zenon
by COPA-DATA

# zenon driver manual
## SYSDRV

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 SYSDRV

zenon system driver for reading out internal project information, network information, hardware information of the PC etc.

The driver does not use up any licensed tags.

### Attention

Each system driver variable can only be present once per project.

Which variables are present and how often these are present can be checked with the Diagnosis Viewer (on page 86) tool. The corresponding error message starts with: **Systemdriver variable is not unique!**

# 3 SYSDRV - data sheet

| General: | |
|---|---|
| Driver file name | SYSDRV.exe |
| Driver name | Driver for system variables |
| PLC types | -- |
| PLC manufacturer | zenon system driver; Internal driver |

| Driver supports: | |
|---|---|
| Protocol | unknown |
| Addressing: Address-based | Name based |
| Addressing: Name-based | -- |
| Spontaneous communication | -- |
| Polling communication | X |
| Online browsing | -- |
| Offline browsing | -- |
| Real-time capable | -- |
| Blockwrite | -- |
| Modem capable | -- |
| RDA numerical | -- |

| Driver supports: | |
|---|---|
| RDA String | -- |
| Hysteresis | -- |
| extended API | -- |
| Supports status bit **WR-SUC** | -- |
| alternative IP address | -- |

| Requirements: | |
|---|---|
| Hardware PC | -- |
| Software PC | -- |
| Hardware PLC | -- |
| Software PLC | -- |
| Requires v-dll | X |

| Platforms: | |
|---|---|
| Operating systems | Windows 10; Windows 7; Windows 8; Windows 8.1; Windows Server 2008 R2; Windows Server 2012; Windows Server 2012 R2; Windows Server 2016 |

# 4 Driver history

| Date | Driver version | Change |
|---|---|---|
| 07.07.08 | 600 | Created driver documentation |
| 15.3.2016 | 26868 | Name of system driver variables can be changed. |
| 12.2.2018 | | New topic Automatic Line Coloring - module **Load flow calculation**. |

### DRIVER VERSIONING

The versioning of the drivers was changed with zenon 7.10. There is a cross-version build number as of this version. This is the number in the 4th position of the file version,
For example: **7.10.0.4228** means: The driver is for version **7.10** service pack **0**, and has the build number **4228**.

Expansions or error rectifications will be incorporated into a build in the future and are then available from the next consecutive build number.

#### Example

A driver extension was implemented in build **4228**. The driver that you are using is build number **8322**. Because the build number of your driver is higher than the build number of the extension, the extension is included. The version number of the driver (the first three digits of the file version) do not have any significance in relation to this. The drivers are version-agnostic

# 5 Configuration

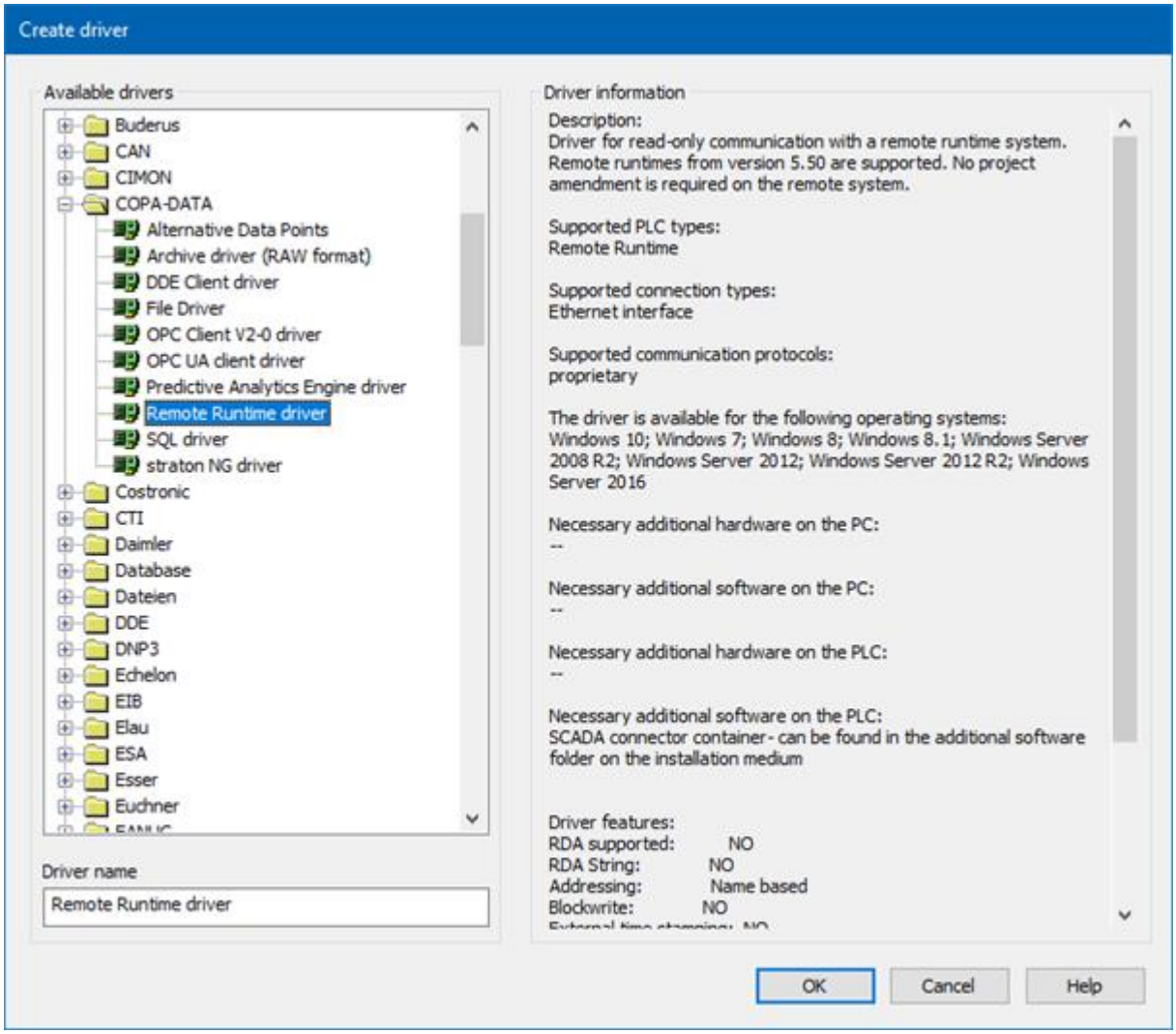
In this chapter you will learn how to use the driver in a project and which settings you can change.

#### Information

Find out more about further settings for zenon variables in the chapter Variables of the online manual.

## 5.1 Creating a driver

In the **Create driver** dialog, you create a list of the new drivers that you want to create.




| Parameter | Description |
|---|---|
| **Available drivers** | List of all available drivers.<br><br>The display is in a tree structure:<br>*[+]* expands the folder structure and shows the drivers contained therein.<br>[-] reduces the folder structure<br><br>Default: *No selection* |
| **Driver name** | Unique **Identification** of the driver.<br><br>Default: *empty*<br>The input field is pre-filled with the pre-defined |

| Parameter | Description |
|---|---|
| | **Identification** after selecting a driver from the list of available drivers. |
| **Driver information** | Further information on the selected driver.<br>Default: *empty*<br>The information on the selected driver is shown in this area after selecting a driver. |

### CLOSE DIALOG

| Option | Description |
|---|---|
| **OK** | Accepts all settings and opens the driver configuration dialog of the selected driver. |
| **Cancel** | Discards all changes and closes the dialog. |
| **Help** | Opens online help. |

> **Information**
>
> The content of this dialog is saved in the file called Treiber_[Language].xml. You can find this file in the following folder:
> *C:\ProgramData\COPA-DATA\zenon[version number]*.

## CREATE NEW DRIVER

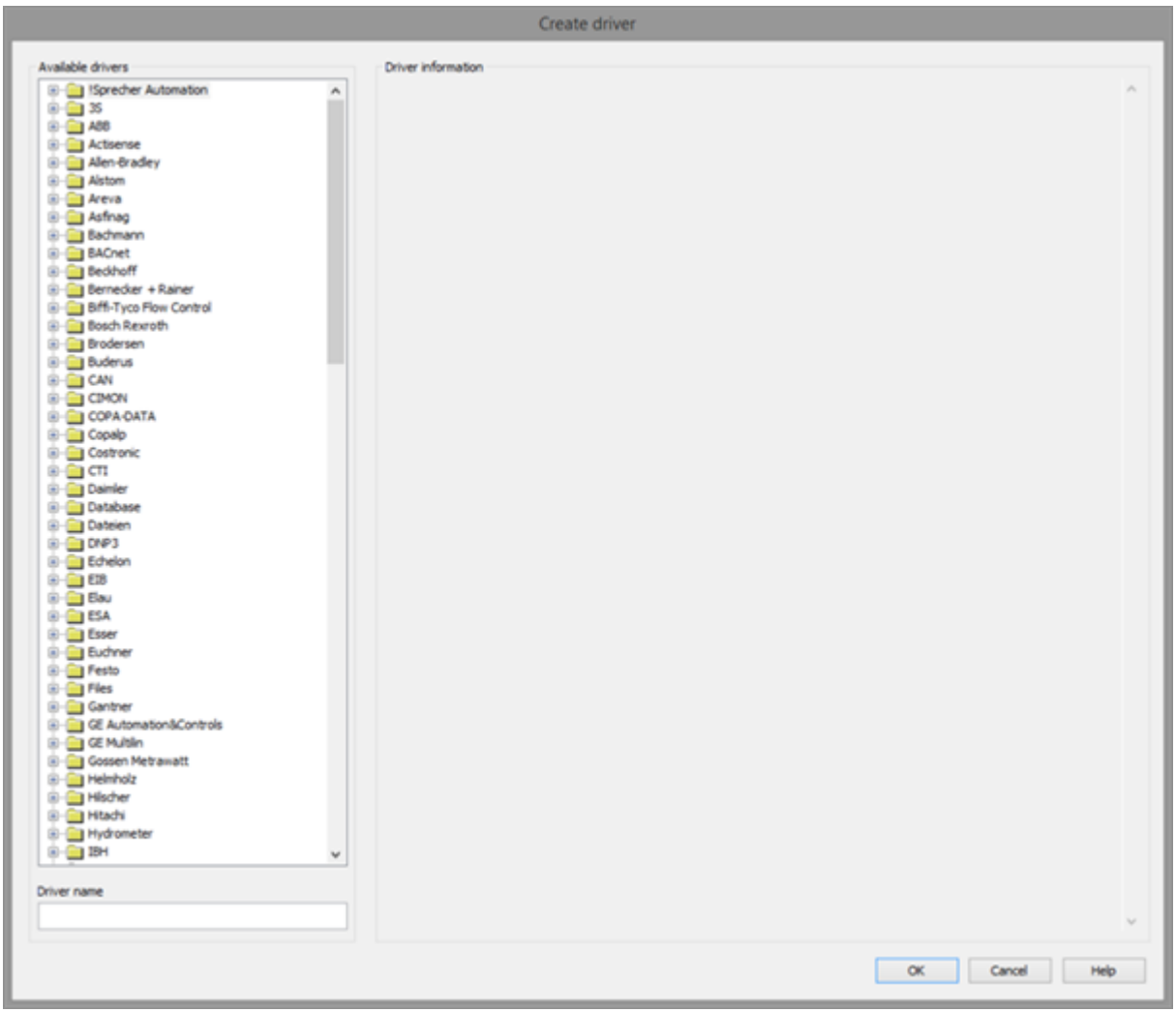
In order to create a new driver:

1. Right-click on **Driver** in the Project Manager and select **New driver** in the context menu.

   Optional: Select the **New driver** button from the toolbar of the detail view of the **Variables**.The Create driver dialog is opened.

   The **Create simple data type** dialog is opened.

2. The dialog offers a list of all available drivers.




3. Select the desired driver and name it in the **Driver name** input field.
This input field corresponds to the **Identification** property. The name of the selected driver is automatically inserted into this input field by default.
The following is applicable for the **Driver name**:

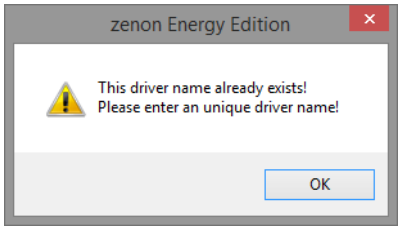
   - The **Driver name** must be unique.
   If a driver is used more than once in a project, a new name has to be given each time. This is evaluated by clicking on the **OK** button. If the driver is already present in the project, this is shown with a warning dialog.
   - The **Driver name** is part of the file name.
   Therefore it may only contain characters which are supported by the operating system. Invalid characters are replaced by an underscore (_).
   - **Attention:** This name cannot be changed later on.

4. Confirm the dialog by clicking on the **OK** button.
The configuration dialog for the selected driver is opened.

**Note:** The language of driver names cannot be switched. They are always shown in the language in which they have been created, regardless of the language of the Editor. This also applies to driver object types.

### DRIVER NAME DIALOG ALREADY EXISTS

If there is already a driver in the project, this is shown in a dialog. The warning dialog is closed by clicking on the **OK** button. The driver can be named correctly.




### ZENON PROJECT

The following drivers are created automatically for newly-created projects:

- **Intern**
- **MathDr32**
- **SysDrv**

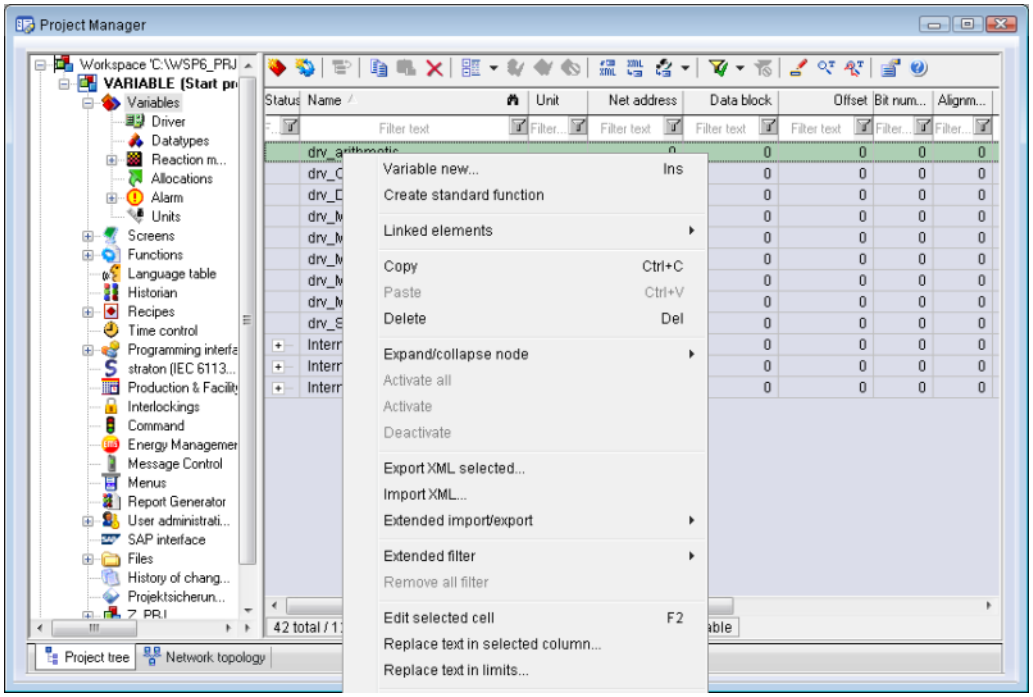
> **Information**
>
> Only the required drivers need to be present in a zenon project. Drivers can be added at a later time if required.

