, select the **Display menu** function
3. the dialog for the recipe selection is opened
4. on tab **Recipe selection** select the recipe which should be called up
5. You define the action to be carried out in the Runtime in the **Action to be executed** tab

RECIPE SELECTION



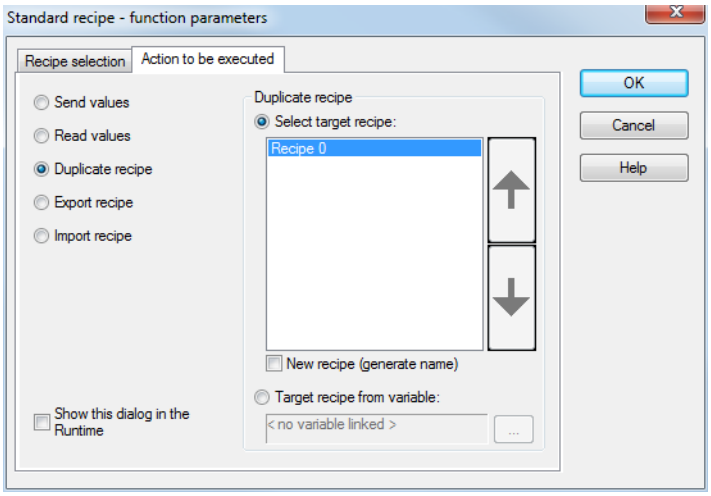
Parameter	Description
Select recipe	Selection of the recipe that should be read or written
Recipe name from variable	The name of the recipe that should be read or written is given by the selected variable. **Attention:** In the Runtime, the string variable must contain a valid recipe name, such as *Recipe_4*, before execution. Otherwise the function will not be executed.

ACTION TO BE EXECUTED



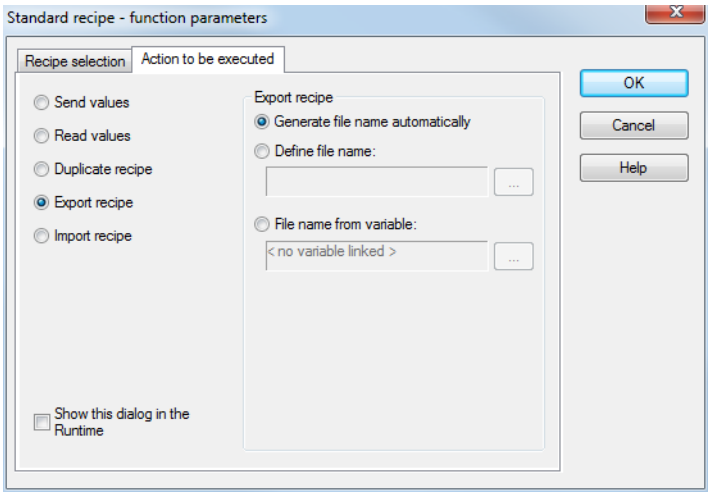
Parameter	Description
Send values	The values of the variables of the selected recipe are written to the PLC.
Read values	The values of the variables of the selected recipe are read from the PLC and replace the current values in the recipe.
Copy recipe	The source recipe creates a copy of itself with the name of the target recipe. The name of the duplicated recipe is not stored in the variable **_LASTNEWRECIPE**. For details about configuration see chapter **Duplicate recipe**.
Export recipe	Exports recipe. For details about configuration see chapter **Export recipe**.
Import recipe	Imports recipes from file or variable. For details about configuration see chapter **Import recipe**.
Show this dialog in the Runtime	Offer dialog in the Runtime in order to change settings.