# 6 Creating variables

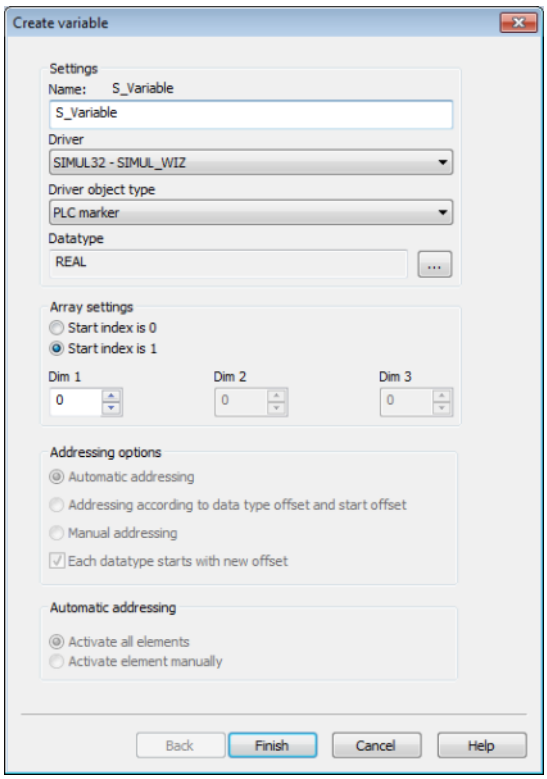
This is how you can create variables in the zenon Editor:

## 6.1 Creating system driver variables

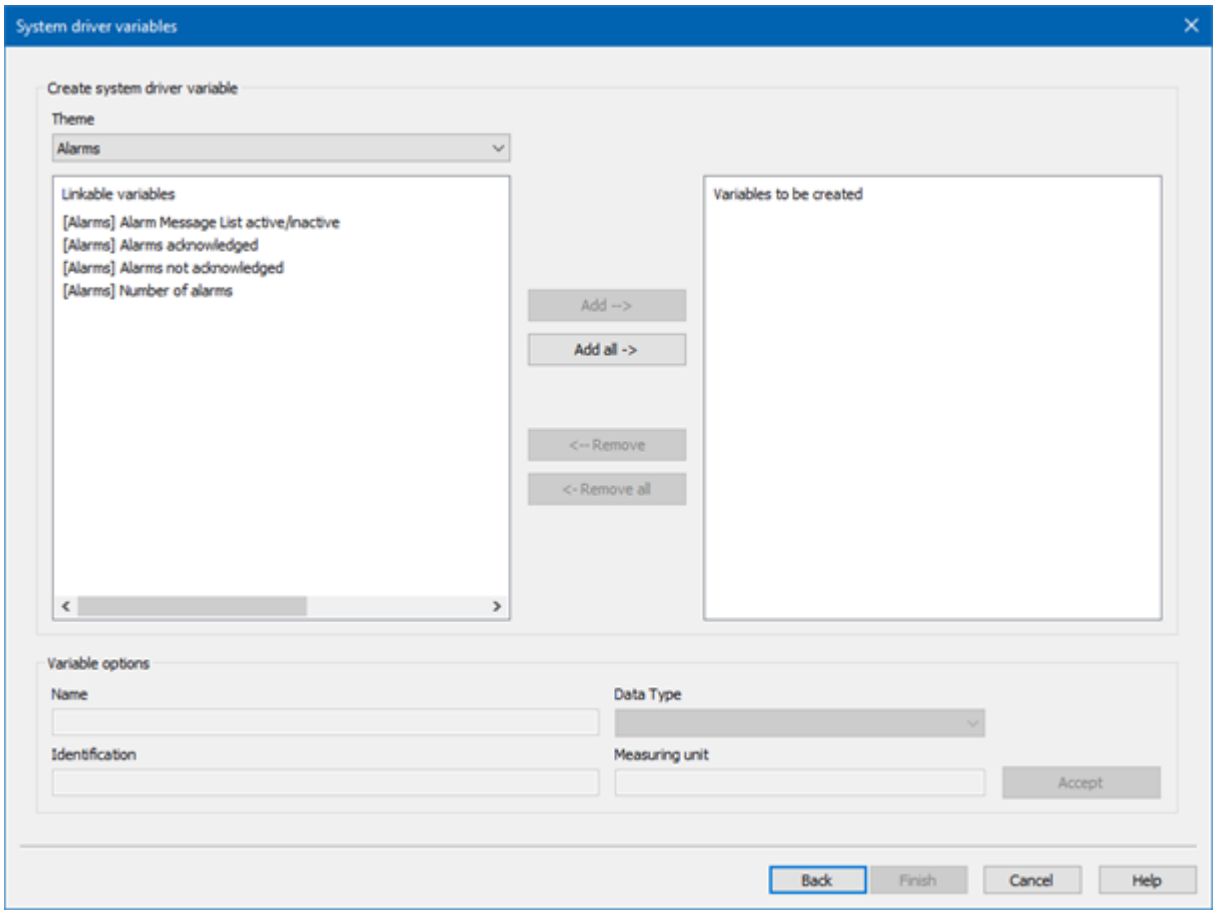
In the Project manager right-click on **Variable** and select **New variable...** in the context menu.




In the following dialog, select *SYSDRV - driver for system variables* as a **Drivers** and **Driver Object Type** as a *system driver variable*.



Click on **Next**.




The following settings are available:

### THEME

Select the subject area from which you want to create system driver variables. The attendant system driver variables are shown in a list and can be selected for the creation. Multiple selection is possible. As long as you edit a selected variable, the selection is disabled.

| Parameter | Description |
|---|---|
| **Linkable variables** | All system driver variables which are still available for the selected subject area. Already created variables or variables which are displayed in list **Variables to be created** are not displayed.<br><br>Selection of the theme by clicking on the drop-down list. |
| **Add** | Adds the currently selected variables to the *list of the variables to be created*. |

| Parameter | Description |
|---|---|
| **Add all** | Adds all variables which are displayed in list **Available variables** to the *list of the variables to be created*. |
| **Remove** | Removes all selected variables from the *list of the variables to be created*. |
| **Remove all** | Removes all variables from the *list of the variables to be created*. |
| **Variables to be created** | All system driver variables which you have selected and created with the help of button **Finish**. If you select one variable, you can edit it under **Variable options**. |

### VARIABLE OPTIONS

| Parameter | Description |
|---|---|
| **Name** | Edit the name of the selected variables.<br>This corresponds to the **Name** property in the Editor.<br>**Note:** Only available if a variable has been selected in the **list of variables to be created**. |
| **Identification** | Edit the identification of the selected variables.<br>This corresponds to the **Identification** property in the Editor.<br>**Note:** Only available if a variable has been selected in the **list of variables to be created**. |
| **Data Type** | Edit the data type of the selected variables.<br>This corresponds to the **Data Type** property in the Editor.<br>**Note:** Only available if a variable has been selected in the **list of variables to be created**.<br>This variable must be a user-defined variable. |
| **Measuring unit** | Edit the measuring unit of the selected variables.<br>This corresponds to the **Measuring unit** property |

| Parameter | Description |
|---|---|
| | in the Editor.<br><br>**Note:** Only available if a variable has been selected in the **list of variables to be created**. |

### NAVIGATION

| Parameter | Description |
|---|---|
| **Apply** | Left-click this button in order to apply the changed settings to the selected variable.<br><br>Not active if no change has been made in the properties.<br><br>Note:<br>▸ If you select another variable before you click on Apply, all changes are canceled. Only valid changes can be applied.<br>▸ Ensure that changes to the **Name**, **Identification** or **Measurement unit** properties are confirmed with the **Apply** button. |
| **Back** | Switches to driver selection dialog.<br><br>The variables transferred in the *List of variables to be created* are retained. |
| **Finish** | Applies settings and closes the dialog.<br><br>The selected variables are created in the Editor. |
| **Cancel** | Discards all changes and closes the dialog. |
| **Help** | Opens online help. |

### CHANGING THE NAME OF A SYSTEM DRIVER VARIABLE

From zenon 7.50, system driver variables can be changed in the Editor.

Please note:
Ensure that changes to the **Name**, **Identification** or **Measuring unit** properties are confirmed with the **Apply** button. Changes are not transferred to the project by confirming with the Enter key alone.

### Attention

Note that, with a change to an existing system driver variable with the **Type** property in the **System driver variable** property group, the name is not changed automatically.

Amend the **Name** and **Identification** properties manually.

#### CHANGING THE STRING LENGTH

The string length of the system driver variables with *string* date type is possible. Configure your change in the **String length** variable property. You can find this property in the **Addressing** property group.

### Hint

The string length must be limited to 256 characters in order to use system driver variables in zenon Logic.

## 6.2 General notes

### VARIABLES IN THE NETWORK

Variables that contain a reference (global/local) at the end of the name can be created in either the global or local version. All other variables are always local.

- All local variables are saved locally on the respective workstation (client/server/standby). The behavior of the variable can change, according to the position of the computer in the network topology.
- All global variables are depicted on the server (standby) and distributed to the network (clients). Changes to these variable values are always applicable throughout the network.

### RELOAD PROJECT ONLINE

The values of all system driver variables remain unchanged after reloading.

## 6.3 Theme - [Alarms]

The following system driver variables are available for this subject area:

| Name | Data type | Comment |
|---|---|---|
| **[Alarms] Alarms not acknowledged** | *UDINT* | Shows the number of not acknowleged alarms in the memory |
| **[Alarms] Alarms acknowledged** | *UDINT* | Shows the number of acknowleged alarms in the memory |
| **[Alarms]Alarm Message List active/inactive** | *BOOL* | Displays the status of the Alarm Message List:<br>▸ *0*: inactive<br>▸ *1*: active |
| **[Alarms]Number of alarms** | *UDINT* | Shows the number of alarms in memory. |

## 6.4 Theme - [Historian]

The following system driver variables are available for this subject area:

| Name | Data type | Comment |
|---|---|---|
| **[Historian] Memory for Historian** | *UDINT* | Shows the amount of memory reserved for archive data processing (e.g. in the Extended Trend). |
| **[Historian] Last lot selected** | *STRING* | Contains the last lot selected in the lot filter or time filter. |

## 6.5 Theme - [Automatic Line Coloring]

System driver variables of this issue are only visible with corresponding licensing.

The following system driver variables are available for this subject area:

| Name | Data type | Comment |
|---|---|---|
| **[Automatic Line Coloring] Load flow calculation (n-1) result** | *DINT* | Displays the result of the (n-1) calculation.<br>▸ *-1:*<br>(n-1) calculation is deactivated.<br>Property **Activate (n-1) calculation** inactive.<br>▸ *0...n*<br>Number of scenarios which are not (n-1) secure. |

| Name | Data type | Comment |
|---|---|---|
| | | This is the case when (n-1) load > power + configured overload (property: **Maximum acceptable current overload [%]**). |
| **[Automatic Line Coloring] Load flow calculation state** | *UDINT* | Shows the projected type of the load flow calculation.<br>▸ *0:* The load flow calculation is disabled for the current projecting.<br>▸ *1:* The load flow calculation is enabled for the current projecting **without State Estimator**.<br>▸ *2:* The load flow calculation is enabled for the current projecting **with State Estimator**.<br>The value is updated at starting or during reloading the zenon Runtime.<br>**Note:** The result of this system driver variable matches the current projecting of property **Activate load flow calculation**. |
| **[Automatic Line Coloring] Load flow calculation error** | | Displays the quality of the calculation of module **Load flow calculation**.<br>▸ *0: no error* The load flow calculation could be finished with a conclusive result.<br>▸ *1: no calculation possible* The load flow calculation can not be carried out. Possible causes:<br>- missing or invalid measurements<br>- undefined state of a switch (neither on nor out)<br>▸ *2: not used.* *Reserved for future versions.*<br>▸ *3: invalid result* The load flow calculation could not |

| Name | Data type | Comment |
|---|---|---|
| | | reach a conclusive result.<br>The error cause is protocoled in the LOG of the **Diagnosis Viewer**. |

**LOG ENTRIES**

| Parameter | Level | Description |
|---|---|---|
| *Cannot calculate load flow due to invalid switch positions or measured values* | **ERROR ALC** | No load flow could be calculated as at least one measurement is missing (*INVALID*) or at least one switch is neither on nor off. |
| *Calculation of load flow did not converge to a result.* | **ERROR ALC** | The load flow calculation could not achieve a conclusive result.<br>Possible cause:<br>▸ not enough information from measurements or distorted measurements. |

## 6.6 Theme - [Batch Control]

The following system driver variables are available for this subject area:

| Name | Data type | Comment |
|---|---|---|
| **[Batch Control] Export result numeric** | *DINT* | The numeric variable is filled with the number of errors that occurred.<br>Example:<br>▸ *-1*: is being executed<br>▸ *0*: Initialization value read successfully<br>▸ from 1: Number of errors that occurred |
| **[Batch Control] Export result text** | *STRING* | The string variable is filled with the result of the export. |
| **[Batch Control] Export result XML** | *STRING* | The results of the XML export of the recipe are entered into this variable. They can be created using the Editor and the system driver. This variable can be used for automated evaluation of the XML export. |

| Name | Data type | Comment |
|---|---|---|
| | | They are local string variables.<br><br>You can find details of the structure of the XML file in the **Format STRING variable export/import of batch recipes or command sequences** (on page 25) chapter. |
| **[Batch Control] Import result numeric** | *DINT* | The numeric variable is filled with the number of errors that occurred.<br><br>Example:<br>▸ *-1*: is being executed<br>▸ *0*: Initialization value read successfully<br>▸ from 1: Number of errors that occurred |
| **[Batch Control] Import result text** | *STRING* | The string variable is filled with the result of the import.<br><br>Batch XML import specific error:<br>▸ *The master recipe of the control recipe could not be found. therefore the control recipe cannot be imported.*<br>▸ *The master recipe of the control recipe is not released. therefore the control recipe cannot be imported.*<br>▸ *The control/master recipe cannot be imported because it is an invalid instance of the master recipe.*<br>▸ *The control/master recipe could not be created due to an invalid job variable.*<br>▸ *The control/master recipe could not be created due to an invalid value of the job variable.*<br>▸ *The control/master recipe could not be overwritten because it does not have the correct status.*<br>▸ *The control recipe cannot be imported as a new version. The versioning is not active.*<br>▸ *The control/master recipe could not be imported because it does not match the* |

| Name | Data type | Comment |
|---|---|---|
| | | *selected type.*<br>▸ *The master recipe could not be imported because its name is not permitted.*<br>▸ *The control recipe and master recipe could not be imported because the name is not permitted.*<br>▸ *The operation template could not be imported because the name is not permitted.* |
| **[Batch Control] Import result XML** | *STRING* | The results of the XML import of the recipe are entered into this variable. They can be created using the Editor and the system driver. This variable can be used for automated evaluation of the XML import.<br>They are local string variables.<br>You can find details of the structure of the XML file in the **Format STRING variable export/import of batch recipes or command sequences** (on page 25) chapter. |
| **[Batch Control] Recipe terminated due to an error** | *BOOL* | Is set to *1* if a recipe cannot be restarted. Before creating an image, the variable is set to *0*.<br>This variable is distributed in the network. |
| **[Batch Control] Set value input: Measuring unit** | *STRING* | Unit of the variable. |
| **[Batch Control] Set value input: Parameter Maximum** | *STRING* | Parameter Maximum<br>The variable is filled with the maximum of the parameter when edited. If the minimum or the maximum of the parameter is edited, the variable with the maximum of the variables is filled.<br>If the "Amendable in the control recipe" bit is edited, it receives the value 1. |
| **[Batch Control] Set value input: Parameter Minimum** | *STRING* | Parameter Minimum<br>The variable is filled with the minimum of the parameter when edited. If the minimum or the maximum of the parameter is edited, the variable |

| Name | Data type | Comment |
|---|---|---|
| | | with the minimum of the variables is filled.<br><br>If the "Amendable in the control recipe" bit is edited, it receives the value *0*. |
| **[Batch Control] Set value input: Parameter description** | *STRING* | Description of the tag. |
| **[Batch Control] Set value input: Parameter property** | *STRING* | Property that is edited at the parameter. |
| **[Batch Control] Set value input: Parameter Name** | *STRING* | Name of the parameter whose property is being edited. |
| **[Batch Control] Set value input: String length** | *DINT* | String length of the variable. |
| **[Batch Control] Set value input: Variable maximum** | *STRING* | Maximum of variables linked to the parameter. |
| **[Batch Control] Set value input: Variable minimum** | *STRING* | Minimum of variables linked to the parameter. |
| **[Batch Control] Create control recipe result numerically** | | Procedure for automatic creation of control recipes. Result is a numerical value.<br><br>Values:<br>▸ *-1*: Creation is carried out.<br>▸ *0*: All control recipe CRs created successfully.<br>▸ *>=1*: Number of errors that occurred. Corresponds to the number of recipes that have not been created.<br><br>**Attention:** No new control recipe can be created when the value is set to *-1*! Only once the values for the created recipes are present can the creation of the next recipe be started. |
| **[Batch Control] Create control recipe: result text** | | Procedure for automatic creation of control recipes. Result is displayed as a string.<br><br>Values:<br>▸ Empty string: No error, or action is executed |

| Name | Data type | Comment |
|---|---|---|
| | | The following can be errors:<br>▸ General error<br>▸ error reading variables:<br>General error without details.<br>▸ Variable value read outside the limits:<br>If parameter value can be edited in the control recipe, no error. Otherwise: Error:<br>General error without details.<br>▸ Error for non-unique CR name |
| **[Batch Control] Create control recipe result XML** | | Procedure for automatic creation of control recipes. Result is displayed as an XML.<br>Values:<br>▸ Empty string: Action is carried out.<br>The following can be errors:<br>▸ general error<br>▸ error reading variables:<br>List of the variables, information on whether *Invalid Bit* or timeout.<br>▸ Variable value read outside the limits:<br>If parameter value can be edited in the control recipe, no error. Otherwise: Error:<br>List of the variables, information on whether *Invalid Bit* or timeout.<br>▸ Error for non-unique CR name<br>▸ **Attention:** No new control recipe can be created when the value is empty! Only once the values for the created recipes are present can the creation of the next recipe be started. |

### 6.6.1 Format STRING variable export/import of batch recipes or command sequences

The results of the XML export/import of batch recipes and command sequences are shown in a STRING variable with XML formatting.
In doing so, the following parameters are used:

| Parameter | Description |
|---|---|
| **MrId** | Contains one of the following items of information:<br>▸ ID of the exported master recipe.<br>▸ ID of the master recipe for the exported control recipe.<br>▸ ID of the exported command sequence. |
| **CrId** | ID of the exported control recipe. |
| **OpId** | ID of the exported operation. |
| **Type** | Recipe type, coded as a number:<br>▸ 1: Master recipe<br>▸ 2: Control recipe<br>▸ 4: Operation template |
| **MrName** | Contains one of the following items of information:<br>▸ Name of the exported master recipe.<br>▸ Name of the master recipe for the exported control recipe.<br>▸ Name of the exported command sequence. |
| **CrName** | Name of the exported control recipe. |
| **OpName** | Name of the exported operation template. |
| **MrVersion** | Contains one of the following items of information:<br>▸ Version of the exported master recipe.<br>▸ Version of the master recipe for the exported control recipe. |
| **Results** | Node under which the results are listed. |
| **CommandSequence** | Node for the results of the export/import of a command sequence. |
| **Recipe** | Node for the results of the export/import of a batch control recipe. |
| **GeneralErrors** | Node under which general errors are listed. This refers to errors that are not assigned to a recipe or a command sequence. |

| Parameter | Description |
|---|---|
| **Error** | Entry of an individual general error. |
| **ErrorText** | Entry for a recipe-specific error during import. Is only filled if a recipe could not be imported. |
| **ImportSuccess** | Switch that shows the success of the import:<br>▸ *1*: Recipe was imported successfully.<br>▸ *0*: Recipe could not be imported due to an error. |
| **FileMrName** | Contains one of the following items of information:<br>▸ Name of the master recipe in the XML file.<br>▸ Name of the master recipe for the control recipe in the XML file.<br>▸ Name of the command sequence in the XML file. |
| **FileCrName** | Name of the control recipe in the XML file. |
| **FileOpName** | Name of the operation template in the XML file. |
| **FileMrVersion** | Contains one of the following items of information:<br>▸ Version of the master recipe in the XML file.<br>▸ Version of the master recipe for the control recipe in the XML file. |
| **NewMrName** | Contains one of the following items of information:<br>▸ Name of the imported master recipe.<br>(can be different from the name in the XML file)<br>▸ Name of the master recipe for the imported control recipe.<br>(corresponds to the entry for **FileMrName**.)<br>▸ Name of the command sequence.<br>(can be different from the name in the XML file) |
| **NewCrName** | Name of the imported control recipe.<br>(can be different from the name in the XML file) |
| **NewOpName** | Name of the imported operation template.<br>(can be different from the name in the XML file)<br>Is the name identical to the entry for **FileOpName** then the operation template has been overwritten. |
| **NewMrVersion** | Contains one of the following items of information: |

| Parameter | Description |
|---|---|
| | ▸ Version of the imported master recipe.<br>▸ Version of the master recipe for the imported control recipe. |

## EXAMPLES

### SUCCESSFUL EXPORT OF MASTER RECIPES

```
<?xml version="1.0"?>

<GeneralErrors />
<Results>
	<Recipe>
		<MrName>someRecipe</MrName>
		<MrVersion>1</MrVersion>
		<Type>1</Type>
		<MrId>476</MrId>
	</Recipe>
	<Recipe>
		<MrName>makeCoolStuff</MrName>
		<MrVersion>1</MrVersion>
		<Type>1</Type>
		<MrId>459</MrId>
	</Recipe>
</Results>
```

### FAILED EXPORT

```
<?xml version="1.0"?>
<GeneralErrors>
	<Error>@XML Export Fehler@ (3): @keine Datei ausgewählt.</Error>
</GeneralErrors>
<Results />
```

### IMPORT OF TWO CONTROL RECIPES: 1 SUCCESSFUL, 1 FAILED

```
<?xml version="1.0"?>

<GeneralErrors />
<Results>
	<Recipe>
		<FileMrName>someRecipe</FileMrName>
		<FileMrVersion>1</FileMrVersion>
```

```
        <FileCrName>someRecipe</FileCrName>
        <NewMrName>someRecipe</NewMrName>
        <NewMrVersion>1</NewMrVersion>
        <NewCrName>someRecipe</NewCrName>
        <Type>2</Type>
        <MrId>476</MrId>
        <CrId>1</CrId>
        <ImportSuccess>1</ImportSuccess>
    </Recipe>
    <Recipe>
        <FileMrName>someRecipe</FileMrName>
        <FileMrVersion>1</FileMrVersion>
        <FileCrName>someRecipe 1</FileCrName>
        <Type>2</Type>
        <ImportSuccess>0</ImportSuccess>
        <ErrorText>@Das Steuerrezept@ "someRecipe 1" @, Vorlagenrezept@ "someRecipe
(v1)" @konnte nicht überschrieben werden, da es nicht den richtigen Status hat.</ErrorText>
    </Recipe>
</Results>
```

## 6.7 Theme - [Command Processing]

The following system driver variables are available for this subject area:

### Information

The system driver variables of the Command Processing theme are only available in the Energy Edition.

All these variables are only available locally. If several actions are carried out at the same time, the values of the action that last changed the value is shown.

| Name | Data type | Comment |
|---|---|---|
| **[Command Processing] Screen name** | *STRING* | Name of the current screen of the type Command Processing. |
| **[Command Processing] Screen step** | *DINT* | Number of the active step (stage) of command input:<br>▸ *0*: Initialization<br>▸ *1*: Step 1<br>▸ *2*: Unlocking |

| Name | Data type | Comment |
|---|---|---|
| | | ▸ *3*: Step 2<br>▸ *4*: Lock<br>▸ *5*: Execution |
| **[Command Processing] Identification of the action variable** | *DINT* | Identifies the type of the action to be executed currently:<br>▸ *0*: Pulse command<br>▸ *1*: Switching command<br>▸ *2*: Setpoint input<br>▸ *3*: Status input<br>▸ *4*: Replace<br>▸ *5*: Manual correction<br>▸ *6*: Block<br>▸ *7*: Release<br>▸ *8*: Lock<br>▸ *9*: Revision<br>▸ *10*: Auto/Remote command<br>▸ *11*: Forced command<br>▸ *12*: Check response value<br>▸ *1000*: Not defined |
| **[Command Processing] Name of the action variable** | *STRING* | Name of the variable on which the current action is executed. |
| **[Command Processing] Name of the command group** | *STRING* | Shows the name of the command group in which the action has been configured. |
| **[Command Processing] Name of the response variable** | *STRING* | Shows the name of the response variable. |
| **[Command Processing] Parameter of the action** | *UDINT* | Parameter of the current action.<br>In case of a pulse command, the command processing status will be displayed; otherwise, the current **switching direction** will be displayed. |
| **[Command Processing]** | *BOOL* | This variable is set to *1* briefly if the update of the other |

| Name | Data type | Comment |
|---|---|---|
| **Update** | | **[command]** variables has been completed.<br><br>**Note**: The value *1* signalizes that the variables are consistent. It can be used, for example, to create a **dynamic limit value text**. |
| **[Command Processing] Interlocking code** | *UDINT* | Status of the current interlocking.<br>▸ *0*: Unchecked<br>▸ *1*: no interlocking active<br>▸ *2*: Status already exists<br>▸ *3*: Not used<br>▸ *4*: Not used<br>▸ *5*: Write failed<br>▸ *6*: Internal error<br>▸ *7*: Not used<br>▸ *8*: Incorrect variable type<br>▸ *9*: Not used<br>▸ *10*: Command group not present<br>▸ *11*: Action not present<br>▸ *12*: Not used<br>▸ *13*: Not used<br>▸ *14*: Value of the condition variable missing<br>▸ *15*: Value of condition variable invalid<br>▸ *16*: Topology (can be unlocked)<br>▸ *17*: Topology (cannot be unlocked)<br>▸ *18*: Not used<br>▸ *19*: Not used<br>▸ *20*: Unlockable condition of the action<br>▸ *21*: Non-unlockable condition of the action<br>▸ *22*: Not used<br>▸ *23*: Blocked from commands (M1)<br>▸ *24*: Blocking administration invalid |

| Name | Data type | Comment |
|---|---|---|
| | | ▸ *25*: SBO rejected (Select, or Operate, negative response)<br>▸ *26*: Timeout for SBO activation (no Select confirnation)<br>▸ *27*: Timeout for SBO deactivation (no Cancel confirm.)<br>▸ *28*: Timeout for execution of action<br>▸ *29*: SBO expired (Select termination from PLC) |
| **[Command Processing] Interlocking message** | *STRING* | Shows the text of the active interlocking message. |

## 6.8 Topic - User-defined

The following system driver variables are available for this subject area:

| Name | Data type | Comment |
|---|---|---|
| **User-defined1000** | *BOOL*, *INT*, *LREAL*, *REAL*, *SINT*, *STRING*, *UDINT*, *UINT*, *USINT* | These are local variables that are not updated in the network. You can enter any **name**, **identification**, **data type** and **unit**.<br>**Attention:** These variables have been obsolete since the introduction of the internal driver and should no longer be used. |