COPY RECIPE



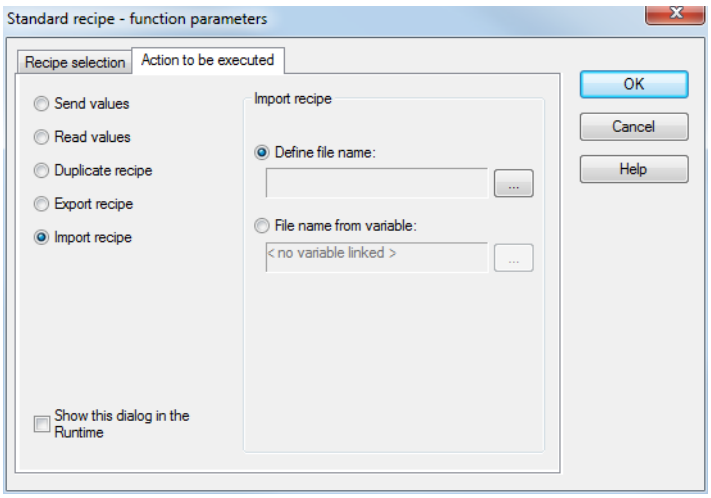
Parameter	Description
Select target recipe	Selection of an existing recipe, which should be overwritten with the data of the source recipe. **Attention:** The data of the target recipe are overwritten.
New Recipe **(Generate name)**	A new recipe is created according to the standard syntax. With this gaps in the recipe order are filled up automatically. **Example:** *Recipe_0* and *Recipe_2* already exist. Duplicating the first time creates a recipe with the name *Recipe_1*. Duplicating a second time creates a recipe with the name *Recipe_3*.
Target recipe from variable	The name of the target recipe is defined by the contents of a string variable. **Note:** If the string variable of the target recipe does not contain text, a recipe name is given automatically.

EXPORT RECIPE



Parameter	Description
Generate file name automatically	The filename is created automatically.
Define file name	Click on the **...** button to open the dialog to select a folder and give it a name.
File name from variable	The name of the file is defined by the contents of a string variable.

IMPORT RECIPE



Parameter	Description
Define file name	Click on the **...** button to open the dialog to select a folder and a file.
File name from	Recipe is imported from linked variable

Parameter	Description
variable	

5.2 Status information for recipes and Recipegroup Manager

Status information is provided in the Runtime when doing the following:

- Read/write
- Export/Import
- Saving

If a recipe written, this variable contains the result of the writing operation.

VALUES

WRITE RECIPE

System driver variable **Standard recipe/RGM recipe completely written**

Value	Result
0	Send initialization value before the recipe
1	Write completed successfully
2	Write not executed because of a parameter error
3	Write not completed successfully
4	Wait for ready
5	Write terminated because RT is being ended
6	Timeout occurred
7	Writing was not carried out because of an interlocking condition
8	Writing was not carried out because the recipe contains invalid values

Note: If the network functionality is active in the project, the system driver variable **Standar recipe/RGM recipe completely written (local)** is relevant for the function executed on the local computer.

Information

Writing means writing to the driver. The driver then transfers the recipe to the control. That means:

- **Write synchronously** property *inactive*: Value *1* for **Standard recipe/RGM recipe written completely** does not mean that the values are available in the PLC. They are only written to the driver.
- **Write synchronously** property *active*: The value change take place when all values on the control are topical.

Note: The progress display at writing is only display if property **Write synchronously** is active.

RECIPE IN PROGRESS

System driver variable **Standard recipe/RGM recipe function in progress**

Value	Result
-1	is being executed
0	Initialization value read successfully
1	User has no authorization
2	no authorization in the network
3	chancel by user
4	Error - could not read everything successfully, e.g. - Communication with the hardware is interrupted before read was started - a data block is not available on the PLC - Error during transmission
5	Error during save of the recipe file
6	Function cancelled via VBA

SCREEN TYPE SPECIFIC FUNCTIONS

During

- reading (system driver variable: **Standard recipe/RGM recipe reading all values finished**
- Exporting/Importing and
- Saving

of a recipe via screen specific function - the following values are available:

Value	Result
0	Initialization value waits for response from driver
1	read successfully
2	Error during Read, Export/Import or Save: ▸ Communication with the hardware is interrupted before read was started ▸ a data block is not available on the PLC ▸ Error during transmission