## 6.9 Theme - [User administration]

The following system driver variables are available for this subject area:

| Name | Data type | Comment |
|---|---|---|
| **[User Administration] Current authorization group 1** | *UDINT* | Available authorization level for the user currently logged in to zenon. This information is displayed according to the bit encoding system of the user groups.<br>Authorization level 0 corresponds to decimal value 2^0 = 1 |

| Name | Data type | Comment |
|---|---|---|
| | | Authorization level 1 corresponds to decimal value 2^1 = 2<br>Authorization level 0 and 1 corresponds to decimal value 2^0 and 2^1 = 3 etc.<br>The 128 possible authorization levels are distributed to 4 double words (authorization groups 1-4) with increasing value.<br><br>Indicates authorization level 0 - 31. |
| **[User Administration] Current authorization group 2** | *UDINT* | Available authorization level for the user currently logged in to zenon. This information is displayed according to the bit encoding system of the user groups.<br>Authorization level 0 corresponds to decimal value 2^0 = 1<br>Authorization level 1 corresponds to decimal value 2^1 = 2<br>Authorization level 0 and 1 corresponds to decimal value 2^0 and 2^1 = 3<br>etc.<br>The 128 possible authorization levels are distributed to 4 double words (authorization groups 1-4) with increasing value.<br><br>Indicates authorization level 32 - 63. |
| **[User administration] Current authorization group 3** | *UDINT* | Available authorization level for the user currently logged in to zenon. This information is displayed according to the bit encoding system of the user groups.<br>Authorization level 0 corresponds to decimal value 2^0 = 1<br>Authorization level 1 corresponds to decimal value 2^1 = 2<br>Authorization level 0 and 1 corresponds to decimal value 2^0 and 2^1 = 3<br>etc.<br>The 128 possible authorization levels are distributed to 4 double words (authorization groups 1-4) with increasing value.<br><br>Indicates authorization level 64 - 95. |
| **[User administration] Current authorization** | *UDINT* | Available authorization level for the user currently logged in to zenon. This information is displayed according to the |

| Name | Data type | Comment |
|---|---|---|
| **group 4** | | bit encoding system of the user groups.<br>Authorization level 0 corresponds to decimal value 2^0 = 1<br>Authorization level 1 corresponds to decimal value 2^1 = 2<br>Authorization level 0 and 1 corresponds to decimal value 2^0 and 2^1 = 3<br>etc.<br>The 128 possible authorization levels are distributed to 4 double words (authorization groups 1-4) with increasing value.<br><br>Indicates authorization level 96 - 127. |
| **[User Administration] User full name** | *STRING* | Displays the full name of the user currently logged in in zenon. |
| **[User Administration] User name** | *STRING* | Displays the user name of the user currently logged in in zenon. |
| **[User Administration] Days until password expires** | *DINT* | Displays the number of days until the password of the user currently logged in becomes invalid.<br><br>The variable has days as a time format. The time duration can be defined in zenon with the **Maximum duration in days** property.<br><br>**Note:** If the **Password never expires** option is activated in Active Directory or, in zenon, the **Maximum duration in days** property is set to *0*, then the value *2147483647* is written to the variable. |
| **[User Administration] Invalid user name** | *BOOL* | If the value of this variable is *1*, the login failed either because of an incorrect user name or because of an incorrect password. |
| **[User Administration] System lock** | *BOOL* | Current status of the system lock on the calling computer:<br>▸ *True* or *1*<br>System locked.<br>Possible causes of the lock: incorrect entry of the user identification.<br>**Note:** This block can be lifted again by the user logging in again with administrator rights.<br>▸ *False* or *0* |

| Name | Data type | Comment |
|---|---|---|
| | | System unlocked. Normal use possible. |
| **[User Administration] Error in changing password** | *BOOL* | Informs the user when a password failure occurs during the validation of the complexity. Both input errors via the user interface and the API are reported.<br>▸ *0*: No error occurred.<br>▸ *1*: Error occurred. It is not specified which error has occurred.<br>In the case of error, the variable switches from *0* to *1* and back again to *0*. This process happens every time there is an error. |
| **[User Administration] Error in requesting information from Active Directory** | *BOOL* | Informs the user when an error occurs during the request for information from Active Directory.<br>▸ *0*: No error occurred.<br>▸ *1*: Error occurred. It is not specified which error has occurred.<br>In the case of error, the variable switches from *0* to *1* and back again to *0*. This process happens every time there is an error. |
| **[User Administration] Expiration date of the logged in user** | *STRING* | Information on the remaning period of validity of an access authorization in the Runtime. If the value *>0* has been set for the **Notification of expiration time** property, the number of days remaining until the access data is no longer valid is shown when logging in. |

## 6.10 Theme - [Printer]

The following system driver variables are available for this subject area:

| Name | Data type | Comment |
|---|---|---|
| **[Printer] List printer - number of print jobs** | *UDINT* | Current number of waiting print jobs for the configured list printer. |
| **[Printer] List printer - name** | *STRING* | Name of the currently set list printer. |

| Name | Data type | Comment |
|---|---|---|
| **[Printer] List printer - status** | *UDINT* | Shows the current status of the list printer.<br>▸ If there is no error, the value of this variable is empty.<br>▸ In the event of an error, PRINTER_STATUS_ERROR is shown by the operating system.<br>**Note:** You configure the printer in the zenon Editor with the menu bar entry:<br>**File => General configuration => Standard**.<br>This configuration is applicable for the complete workspace. |
| **[Printer] Offline printer AML/CEL - number of print jobs** | *UDINT* | Current number of print jobs waiting for the configured offline printer AML/CEL. |
| **[Printer] Offline printer AML/CEL - name** | *STRING* | Name of the currently configured offline printer AML/CEL. |
| **[Printer] Offline printer AML/CEL - status** | *UDINT* | Shows the current status of the offline printer AML/CEL.<br>▸ If there is no error, the value of this variable is empty.<br>▸ In the event of an error, PRINTER_STATUS_ERROR is shown by the operating system.<br>**Note:** You configure the printer in the zenon Editor with the menu bar entry:<br>**File => General configuration => Standard**.<br>This configuration is applicable for the complete workspace. |
| **[Printer] Online printer on/off** | *BOOL* | Status of the online print administration of the Alarm Message List or the Chronological Event List.<br>0= off<br>1 = on |
| **[Printer] Report printer - Number of print jobs** | *UDINT* | Current number of waiting print jobs for the configured report printer. |
| **[Printer] Report printer - name** | *STRING* | Name of the currently set report printer. |
| **[Printer] Report printer** | *UDINT* | Shows the current status of the report printer. |

| Name | Data type | Comment |
|---|---|---|
| **- status** | | ▸ If there is no error, the value of this variable is empty.<br>▸ In the event of an error, PRINTER_STATUS_ERROR is shown by the operating system.<br>**Note:** You configure the printer in the zenon Editor with the menu bar entry:<br>**File => General configuration => Standard**.<br>This configuration is applicable for the complete workspace. |
| **[Printer] Screenshot printer - number of print jobs** | *UDINT* | Current number of waiting print jobs for the configured screenshot printer. |
| **[Printer] Screenshot printer - name** | *STRING* | Name of the currently configured screenshot printer. |
| **[Printer] Screenshot printer - status** | *UDINT* | Shows the current status of the screenshot printer.<br>▸ If there is no error, the value of this variable is empty.<br>▸ In the event of an error, PRINTER_STATUS_ERROR is shown by the operating system.<br>**Note:** You configure the printer in the zenon Editor with the menu bar entry:<br>**File => General configuration => Standard**.<br>This configuration is applicable for the complete workspace. |
| **[Printer] Who is printing online? AML/CEL** | *BOOL* | Shows for which module the online print is active.<br>0 = Alarm Message List<br>1 = Chronological Event List |

## 6.11 Theme - [Hardware resources]

The following system driver variables are available for this subject area:

| Name | Data type | Comment |
|---|---|---|
| **[HW resources] Free main memory [%]** | *UDINT* | Shows the free main memory of the current computer in |

| Name | Data type | Comment |
|---|---|---|
| | | percent. |
| **[HW resources] Free main memory [%] - Standby Server** | *UDINT* | Shows the free main memory on the standby server in percent. |
| **[HW resources] Free main memory [KB]** | *UDINT* | Shows the free main memory of the current computer in kilobytes. |
| **[HW resources] Free main memory [KB] - Standby Server** | *UDINT* | Shows the free main memory on the standby server in kilobytes. |
| **[HW resources] Free disk space - Database [%]** | *UDINT* | Shows the available disk space of the current computer in percent.<br>**Note:** This value always refers to the partition on which the Runtime folder of the project is located. |
| **[HW resources] Free disk space - Database [%] - Standby Server** | *UDINT* | Shows the free disk space on the standby server in percent.<br>**Note:** This value always refers to the partition on which the Runtime folder of the project is located. |
| **[HW resources] Free disk space - Database [KB]** | *UDINT* | Shows the free disk space of the current workstation in kilobytes.<br>**Note:** This value always refers to the partition on which the Runtime folder of the project is located. |
| **[HW resources] Free disk space - Database [KB] - Standby Server** | *UDINT* | Shows the free disk space on the standby server in kilobytes<br>**Note:** This value always refers to the partition on which the Runtime folder of the project is located. |
| **[HW resources] Free disk space - export [%]** | *UDINT* | Shows the free disk space of the export folder in percent.<br>**Note:** The export folder is configured in the project properties in the **File storage** property. |
| **[HW resources] Free disk space - export [%] - Standby Server** | *UDINT* | Shows the free disk space of the export folder in percent.<br>**Note:** The export folder is configured in the project properties in the **File storage** property. |
| **[HW resources] Free disk space - export [KB]** | *UDINT* | Shows the free disk space of the export folder in kilobytes.<br>**Note:** The export folder is configured in the project |

| Name | Data type | Comment |
|---|---|---|
| | | properties in the **File storage** property. |
| **[HW resources] Free disk space - export KB] - Standby Server** | *UDINT* | Shows the free disk space of the export folder on the standby server in kilobytes.<br>**Note:** The export folder is configured in the project properties in the **File storage** property. |

## 6.12 Theme - [network]

The following system driver variables are available for this subject area:

| Name | Data Type | Comment |
|---|---|---|
| **[Network] Current Primary Server** | *STRING*<br>*lokal* | Computer name of the current Primary Server<br>If the name was acquired from the host file, it will be the name used there. With DNS, this is the Fully Qualified Domain Name.<br>**Note:** If the network is deactivated, the variable sends the status INVALID. The **[Network] Current Standby Server** variable remains empty in contrast. |
| **[Network] Current Standby Server** | *STRING*<br>*lokal* | Computer name of the server which is currently not handling processes.<br>If the name was acquired from the host file, this is the name entered there. With DNS, this is the Fully Qualified Domain Name. |
| **[Network] Number of connected clients** | *UDINT* | Delivers the number of clients currently connected to the server. This number also includes the standby server, if there is one. |
| **[Network] Authorization denied** | *BOOL* | Shows whether a requested authorization is denied in the network. The value of this variable is changed only for a short time and then changed back to the initial state.<br>▸ *0* = operating authorization request accepted<br>▸ *1* = operating authorization request declined |

| Name | Data Type | Comment |
|---|---|---|
| **[Network] Authorization available** | *BOOL* | Shows whether there is an authorization for the current project on the local computer.<br>▸ 0 = No<br>▸ 1 = Yes |
| **[Network] operating authorization: Computer that has it** | *STRING* | Shows the name of the computer that has the authorization for the currently loaded project. |
| **[Network] Evaluation result of Server 1** | *UDINT* | In the event of changes to a variable from the evaluation matrix, this value is written to the corresponding system driver variable for **Server 1** and **Server 2** after calculation of the new result of the evaluation. The values are equal to one another (server <-> standby), so that the current value is always displayed on both sides. However, after the other side has a failure, this value remains for the attendant variable and only updates itself once it reconnects.<br>**Note:** You can find further information on evaluation in the Network manual in the Configuration of redundancy evaluation chapter. |
| **[Network] Evaluation result of Server 2** | *UDINT* | In the event of changes to a variable from the evaluation matrix, this value is written to the corresponding system driver variable for **Server 1** and **Server 2** after calculation of the new result of the evaluation. The values are equal to one another (server <-> standby), so that the current value is always displayed on both sides. However, after the other side has a failure, this value remains for the attendant variable and only updates itself once it reconnects.<br>**Note:** You can find further information on evaluation in the Network manual in the Configuration of redundancy evaluation chapter. |
| **[Network] Names of connected clients** | *STRING* | xxx Delivers the names of the clients currently connected to the server. The standby server, if there is one, is also included. |

| Name | Data Type | Comment |
|---|---|---|
| **[Network] Primary Server <-> Standby Server in data sync** | *BOOL* | A binary variable that takes the value *1* (for a short time) when the system performs a redundancy switch between server and standby server.<br>▸ *0 = no file sync*<br>▸ *1 = file sync active* |
| **[Network] Primary Server broke down** | *BOOL*<br><br>*lokal* | Indicates that the connection to the process handling server was lost.<br>Depending on the network position of the computer, this means:<br>▸ Dominant Server: While it is not yet the process handling server, the value changes to TRUE if the connection to the process handling server is lost. Always FALSE after synchronization.<br>▸ Non-dominant Server: Changes to TRUE if the connection to the dominant server, which was the process handling server, is lost. Changes back to FALSE if the Standby Server was promoted to be the Primary Server. EVALUATION: Preferably via a reaction matrix (REMA), as the Alarm Management is also swapped and taken over by the SB at that time. The Online Container is also not suitable because the variables are re-initialized during redundancy switching.<br>Client: Changes to TRUE if the connection to the process handling server is lost. Changes back to FALSE if the client connects to the SB computer that is now the process handling server. |
| **[Network] Primary Server shut down** | *BOOL*<br><br>*lokal* | Indicates the regular stop of the process handling server.<br>The value changes to TRUE if the Primary Server was stopped properly. FALSE if there is a process handling server in the net.<br>Depending on the network position of the computer, this means:<br>▸ Dominant Server: While it is not yet the process handling server, the value changes to TRUE if |

| Name | Data Type | Comment |
|---|---|---|
| | | the process handling server has stopped.<br>▸ Non-dominant Server: Changes to TRUE if the dominant server, which was the process handling server, has stopped. Changes back to FALSE if the StandBy was promoted to be the process handling server.<br>▸ EVALUATION: Preferably via a reaction matrix (REMA), as the Alarm Management is also swapped and taken over by the SB at that time. The Online Container is also not suitable because the variables are re-initialized during redundancy switching.<br>▸ Client: Changes to TRUE if the dominant server has stopped. Changes back to FALSE if the client connects to the SB computer that is now the process handling server.<br>Is also TRUE while the process handling non-dominant server changes back to be the non-process handling server. |
| **[Network] Standalone/Primary Server/Standby Server/Client** | *DINT* | Shows the type of the local computer in the network.<br>▸ *-1* = Standalone<br>▸ *0* = Client<br>▸ *1* = Primary Server<br>▸ *2* = Standby Server |
| **[Network] Standby Server broke down** | *BOOL* | Changes to TRUE if the connection to the currently non-process handling server is terminated unexpectedly. If there is a connection, the value is FALSE.<br>Depending on the network position of the computer, this means:<br>▸ Dominant Server: The variable only acts as described from the time when the standby became the server handling the process.<br>▸ Non-dominant Server: If, during file synchronization, the connection to a server that is dominant but is not handling the process is |

| Name | Data Type | Comment |
|---|---|---|
| | | interrupted, the value changes to TRUE. Always FALSE if not the server handling the process.<br>▸ Client: As per server handling the process. |
| **[Network] Standby Server shut down** | *BOOL* | Is TRUE on the process handling server, if the non-process handling server was stopped properly and if there is no connection anymore. Changes to FALSE if the non-process handling server has registered at the process handling server.<br>Depending on the network position of the computer, this means:<br>▸ Dominant Server: Only from the time when the standby became the server handling the process does the variable act as described.<br>▸ Non-dominant Server: If this is ended during file synchronization with a server that is dominant but is not handling the process, the value changes to TRUE. Always FALSE if not the server handling the process.<br>▸ Client: As per server handling the process. |
| **[Network] Standby Server started** | *BOOL* | Is TRUE if the non-Primary Server has signed into the Primary Server, the file sync was carried out and the connection between the two computers is active.<br>Depending on the network position of the computer, this means:<br>▸ Dominant Server: Only from the time when the standby became the server handling the process does the variable act as described.<br>▸ Non-dominant Server: Becomes TRUE if the dominant server not handling the process starts. Changes to FALSE if the computer is the server handling the process.<br>▸ Client: As per server handling the process. |
| **[Network] Timeout [ms]** | *UDINT* | Shows the timeout in milliseconds for the zenon network as configured in the project configuration. |

| Name | Data Type | Comment |
|---|---|---|
| **[Network] Switch from Primary Server to Standby Server** | *BOOL* | A binary variable that takes on the value 1 if the server becomes the standby server during a redundancy switch.<br>▸ *0*= registered server is available as server in the network.<br>▸ *1* = registered server is available as standby server in the network. |
| **[Network] Switch from Standby Server to Primary Server** | *BOOL* | A binary variable that takes on the value 1 if the standby server becomes the server during a redundancy switch.<br>▸ *0* = registered Standby Server is available as standby server in the network.<br>▸ *1* = registered Standby Server is available as server in the network. |

## 6.13 Theme - [Folder]

The following system driver variables are available for this subject area:

| Name | Data Type | Comment |
|---|---|---|
| **[Folder] Database** | *STRING* | Visualizes the path of the database for the active project. |
| **[Folder] Export** | *STRING* | Visualizes the path of the configured export folder.<br>**Note:** The export folder is configured in the project settings **General**, in the **File storage** property in the **Name/Folder** properties group. |
| **[Folder] Graphics** | *STRING* | Visualizes the folder for the graphics of the active project that were inserted via the project tree.<br>Graphics are administered in the project tree, in the **Files** node in the **Graphics** subfolder.<br>**Note:** The graphics folder is configured in the **General** project settings, in the **File storage** property in the **Name/Folder** properties group. |

| Name | Data Type | Comment |
|---|---|---|
| **[Folder] Lists** | *STRING* | Visualizes the path for lists. |
| **[Folder] Reports** | *STRING* | Visualizes the path for report files that are configured in zenon. |
| **[Folder] Video** | *STRING* | Visualizes the path for multimedia files.<br>Videos are administered in the project tree, in the **Files** node in the **Multimedia** subfolder. |

## 6.14 Theme - [Performance Statistics Network]

The following system driver variables are available for this subject area:

| Name | Data type | Comment |
|---|---|---|
| **[Network statistics] Number of received packets** | *UDINT* | Accumulated number of received network packets.<br>Initialization of the counter with **Write set value**. |
| **[Network statistics] Number of received packets (local)** | *UDINT* | Accumulated number of locally received network packets.<br>Initialization of the counter with **Write set value**. |
| **[Network statistics] Number of received packets per second, current** | *UDINT* | Current number of received network packets per second.<br>Initialization of minimum and maximum with **Write set value**. |
| **[Network statistics] Number of received packets per second, current (local)** | *UDINT* | Current number of locally received network packets per second.<br>Initialization of minimum and maximum with **Write set value**. |
| **[Network statistics] Number of received packets per second, maximum** | *UDINT* | Current maximum number of received network packets per second. |
| **[Network statistics]** | *UDINT* | Current maximum number of locally received network |

| Name | Data type | Comment |
|---|---|---|
| **Number of received packets per second, maximum (local)** | | packets per second. |
| **[Network statistics] Number of received packets per second, minimum** | *UDINT* | Current minimum number of received network packets per second. |
| **[Network statistics] Number of received packets per second, minimum (local)** | *UDINT* | Current minimum number of locally received network packets per second. |
| **[Network statistics] Number of sent packets** | *UDINT* | Accumulated number of sent network packets.<br>Initialization of the counter with **Write set value**. |
| **[Network statistics] Number of sent packets (local)** | *UDINT* | Accumulated number of locally sent network packets. Initialization of the counter with **Write set value**. |
| **[Network statistics] Number of sent packets per second, current** | *UDINT* | Current number of sent network packets per second.<br>Initialization of minimum and maximum with **Write set value**. |
| **[Network statistics] Number of sent packets per second, current (local)** | *UDINT* | Current number of locally sent network packets per second.<br>Initialization of minimum and maximum with **Write set value**. |
| **[Network statistics] Number of sent packets per second, maximum** | *UDINT* | Current maximum number of sent network packets per second. |
| **[Network statistics] Number of sent packets per second, maximum (local)** | *UDINT* | Current maximum number of locally sent network packets per second. |
| **[Network statistics] Number of sent packets per second, minimum** | *UDINT* | Current minimum number of sent network packets per second. |
| **[Network statistics] Number of sent packets per second, minimum** | *UDINT* | Current minimum number of locally sent network packets per second. |

| Name | Data type | Comment |
|---|---|---|
| **(local)** | | |
| **[Network statistics] Pending messages (total)** | *UDINT* | Shows the currently-pending messages in the Windows queue (Message Queue) for all projects configured in zenon. |
| **[Network statistics] Pending messages (project)** | *UDINT* | Shows the currently-pending messages in the Windows queue (Message Queue) for the current project. |
| **[Network statistics] Processing time of received packets, maximum [µs]** | *UDINT* | Maximum processing duration for received network packets. |
| **[Network statistics] Processing time of received packets, maximum [µs] (local)** | *UDINT* | Maximum processing duration for locally received network packets. |
| **[Network statistics] Processing time of received packets, minimum [µs]** | *UDINT* | Minimum of the processing duration for received network packets. |
| **[Network statistics] Processing time of received packets, minimum [µs] (local)** | *UDINT* | Minimum of the processing duration for locally received network packets. |
| **[Network statistics] Processing time of received packets, average [µs]** | *UDINT* | Average of the processing duration for received network packets.<br>Initialization of minimum and maximum with **Write set value**. |
| **[Network statistics] Processing time of received packets, average [µs] (local)** | *UDINT* | Average of the processing duration for locally received network packets.<br>Initialization of minimum and maximum with **Write set value**. |
| **[Network statistics] Size of received packets [byte]** | *UDINT* | Accumulated size of received network packets.<br>Initialization of the counter with **Write set value**. |
| **[Network statistics] Size of received packets [byte]** | *UDINT* | Accumulated size of locally received network packets. Initialization of the counter with **Write set value**. |

| Name | Data type | Comment |
|---|---|---|
| **(local)** | | |
| **[Network statistics] Size of received packets per second, current [byte]** | *UDINT* | Current size of received network packets per second.<br>Initialization of minimum and maximum with **Write set value**. |
| **[Network statistics] Size of received packets per second, current [byte] (local)** | *UDINT* | Current size of locally received network packets per second.<br>Initialization of minimum and maximum with **Write set value**. |
| **[Network statistics] Size of received packets per second, maximum [byte]** | *UDINT* | Current maximum size of received network packets per second. |
| **[Network statistics] Size of received packets per second, maximum [byte] (local)** | *UDINT* | Current maximum size of locally received network packets per second. |
| **[Network statistics] Size of received packets per second, minimum [byte]** | *UDINT* | Current minimum size of received network packets per second. |
| **[Network statistics] Size of received packets per second, minimum [byte] (local)** | *UDINT* | Current minimum size of locally received network packets per second. |
| **[Network statistics] Size of sent packets [byte]** | *UDINT* | Accumulated size of sent network packets.<br>Initialization of the counter with **Write set value**. |
| **[Network statistics] Size of sent packets [byte] (local)** | *UDINT* | Accumulated size of locally sent network packets.<br>Initialization of the counter with **Write set value**. |
| **[Network statistics] Size of sent packets per second, current [byte]** | *UDINT* | Current size of sent network packets per second.<br>Initialization of minimum and maximum with **Write set value**. |
| **[Network statistics] Size of sent packets per second, current [byte] (local)** | *UDINT* | Current size of locally sent network packets per second.<br>Initialization of minimum and maximum with **Write set value**. |
| **[Network statistics] Size of sent packets per second,** | *UDINT* | Current maximum size of sent network packets per |

| Name | Data type | Comment |
|---|---|---|
| **maximum [byte]** | | second. |
| **[Network statistics] Size of sent packets per second, maximum [byte] (local)** | *UDINT* | Current maximum size of locally sent network packets per second. |
| **[Network statistics] Size of sent packets per second, minimum [byte]** | *UDINT* | Current minimum size of sent network packets per second. |
| **[Network statistics] Size of sent packets per second, minimum [byte] (local)** | *UDINT* | Current minimum size of locally sent network packets per second. |

## 6.15 Theme - [Performance] Statistics Driver

The following system driver variables are available for this subject area:

| Name | Data type | Comment |
|---|---|---|
| **[Driver statistics] Number of received values per second, current** | *UDINT* | Current number of received values per second.<br>Initialization of minimum and maximum with **Write set value**. |
| **[Driver statistics] Number of received values per second, current (local)** | *UDINT* | Current number of locally received values per second.<br>Initialization of minimum and maximum with **Write set value**. |
| **[Driver statistics] Number of received values per second, maximum** | *UDINT* | Current maximum number of received values per second. |
| **[Driver statistics] Number of received values per second, maximum (local)** | *UDINT* | Current maximum number of locally received values per second. |
| **[Driver statistics] Number of received values per second, minimum** | *UDINT* | Current minimum number of received values per second. |
| **[Driver statistics] Number of received values per second, minimum (local)** | *UDINT* | Current minimum number of locally received values per second. |

| Name | Data type | Comment |
|---|---|---|
| **[Driver statistics] Number of received value lists per second, current** | *UDINT* | Current number of received value lists per second.<br>Initialization of minimum and maximum with **Write set value**. |
| **[Driver statistics] Number of received value lists per second, current (local)** | *UDINT* | Current number of locally received value lists per second.<br>Initialization of minimum and maximum with **Write set value**. |
| **[Driver statistics] Number of received value lists per second, maximum** | *UDINT* | Current maximum number of received value lists per second. |
| **[Driver statistics] Number of received value lists per second, maximum (local)** | *UDINT* | Current maximum number of locally received value lists per second. |
| **[Driver statistics] Number of received value lists per second, minimum** | *UDINT* | Current minimum number of received value lists per second. |
| **[Driver statistics] Number of received value lists per second, minimum (local)** | *UDINT* | Current minimum number of locally received value lists per second. |
| **[Driver statistics] Number of sent requests** | *UDINT* | Cumulated number of sent requests.<br>Initialization of minimum and maximum with **Write set value**. |
| **[Driver statistics] Number of sent requests (local)** | *UDINT* | Cumulated number of locally sent requests.<br>Initialization of minimum and maximum with **Write set value**. |
| **[Driver statistics] Number of sent set values** | *UDINT* | Accumulated number of sent set-values.<br>Initialization of minimum and maximum with **Write set value**. |
| **[Driver statistics] Number of sent set values (local)** | *UDINT* | Cumulated number of sent set-values.<br>Initialization of minimum and maximum with **Write set value**. |
| | | |

| Name | Data type | Comment |
|---|---|---|
| **[Driver statistics] Processing time of received values, maximum [µs]** | *UDINT* | Maximum value of processing duration for received values. |
| **[Driver statistics] Processing time of received values, maximum [µs] (local)** | *UDINT* | Maximum value of processing duration for locally received values. |
| **[Driver statistics] Processing time of received values, minimum [µs]** | *UDINT* | Minimum value of processing duration for received values. |
| **[Driver statistics] Processing time of received values, minimum [µs] (local)** | *UDINT* | Minimum value of processing duration for locally received values. |
| **[Driver statistics] Processing time of received values, average [µs]** | *UDINT* | Average value of processing duration for received values.<br>Initialization of minimum and maximum with **Write set value**. |
| **[Driver statistics] Processing time of received values, average [µs] (local)** | *UDINT* | Average value of processing duration for locally received values.<br>Initialization of minimum and maximum with **Write set value**. |
| | | |
| **[Driver statistics] Processing time of received value lists, average [µs] (local)** | *UDINT* | Average value of processing duration for locally received value lists.<br>xxx |
| **[Driver statistics] Processing time of received value lists, maximum [µs]** | *UDINT* | Maximum value of the processing duration for received value lists. |
| **[Driver statistics] Processing time of received value lists, maximum [µs] (local)** | *UDINT* | Maximum value of processing duration for locally received value lists. |
| **[Driver statistics]** | *UDINT* | Minimum value of the processing duration for received |

| Name | Data type | Comment |
|---|---|---|
| **Processing time of received value lists, minimum [µs]** | | values. |
| **[Driver statistics] Processing time of received value lists, minimum [µs] (local)** | *UDINT* | Minimum value of processing duration for locally received value lists. |
| **[Driver statistics] Processing time of received value lists, average [µs]** | *UDINT* | Average value of the editing time for received value lists. Writing the set value initializes counter, minimum and maximum. |

## 6.16 Theme - [Project information]

The following system driver variables are available for this subject area:

| Name | Data type | Comment |
|---|---|---|
| **[Project summary] Number of "Screen: Return to last" actions** | *UDINT* | Displays the number of possible "Screen: Return to last" actions. These can be configured in the zenon Editor with the **Screen: Return to last** property. |
| **[Project summary] Number of reports in the background** | *UDINT* | Shows how many reports are currently executed in the memory of zenon. The reports are initiated via the function administration. |
| **[Project summary] Save resolution-dependent screens active/inactive** | *BOOL* | Status of the **SERIALIZE** option in *zenon6.ini*<br>▸ 0 = entry *SERIALIZE = 0*<br>▸ 1 = entry *SERIALIZE = 1* |
| **[Project summary] Blinking interval [ms]** | *UDINT* | Shows the currently-configured time for the blinking intervals for displaying limit value violations.<br>The blinking intervals can be configured in the zenon Editor with the **Flash freq. [tenth sec]** property in the **Graphical design** properties group. |
| **[Project summary] Wrong input for set value** | *BOOL* | Display whether the set value input fails due to an invalid value.<br>▸ 0 = Set value input OK |

| Name | Data type | Comment |
|---|---|---|
| | | ▸ 1 = Set value input unsuccessful<br><br>The change to 1 only happens for a short moment and can be used for a reaction matrix, as a trigger for a function, to trigger an alarm or to color certain elements.<br><br>The value changes if a value higher or lower than the one set by an element or a screen of type **Keyboard** is entered.<br><br>If the value is changed successfully using the **Write set value** dialog, no value change takes place and the user is informed about the invalid value change by a dialog. |
| **[Project summary] Functions on/off** | *BOOL* | Shows the current status of the zenon function administration.<br>▸ 0 = Function administration is inactive<br>▸ 1 = Function administration is active |
| **[Project summary] Function logging active/inactive** | *BOOL* | Displays whether function logging is activated for the current project. All locally executed functions are written into a LOG file.<br>▸ 0 = Function logging is deactivated<br>▸ 1 = Function logging is activated |
| **[Project summary] No authorization to execute function** | *BOOL* | Indicates whether the execution of an action (Set value, Execute function) is tried for which the current user does not have the required authorization.<br>▸ 0 = Action execution permitted<br>▸ 1 = Action execution not permitted |
| **[Project summary] Type of control system (SICAM 230/zenon** | *UDINT* | Shows the version of Runtime that is currently in use.<br>▸ 3 = zenon<br>▸ 1 = SICAM 230 |
| **[Project summary] Project name** | *STRING* | Shows the name of the active project in zenon. |
| **[Project summary] Project version** | *STRING* | Displays project version. |

| Name | Data type | Comment |
|---|---|---|
| **[Project summary] Send message active** | *BOOL* | Displays whether function Send message is active.<br>▸ 0 = Send message function inactive<br>▸ 1 = Send message function active |
| **[Project summary] Serial number** | *STRING* | Shows licensed zenon serial number for the computer. |
| **[Project summary] Set value input: Current set point input** | *STRING* | Displays the current value of the set value input in screen Keyboard.<br>With this you can check while screen Keyboard is open whether the entered value lies within the limits or whether the value is correct which was entered via screen specific function *Display value as text* or the function *Set point input for keyboard screen*. |
| **[Project summary] Set value: Limit for maximum** | *STRING* | Upper limit for set value input for the currently selected variable |
| **[Project summary] Set value: Limit for minimum** | *STRING* | Lower limit for set value input for the currently selected variable. |
| **[Project summary] Variable for last set point input** | *STRING* | Displays the name of the variable with the last successful set value action. |
| **[Project summary] Variable for set point input** | *STRING* | Displays the name of the variable that is currently open for the set value action. |
| **[Project summary] Runtime files version** | *STRING* | Shows the zenon version, for which the current project was created. |
| **[Project summary] Last opened screen** | *STRING* | Shows the name of the last open screen in zenon. The selection of the frames which are considered at this takes place in property **Main frames** in the project manager (**Graphical design**, **Runtime general**).<br>**Note:** If a frame is renamed, this dialog must be added again in the dialog to select the main frames. Otherwise screens of the variable that are based on this frame cannot be renamed. |

## 6.17 Theme [Process Recorder]

The content of the variables is project-specific in hardware mode. In simulation or in playback mode, the content of the variables is always identical throughout all projects.

System driver variables of this theme cannot be recorded and are always supplied with current values from the Process Recorder module in the Runtime.

The following system driver variables are available for this subject area:

| Name | Data type | Comment |
|---|---|---|
| **[Process Recorder] Playback period start** | *UDINT* | Start of the playback period for Process Recorder playback.<br>**Note:** If Runtime is running in hardware mode, the value of this system variable is always *0*. |
| **[Process Recorder] Playback period end** | *UDINT* | End of the playback period for Process Recorder playback.<br>**Note:** If Runtime is running in hardware mode, the value of this system variable is always *0*. |
| **[Process Recorder] Recorder mode** | *UDINT* | Visualizes the current status of the Process Recorder module in Runtime.<br>▸ *0*<br>Runtime runs in hardware mode and the Process Recorder module is not active.<br>The value *0* is set when Runtime is started or reloaded if the **Activate Process Recorder** project property is not active.<br>▸ *1*<br>Runtime runs in hardware mode and the Process Recorder module is active.<br>The value *1* is set when Runtime is started or reloaded if the **Activate Process Recorder** project property is active.<br>▸ *2*<br>Runtime runs in simulation mode and the playback mode of the Process Recorder is not active.<br>▸ *3*<br>Runtime runs in simulation mode and the playback mode of the Process Recorder is |

| Name | Data type | Comment |
|---|---|---|
| | | active.<br>▸ *4*<br>Runtime runs in simulation mode and the Process Recorder module has been started in playback mode automatically. In doing so, the playback mode was automatically started by executing a correspondingly-configured zenon function. |
| **[Process Recorder] State evacuation path** | *UDINT* | Visualizes the current status of the evacuation of the files of the Process Recorder module to the client or the server.<br>▸ *0*<br>Evacuation is deactivated<br>▸ *1*<br>Evacuation is activated Configured path is valid.<br>▸ *2*<br>Evacuation failed. Configured path is incorrect.<br>The system driver variable is only updated after an evacuation has been carried out. |
| **[Process Recorder] Status evacuation path - Standby Server** | *UDINT* | Visualizes the current status of the evacuation of the files of the Process Recorder module to the standby server.<br>▸ *0*<br>Evacuation is deactivated<br>▸ *1*<br>Evacuation is activated Configured path is valid.<br>▸ *2*<br>Evacuation failed. Configured path is incorrect.<br>The system driver variable is only updated after an evacuation has been carried out. |

## 6.18 Theme [Recipes: Standard and RGM]

The following system driver variables are available for this subject area:

### RGM GENERAL INFORMATION

| Variable | Data type | Description |
|---|---|---|
| **[Recipes: Standard and RGM] Standard recipe/RGM recipe function in progress (global/local)** | *DINT* | States that an RGM function (including RGM screen functions) is being executed or has been ended:<br>▸ *-1*: is being executed<br>▸ *0*: Initialization value read successfully<br>▸ *1*: Error: User has no authorization<br>▸ *2*: Error: No authorization in the network<br>▸ *3*: Error: Cancellation by the user<br>▸ *4*: Error: Error - could not read everything successfully, e.g.<br>- Communication with the hardware is interrupted before read was started<br>- a data block is not available on the PLC<br>- Error during transmission<br>▸ *5*: Error: Error during save of the recipe file<br>▸ *6*: Function cancelled via VBA |
| **[Recipes: Standard and RGM] Last set filter (global/local)** | *STRING* | Saves the last filter used for the recipe value value list. |
| **[Recipes: Standard and RGM] Import result XML (global/local)** | *DINT* | Displays if the import is currently active and whether the import was concluded with or without errors.<br>The variable is assigned at the start and the end of the import. In the event of an error occurring, the error number of the first error that occurred is set after the import |

| Variable | Data type | Description |
|---|---|---|
| | | has ended. In addition, all errors that have occurred can be viewed in the CEL with additional information, such as the recipe concerned.<br><br>These error numbers also apply for the RGM feedback variable **Import result**. The values are written to the defined variables at the start and end of the import of the respective recipe groups.<br><br>**General messages:**<br>▸ *0*: Undefined status (no import has been carried out yet)<br>▸ *1*: Import was started and is currently in progress<br>▸ *2*: Import was concluded without an error<br><br>**General error:**<br>▸ *3*: No file selected.<br>▸ *4*: Unknown XML-structure<br>▸ 5: Import file is not present.<br>▸ 6: The export file does already exist and should not be overwritten.<br>▸ 7: The writing of the export file was unsuccessful.<br>▸ 19: General error with text description.<br><br>(8 - 18: not in use)<br><br>**RGM-specific error:**<br>▸ *20*: A new recipe could not be created.<br>▸ *21*: The settings of a recipe cannot be imported (for example, timeout for synchronous writing, ...).<br>▸ *22*: The RGM data could not be |

| Variable | Data type | Description |
|---|---|---|
| | | accessed.<br>▸ *23*: A new recipe group could not be created.<br>▸ *24*: The variables or recipes of a recipe group cannot be imported correctly.<br>▸ *25*: Group selection is missing for the import of an individual recipe.<br>▸ *26*: The recipe group selected for the import of individual recipes is not present.<br>▸ *27*: Error when creating variables in the group.<br>▸ *28*: Error when importing the recipe group settings (comments, for example).<br>▸ *29*: Error when importing the variable settings (the minimum and maximum value, for example).<br>▸ *30*: The recipe group could not be imported.<br>▸ *31*: The data of the selected recipe group for the import of individual recipes could not be loaded. |

### LAST RECIPE WRITTEN

In addition to the normal RGM actions, there are separate system driver variables for reading and writing for the graphical recipe variables. These system variables contain identical values to **last recipe written** (write shadow variable) and **last recipe read** (read graphical recipe variable).

| Variable | Data type | Description |
|---|---|---|
| **[Recipes: Standard and RGM] Standard recipe /RGM recipe completely written** | UDINT | Variable receives the value *0* as long as a recipe is written locally. Value becomes *1* if the recipe has been completely written. |

| Variable | Data type | Description |
|---|---|---|
| **(global/local)**<br>- - - - - - - - - - - - - - - -<br>**[Recipes: Standard and RGM] RGM write graphic recipe variables - result (global/local)** | | After starting the Runtime, the variable also has the value *0*.<br>Values for write operation.<br>▸ 0: Initialization value before writing the recipe.<br>▸ 1: Writing was completed successfully and has ended.<br>▸ 2: Writing was not carried out due to a general error.<br>▸ 3: Writing was executed incorrectly and has ended.<br>▸ 4: Wait for *ready*.<br>▸ 5: Write terminated, for example because Runtime has been ended.<br>▸ 6: Writing was incorrect because a timeout occurred.<br>▸ 7: Writing was not carried out because of an interlocking condition.<br>▸ 8: Writing was not carried out because the recipe contains invalid values. |
| **[Recipes: Standard and RGM] Last written standard recipe/RGM recipe (lglobal/ocal)**<br>- - - - - - - - - - - - - - - -<br>**[Recipes: Standard and RGM] RGM write graphic recipe variables - recipe name (global/local)** | STRING | Displays the name of the last standard recipe/RGM recipe sent globally or locally. |
| **[Recipes: Standard and RGM] Last written recipe group (global/local)**<br>- - - - - - - - - - - - - - - -<br>**[Recipes: Standard and RGM] RGM write graphic recipe variables - recipe group name (global/local)** | STRING | Displays the name of the last recipe group sent of the last recipe sent. |
| **[Recipes: Standard and RGM] Last** | UDINT | Shows the recipe number of the last RGM |

| Variable | Data type | Description |
|---|---|---|
| **written RGM recipe number (global/local)**<br><br>**- - - - - - - - - - - - - - - -**<br><br>**[Recipes: Standard and RGM] RGM write graphic recipe variables - recipe number (global/local)** | | recipe sent, globally or locally |
| **[Recipes: Standard and RGM] RGM last written recipe - authorization (global/local)**<br><br>**- - - - - - - - - - - - - - - -**<br><br>**[Recipes: Standard and RGM] RGM write graphic recipe variables - authorization (global/local)** | DINT | Authorization level of the last recipe written. |
| **[Recipes: Standard and RGM] RGM last written recipe - operator, last change (global/local)**<br><br>**- - - - - - - - - - - - - - - -**<br><br>**[Recipes: Standard and RGM] RGM write graphic recipe variables - operator, last change (global/local)** | STRING | Name of the user who was logged in when the last change was made to the last recipe written. |
| **[Recipes: Standard and RGM] RGM last written recipe - comment 1 to 8 (global/local)**<br><br>**- - - - - - - - - - - - - - - -**<br><br>**[Recipes: Standard and RGM] RGM write graphic recipe variable - comment 1 to 8 (global/local)** | STRING | Eight comments can be added to a recipe. The variable contains the comment of the respective number for the last recipe sent. |
| **[Recipes: Standard and RGM] RGM last written recipe - recipe status (global/local)**<br><br>**- - - - - - - - - - - - - - - -**<br><br>**[Recipes: Standard and RGM] RGM write graphic recipe variables - recipe status (global/local)** | DINT | Status of the last recipe written as a number. |
| **[Recipes: Standard and RGM] RGM last written recipe - recipe status text** | STRING | Status of the last recipe sent as text in **1 -** |

| Variable | Data type | Description |
|---|---|---|
| **(global/local)**<br><br>**- - - - - - - - - - - - - - - -**<br><br>**[Recipes: Standard and RGM] RGM write graphic recipe variables - recipe status text (global/local)** | | **@Text** format. |
| **[Recipes: Standard and RGM] RGM last written recipe - recipe version (global/local)**<br><br>**- - - - - - - - - - - - - - - -**<br><br>**[Recipes: Standard and RGM] RGM write graphic recipe variables - recipe version (global/local)** | DINT | Version of the last recipe written. |
| **[Recipes: Standard and RGM] RGM last written recipe - time, last change (global/local)**<br><br>**- - - - - - - - - - - - - - - -**<br><br>**[Recipes: Standard and RGM] RGM write graphic recipe variable - time, last change (global/local)** | *STRING* | Time of the last recipe change of the last recipe written. |

## LAST RECIPE READ

In addition to the normal RGM actions, there are separate system driver variables for reading and writing for the graphical recipe variables. These system variables contain identical values to **last recipe written** (write shadow variable) and **last recipe read** (read graphical recipe variable).

| Variable | Data type | Description |
|---|---|---|
| **[Recipes: Standard and RGM] Standard recipe/RGM recipe all values completely read (global/local)**<br><br>**- - - - - - - - - - - - - - - -**<br><br>**[Recipes: Standard and RGM] RGM read graphic recipe variables - result (global/local)** | *UDINT* | After the recipe has been read, this variable contains the result of the operation. Possible variable values:<br>▸ *0*: Set before the reading and only changes when the reading process is done.<br>▸ 1: Finished reading successfully.<br>▸ 2: During reading an error not defined in greater detail has |

| Variable | Data type | Description |
|---|---|---|
| | | occurred.<br>▸ 3: During readnig at least one variable hat status INVALID.<br>▸ 4: At least on value is not within the min-max limits.<br>▸ 5: During reading a timeout (30000 + 100*VarCount in [ms]) occurred. |
| **[Recipes: Standard and RGM] RGM last read recipe - authorization (global/local)**<br>- - - - - - - - - - - - - - - -<br>**[Recipes: Standard and RGM] RGM read graphic recipe variables - authorization (global/local)** | *DINT* | Level of authorization of the last recipe read. |
| **[Recipes: Standard and RGM] RGM last read recipe - operator, last change (global/local)**<br>- - - - - - - - - - - - - - - -<br>**[Recipes: Standard and RGM] RGM read graphic recipe variables - operator, last change (global/local)** | *STRING* | Name of the user who was logged in when the last change was made to the last recipe read. |
| **[Recipes: Standard and RGM] RGM last recipe read - comment 1 to 8 (global/local)**<br>- - - - - - - - - - - - - - - -<br>**[Recipes: Standard and RGM] RGM read graphic recipe variable - comment 1 to 8 (global/local)** | *STRING* | Eight comments can be added to a recipe. The variable contains the comment of the respective number for the last recipe read. |
| **[Recipes: Standard and RGM] RGM last read recipe - recipe group name (global/local)**<br>- - - - - - - - - - - - - - - -<br>**[Recipes: Standard and RGM] RGM read graphic recipe variables - recipe group name (global/local)** | *STRING* | Name of the recipe group name of the recipe read last. |

| Variable | Data type | Description |
|---|---|---|
| **[Recipes: Standard and RGM] RGM last read recipe - recipe name (global/local)**<br>- - - - - - - - - - - - - - - -<br>**[Recipes: Standard and RGM] RGM read graphic recipe variables - recipe name (global/local)** | *STRING* | Name of the recipe read last. |
| **[Recipes: Standard and RGM] RGM last read recipe - recipe number (global/local)**<br>- - - - - - - - - - - - - - - -<br>**[Recipes: Standard and RGM] RGM read graphic recipe variables - recipe number (global/local)** | *DINT* | Number of the recipe read last. |
| **[Recipes: Standard and RGM] RGM last read recipe - recipe status (global/local)**<br>- - - - - - - - - - - - - - - -<br>**[Recipes: Standard and RGM] RGM read graphic recipe variables - recipe status (global/local)** | *DINT* | Status of the last recipe read as a number. |
| **[Recipes: Standard and RGM] RGM last recipe read - recipe status text (global/local)**<br>- - - - - - - - - - - - - - - -<br>**[Recipes: Standard and RGM] RGM read graphic recipe variables - recipe status text (global/local)** | *STRING* | Status of the last recipe read as text in **1-Text** format. |
| **[Recipes: Standard and RGM] RGM last recipe read - recipe version (global/local)**<br>- - - - - - - - - - - - - - - -<br>**[Recipes: Standard and RGM] RGM read graphic recipe variables - recipe version (global/local)** | *DINT* | Version of the last recipe read. |

| Variable | Data type | Description |
|---|---|---|
| **[Recipes: Standard and RGM] RGM last recipe read - time, last change (global/local)**<br>- - - - - - - - - - - - - - - -<br>**[Recipes: Standard and RGM] RGM read graphic recipe variables - time, last change (global/local)** | *STRING* | Time of the last recipe change of the last recipe read. |

### LAST RECIPE SELECTED

If several RGM screens are opened at the same time, the values of the last recipe selection are always taken.

| Variable | Data type | Description |
|---|---|---|
| **[Recipes: Standard and RGM] RGM last selected recipe - authorization (local)** | *DINT* | Contains the level of authorization of the last selected recipe as a number. |
| **[Recipes: standard and RGM] RGM last recipe selected - operator, last change (local)** | *STRING* | Contains the name of the user that made the last change to the last selected recipe. |
| **[Recipes: Standard and RGM] RGM last selected recipe - group name (local)** | *STRING* | Contains the name of the group recipe of the last selected recipe. |
| **[Recipes: Standard and RGM] RGM last selected recipe - comment 1 to 8 (local)** | *STRING* | Eight comments can be added to a recipe. The variable contains the comment of the respective number for the last recipe selected. |
| **[Recipes: Standard and RGM] RGM last selected recipe - recipe name (local)** | *STRING* | Contains the name of the last selected recipe. |
| **[Recipes: Standard and RGM] RGM last selected recipe - recipe number (local)** | *DINT* | Contains the recipe number of the last selected recipe. |
| **[Recipes: Standard and RGM] RGM last selected recipe - recipe status (local)** | *DINT* | Contains the status of the last selected recipe as a number. |

| Variable | Data type | Description |
|---|---|---|
| **[Recipes: Standard and RGM] RGM last selected recipe - recipe status text (local)** | *STRING* | Contains the status of the last selected recipe as text.<br>Example: **1 – newly created** |
| **[Recipes: Standard and RGM] RGM last selected recipe - recipe version (local)** | *DINT* | Contains the recipe version of the last selected recipe. |
| **[Recipes: Standard and RGM] RGM last selected recipe - time, last change (local)** | *STRING* | Contains the time at which the last selected recipe was last changed. |

### CHECK RECIPE VALUES

| Variable | Data type | Description |
|---|---|---|
| **[Recipes: Standard and RGM] RGM check recipe values - deviations (global/local)** | *STRING* | List all variable differences in the following order:<br>[**Variable name; recipe value; variable value; unit**]<br>each entry is written in a new line.<br>Requirement: Variable **RGM recipe value check - result** has a value = 1.<br>**Attention**: Variable can either be created and evaluated globally or locally. |
| **[Recipes: Standard and RGM] RGM check recipe values - authorization (global/local)** | *DINT* | Authorization level of the last recipe checked. |
| **[Recipes: Standard and RGM] RGM check recipe values - operator, last change (global/local)** | *STRING* | Name of the user who was logged in when the last change was made to the last recipe checked. |
| **[Recipes: Standard and RGM] RGM check recipe values - result (global/local)** | *DINT* | Result of the check:<br>▸ *0*: All value match.<br>▸ *1*: At least one variable value deviates from the recipe value.<br>▸ *2*: At least one variable is faulty |

| Variable | Data type | Description |
|---|---|---|
| | | (INVALID).<br>▸ *3*: Checking is not possible, because the column for the current value is not displayed. System driver variable is reset.<br>Error messages:<br>▸ *-1*: En error while reading the variable value occurred.<br>▸ *-2*: The recipe group could not be opened.<br>▸ *-3*: The recipe could not be changed.<br>**Attention**: Variable can either be created and evaluated globally or locally. |
| **[Recipes: Standard and RGM] Check RGM recipe values - comment 1 to 8 (global/local)** | *STRING* | Eight comments can be added to a recipe. The variable contains the comment of the respective number for the last recipe checked. |
| **[Recipes: Standard and RGM] RGM check recipe values - recipe group name (global/local)** | *STRING* | Name of the recipe group of the recipe checked last.<br>Requirement: Variable **RGM recipe value check - result** has a value >= -1.<br>**Attention**: Variable can either be created and evaluated globally or locally. |
| **[Recipes: Standard and RGM] RGM check recipe values - recipe name (global/local)** | *STRING* | Name of the recipe checked last.<br>Requirement: Variable **RGM recipe value check - result** has a value >= -1.<br>**Attention**: Variable can either be created and evaluated globally or locally. |
| **[Recipes: Standard and RGM] RGM check recipe values - recipe number (global/local)** | *UDINT* | Number of the recipe checked last.<br>Requirement: Variable **RGM recipe value check - result** has a value >= -1.<br>**Attention**: Variable can either be created |

| Variable | Data type | Description |
|---|---|---|
| | | and evaluated globally or locally. |
| **[Recipes: Standard and RGM] RGM check recipe values - recipe status (global/local)** | *DINT* | Status of the last recipe checked as a number. |
| **[Recipes: Standard and RGM] RGM check recipe values - recipe text (global/local)** | *STRING* | Status of the last recipe checked as text in the format: **1 - @Text** |
| **[Recipes: Standard and RGM] RGM check recipe values - recipe version (global/local)** | *DINT* | Version of the last recipe checked. |
| **[Recipes: Standard and RGM] RGM check recipe values - time, last change (global/local)** | *STRING* | Time of the last recipe change of the last recipe checked. |

### RGM BEHAVIOR

All variables are saved locally on the client and assigned data at the time a recipe is selected. If values are changed after values have been selected, for example the recipe number or a comment, then this data is not displayed for the variables. This means: The variables represent a snapshot at the time the recipe is selected. It is therefore possible to establish what was changed after saving.

## 6.19 Theme - [Command Sequencer]

The following system driver variables are available for this subject area:

**Note:** This group is only visible with a valid license for the **Command sequences** module.

| Name | Data type | Comment |
|---|---|---|
| **[Command Sequencer] Number of pending user interactions** | *DINT* | Number of command sequences with pending user interaction that are currently running.<br>If the operation has been executed or the command sequence has been completed, the numeric value is reduced by 1.<br>If several steps are waiting for an operation in a command sequence, the numeric variable is incremented for each step. |
| **[Command Sequencer]** | *DINT* | Number of command sequences currently running. |

| Name | Data type | Comment |
|---|---|---|
| **Number of running command sequences** | | The system variable is updated both at the start and end of a command sequence. |
| **[Command Sequencer] Export result numeric** | *DINT* | Result of the XML export:<br>▸ *-1*:<br>is being executed<br>▸ *0*:<br>Initialization value read successfully<br>▸ from 1:<br>Number of errors that occurred |
| **[Command Sequencer] Export result text** | *STRING* | Result of the XML export as a text.<br>▸ *No errors occurred.*<br>▸ *XML export error:The export file [save location]\[file name] already exists and must not be overwritten.*<br>**Note:** Only occurs if the **Overwrite existing file** property is not active in the export dialog and there is already a file with the same name in the export folder. |
| **[Command Sequencer] Export result XML** | *STRING* | Detailed content of the XML export.<br>This variable visualizes the content of the XML export. The following are displayed:<br>▸ *Name*<br>▸ *Version*<br>▸ *Type*<br>▸ *ID*<br>**Note:** If the content exceeds the maximum length of the system driver variable, the result is shortened. |
| **[Command Sequencer] Import result numeric** | *DINT* | Result of the XML import:<br>▸ *-1*:<br>is being executed<br>▸ *0*:<br>Initialization value read successfully |

| Name | Data type | Comment |
|---|---|---|
| | | ▸ from 1:<br>Number of errors that occurred |
| **[Command Sequencer] Import result text** | *STRING* | Result of the XML import as a text:<br>▸ *The command sequence was not found. The command sequence therefore cannot be imported.*<br>▸ *The command sequence could not be overwritten due to an incorrect status.*<br>▸ *The command sequence cannot be imported as a new version. The versioning is not active.*<br>▸ *The command sequence could not be imported. It does not match the selected type.*<br>▸ *The command sequence could not be imported because the name is not permissible.* |
| **[Command Sequencer] Import result XML** | *STRING* | Detailed content of the XML import.<br>This variable visualizes the content of the XML export. The following are displayed:<br>▸ *Name*<br>▸ *Version*<br>▸ *Type*<br>▸ *ID*<br>**Note:** If the content exceeds the maximum length of the system driver variable, the result is shortened. |
| **[Command Sequencer] Name of the active taught command sequence** | *STRING* | Name of the command sequence that is currently being taught. The command sequence names are used once the teaching process has been started.<br>If a teaching process has been completed, the value of this variable switches to empty. |
| **[Command Sequencer] Names of the running command sequences** | *STRING* | Names of the command sequences currently running: With several command sequences, the command sequence names are separated by a semicolon (;). |
| **[Command Sequencer] Names of command** | *STRING* | Names of command sequences running with user |

| Name | Data type | Comment |
|---|---|---|
| **sequences with pending user interaction** | | interactions pending.<br>If several steps are waiting for an operation in a command sequence, the command sequence name is only entered once and is retained until all steps have been executed.<br>With several command sequences, the command sequence names are separated by a semicolon (;). |
| **[Command Sequencer] Teaching status** | *DINT* | Status for the teaching process. Shows whether teaching is currently active or not active.<br>▸ 0 - Teaching is not active.<br>▸ 1 - Teaching cursor waits for positioning (this status is active until the teaching cursor in the command sequences editor has been placed)<br>▸ 2 - Teaching is active.<br>This variable has the value 2 in the event of an ongoing teaching process.<br>If a teaching process has been completed, the value of this variable switches to 0. |

### Information

If a computer in redundancy operation upgrades to become the server, it sets the value of the system driver variables to *0* (numerical variables) or *empty string* (string variables).

## 6.20 Theme - [System information]

The following system driver variables are available for this subject area:

| Name | Data type | Comment |
|---|---|---|
| **[System information] Operating system user** | *STRING* | Name of the user who has started Runtime on the current computer. |

| Name | Data type | Comment |
|---|---|---|
| **[System information] Dongle status** | *BOOL* | **Note:** Only up to version 7.60.<br>As of Version 8.00 **[System information] License protection present** is used.<br><br>Current status of the dongle:<br>▸ *True* or *1*<br>Dongle is plugged in and provides a valid license.<br>▸ *False* or *0*<br>Loss of the license - no dongle with valid license found.<br><br>**Note:** Only available for dongle licensing. Depending on the latency, a status change can take several minutes. |
| **[System information] Hard disk data storage active/inactive** | *BOOL* | Displays whether the hard-disk data storage of the variables in zenon is activated.<br>0 = HDD administration is inactive<br>1 = HDD administration is active |
| **[System information] License protection present**<br><br>**(local/global)** | *BOOL* | Shows whether the product is licensed:<br>▸ *0*: No valid license.<br>▸ *1*: Valid license.<br><br>The variable initially has the status *1*. The variable is set to *0* in the event of a loss of the license. As soon as there is a license available, the variable is set to *1* again.<br><br>**Note in relation to global variables:** Other network participants can set the value of the variable to *1* (license present) although the license continues to be lacking from the triggering computer. With global variables, the falling flank must therefore be evaluated.<br><br>**Note:** Used as of Version 8.00 on. The **[System information] Dongle status** variable used up to Version 7.60 can no longer be configured starting with Version 8.00. If Runtime files are created in a Version 8.00 or higher for use in 7.60 or lower, the **[System information] License protection present (local)** variable is automatically replaced by **[System information] Dongle status**. |
| **[System information]** | *UDINT* | Local memory variables that are not updated in the |

| Name | Data type | Comment |
|---|---|---|
| **Local system variable: DWORD 1-4** | | network.<br>The values for these variables can be predefined in the *zenon6.ini*. They can thus be used as local constants on any computer. |
| **[System information] Computer name** | *STRING* | Shows the name of the local computer. |
| **[System information] Runtime folder not available** | *BOOL* | Checks whether the data directory of the Runtime is available.<br>Upon a negative result, the Runtime will no longer try to perform read or write access on the directory.<br>The ring buffers of the AML/CEL/HDD management will not be closed. Runtime no longer checks the availability of the folder from this time. As soon as the directory is available again, the Runtime will have to be restarted again. |
| [**[System information] Runtime version** | *STRING* | Current version of Runtime of the calling computer:<br>*Version [Version number] SP[Service pack number] Build [Build number] [System platform]*<br>Example:<br>*Version 820 SP0 Build 32408 64Bit* |
| **[System information] Runtime status (simulation)** | *DINT* | Displays the current status of the Runtime. The following values are available for the variable:<br>▸ *0*: Process connection. The Runtime is currently in hardware mode.<br>▸ *1*: Switch to process connection in simulation.<br>▸ *2*: Change to simulation with process connection.<br>▸ *3*: In simulation:<br>▸ *4*: In simulation: Changes the simulation image.<br>▸ 5: In playback mode of the **Process Recorder** module. |
| **[System information] Idle time[s]** | *UDINT* | Displays for how long no operation has been carried out in the Runtime. The time is displayed in seconds. The variable is updated cyclically. You can define the cycle time in the file *project.ini*.<br>**Example:** For example, to update the variable every 5 seconds, add *UPDATE_SEK=5* to the **[Systemtreiber]** area |

| Name | Data type | Comment |
|---|---|---|
| | | in zenon6.ini. |
| **[System information] Time offset to UCT** | *DINT* | Calling computer's current time offset to UTC in seconds.<br>This value is prefixed according to the time zone. There is no distinction of whether daylight saving time or standard time is active. |
| **[System information] Daylight saving/standard time** | *BOOL* | Current type of time (daylight saving time or standard time) of the calling computer:<br>▸ *True* or *1*<br>Daylight saving time active. Note the additional offset to standard deviation from UTC.<br>▸ *False* or *0*<br>Standard time active. No offset to standard deviation from UTC. |
| **[System information] Remaining time until license expires** | *DWORD* | This shows in the Runtime how long the current license is still valid.<br>The display is in hours for:<br>▸ Demo license<br>▸ License with expiration date<br>▸ Borrowed license with expiration date<br>▸ No valid license found:<br>If no valid alternative license is found, the variable **[System information] License protection present** will be set to *0* and the remaining time will be displayed with this variable *0*.<br>In all other cases, the value *4294967295* will be displayed.<br>**Note:** The information displayed always relates to the currently valid license. If you change to a different license, for example, due to a network failure, the remaining period of validity will also change. |

## 6.21 Creating variables by importing

Variables can also be imported by importing them. The XML and DBF import is available for every driver.

> **Information**
>
> You can find details on the import and export of variables in the Import-Export manual in the Variables section.

### 6.21.1 XML import

During XML import of variables or data types, these are first assigned to a driver and then analyzed. Before import, the user decides whether and how the respective element (variable or data type) is to be imported:

- *Import*:
  The element is imported as a new element.
- *Overwrite*:
  The element is imported and overwrites a pre-existing element.
- *Do not import*:
  The element is not imported.

**Note:** The actions and their durations are shown in a progress bar during import. The import of variables is described in the following documentation. Data types are imported along the same lines.

#### REQUIREMENTS

The following conditions are applicable during import:

- **Backward compatibility**

  At the XML import/export there is no backward compatibility. Data from older zenon versions can be taken over. The handover of data from newer to older versions is not supported.

- **Consistency**

  The XML file to be imported has to be consistent. There is no plausibility check on importing the file. If there are errors in the import file, this can lead to undesirable effects in the project.

  Particular attention must be paid to this, primarily if not all properties exist in the XML file and these are then filled with default values. E.g.: A binary variable has a limit value of *300*.

- **Structure data types**

Structure data types must have the same number of structure elements.
Example: A structure data type in the project has 3 structure elements. A data type with the same name in the XML file has 4 structure elements. Then none of the variables based on this data type in the file are imported into the project.

### Hint

You can find further information on XML import in the **Import - Export** manual, in the **XML import** chapter.

## 6.21.2 DBF Import/Export

Data can be exported to and imported from dBase.

### Information

Import and Export via CSV or dBase supported; no driver specific variable settings, such as formulas. Use export/import via XML for this.

### IMPORT DBF FILE

To start the import:

1. right-click on the variable list.
2. In the drop-down list of **Extended export/import...** select the **Import dBase** command.
3. Follow the instructions of the import assistant.

The format of the file is described in the chapter File structure.

### Information

Note:

- Driver object type and data type must be amended to the target driver in the DBF file in order for variables to be imported.
- dBase does not support structures or arrays (complex variables) at import.

### EXPORT DBF FILE

To start the export:

1. right-click on the variable list.

2. In the drop-down list of **Extended export/import...** select the **Export dBase...** command .
3. Follow the instructions of the import assistant.

> **Attention**
>
> DBF files:
>
> - must correspond to the 8.3 DOS format for filenames (8 alphanumeric characters for name, 3 character suffix, no spaces)
> - must not have dots (.) in the path name.
> e.g. the path *C:\users\John.Smith\test.dbf* is invalid.
> Valid: *C:\users\JohnSmith\test.dbf*
> - must be stored close to the root directory in order to fulfill the limit for file name length including path: maximum 255 characters

The format of the file is described in the chapter File structure.

> **Information**
>
> dBase does not support structures or arrays (complex variables) at export.

## FILE STRUCTURE OF THE DBASE EXPORT FILE

The dBaseIV file must have the following structure and contents for variable import and export:

> **Attention**
>
> dBase does not support structures or arrays (complex variables) at export.
>
> DBF files must:
>
> - conform with their name to the 8.3 DOS format (8 alphanumeric characters for name, 3 characters for extension, no space)
> - Be stored close to the root directory (Root)

## STRUCTURE

| Identification | Type | Field size | Comment |
|---|---|---|---|
| **KANALNAME** | Char | 128 | Variable name.<br>The length can be limited using the **MAX_LAENGE** entry in the **project.ini** file. |
| **KANAL_R** | C | 128 | The original name of a variable that is to be replaced by |

| Identification | Type | Field size | Comment |
|---|---|---|---|
| | | | the new name entered under "VARIABLENNAME" (variable name) (field/column must be entered manually).<br>The length can be limited using the **MAX_LAENGE** entry in the **project.ini** file. |
| **KANAL_D** | Log | 1 | The variable is deleted with the *1* entry (field/column has to be created by hand). |
| **TAGNR** | C | 128 | Identification.<br>The length can be limited using the **MAX_LAENGE** entry in the **project.ini** file. |
| **EINHEIT** | C | 11 | Technical unit |
| **DATENART** | C | 3 | Data type (e.g. bit, byte, word, ...) corresponds to the data type. |
| **KANALTYP** | C | 3 | Memory area in the PLC (e.g. marker area, data area, ...) corresponds to the driver object type. |
| **HWKANAL** | Num | 3 | Net address |
| **BAUSTEIN** | N | 3 | Datablock address (only for variables from the data area of the PLC) |
| **ADRESSE** | N | 5 | Offset |
| **BITADR** | N | 2 | For bit variables: bit address<br>For byte variables: 0=lower, 8=higher byte<br>For string variables: Length of string (max. 63 characters) |
| **ARRAYSIZE** | N | 16 | Number of variables in the array for index variables<br>ATTENTION: Only the first variable is fully available. All others are only available for VBA or the Recipegroup Manager |
| **LES_SCHR** | L | 1 | Write-Read-Authorization<br>0: Not allowed to set value.<br>1: Allowed to set value. |
| **MIT_ZEIT** | R | 1 | time stamp in zenon (only if supported by the driver) |
| **OBJEKT** | N | 2 | Driver-specific ID number of the primitive object |

| Identification | Type | Field size | Comment |
|---|---|---|---|
| | | | comprises TREIBER-OBJEKTTYP and DATENTYP |
| **SIGMIN** | Float | 16 | Non-linearized signal - minimum (signal resolution) |
| **SIGMAX** | F | 16 | Non-linearized signal - maximum (signal resolution) |
| **ANZMIN** | F | 16 | Technical value - minimum (measuring range) |
| **ANZMAX** | F | 16 | Technical value - maximum (measuring range) |
| **ANZKOMMA** | N | 1 | Number of decimal places for the display of the values (measuring range) |
| **UPDATERATE** | F | 19 | Update rate for mathematics variables (in sec, one decimal possible)<br>not used for all other variables |
| **MEMTIEFE** | N | 7 | Only for compatibility reasons |
| **HDRATE** | F | 19 | HD update rate for historical values (in sec, one decimal possible) |
| **HDTIEFE** | N | 7 | HD entry depth for historical values (number) |
| **NACHSORT** | R | 1 | HD data as postsorted values |
| **DRRATE** | F | 19 | Updating to the output (for zenon DDE server, in [s], one decimal possible) |
| **HYST_PLUS** | F | 16 | Positive hysteresis, from measuring range |
| **HYST_MINUS** | F | 16 | Negative hysteresis, from measuring range |
| **PRIOR** | N | 16 | Priority of the variable |
| **REAMATRIZE** | C | 32 | Allocated reaction matrix |
| **ERSATZWERT** | F | 16 | Substitute value, from measuring range |
| **SOLLMIN** | F | 16 | Minimum for set value actions, from measuring range |
| **SOLLMAX** | F | 16 | Maximum for set value actions, from measuring range |
| **VOMSTANDBY** | R | 1 | Get value from standby server; the value of the variable is not requested from the server but from the Standby Server in redundant networks |
| **RESOURCE** | C | 128 | Resources label. |

| Identification | Type | Field size | Comment |
|---|---|---|---|
| | | | Free string for export and display in lists.<br>The length can be limited using the MAX_LAENGE entry in **project.ini**. |
| **ADJWVBA** | R | 1 | Non-linear value adaption:<br>*0*: Non-linear value adaption is used<br>*1*: Non-linear value adaption is not used |
| **ADJZENON** | C | 128 | Linked VBA macro for reading the variable value for non-linear value adjustment. |
| **ADJWVBA** | C | 128 | ed VBA macro for writing the variable value for non-linear value adjustment. |
| **ZWREMA** | N | 16 | Linked counter REMA. |
| **MAXGRAD** | N | 16 | Gradient overflow for counter REMA. |

### Attention

When importing, the driver object type and data type must be amended to the target driver in the DBF file in order for variables to be imported.

## LIMIT VALUE DEFINITION

Limit definition for limit values *1* to *4*, or status *1* to *4*:

| Identification | Type | Field size | Comment |
|---|---|---|---|
| **AKTIV1** | R | 1 | Limit value active (per limit value available) |
| **GRENZWERT1** | F | 20 | technical value or ID number of a linked variable for a dynamic limit value (see VARIABLEx)<br>(if VARIABLEx is *1* and here it is *-1*, the existing variable linkage is not overwritten) |
| **SCHWWERT1** | F | 16 | Threshold value for limit value |
| **HYSTERESE1** | F | 14 | Is not used |
| **BLINKEN1** | R | 1 | Set blink attribute |
| **BTB1** | R | 1 | Logging in CEL |

| Identification | Type | Field size | Comment |
|---|---|---|---|
| **ALARM1** | R | 1 | Alarm |
| **DRUCKEN1** | R | 1 | Printer output (for CEL or Alarm) |
| **QUITTIER1** | R | 1 | Must be acknowledged |
| **LOESCHE1** | R | 1 | Must be deleted |
| **VARIABLE1** | R | 1 | Dyn. limit value linking<br>the limit is defined by an absolute value (see field GRENZWERTx). |
| **FUNC1** | R | 1 | Functions linking |
| **ASK_FUNC1** | R | 1 | Execution via Alarm Message List |
| **FUNC_NR1** | N | 10 | ID number of the linked function<br>(if "-1" is entered here, the existing function is not overwritten during import) |
| **A_GRUPPE1** | N | 10 | Alarm/Event Group |
| **A_KLASSE1** | N | 10 | Alarm/Event Class |
| **MIN_MAX1** | C | 3 | Minimum, Maximum |
| **FARBE1** | N | 10 | Color as Windows coding |
| **GRENZTXT1** | C | 66 | Limit value text |
| **A_DELAY1** | N | 10 | Time delay |
| **INVISIBLE1** | R | 1 | Invisible |

Expressions in the column "Comment" refer to the expressions used in the dialog boxes for the definition of variables. For more information, see chapter Variable definition.

# 7 Driver-specific functions

The driver supports the following functions:

## ZENON6.INI ENTRIES

| Entry | Function |
|---|---|
| **[SYSTEMTREIBER]** | Entries for system driver. |

| Entry | Function |
|---|---|
| **UPDATE_SEK =** | Cycle time of the system driver in seconds |
| **[LOCAL_VAR]** | **Entries for the system driver variables.** |
| **ID_DWORD_1 = <Wert>**<br>**ID_DWORD_2 = <Wert>**<br>**ID_DWORD_3 = <Wert>**<br>**ID_DWORD_4 = <Wert>** | These entries deliver the values for the system driver variables **System info -> Local system variable: DWORD1-4**.<br>These variables are intended for the identification of a single computer in the network. This means the values are always managed locally in the **zenon.ini** file.<br>By default, limit values can be defined for each of these variables.<br>If there are no entries in the **zenon.ini** file, the values of these variables will be set to *0* in zenon in the Runtime. |

# 8 Driver command function

The zenon **Driver commands** function is to influence drivers using zenon.
You can do the following with a driver command:

- Start
- Stop
- Shift a certain driver mode
- Instigate certain actions

**Note:** This chapter describes standard functions that are valid for most zenon drivers.
Not all functions described here are available for every driver. For example, a driver that does not, according to the data sheet, support a modem connection also does not have any modem functions.

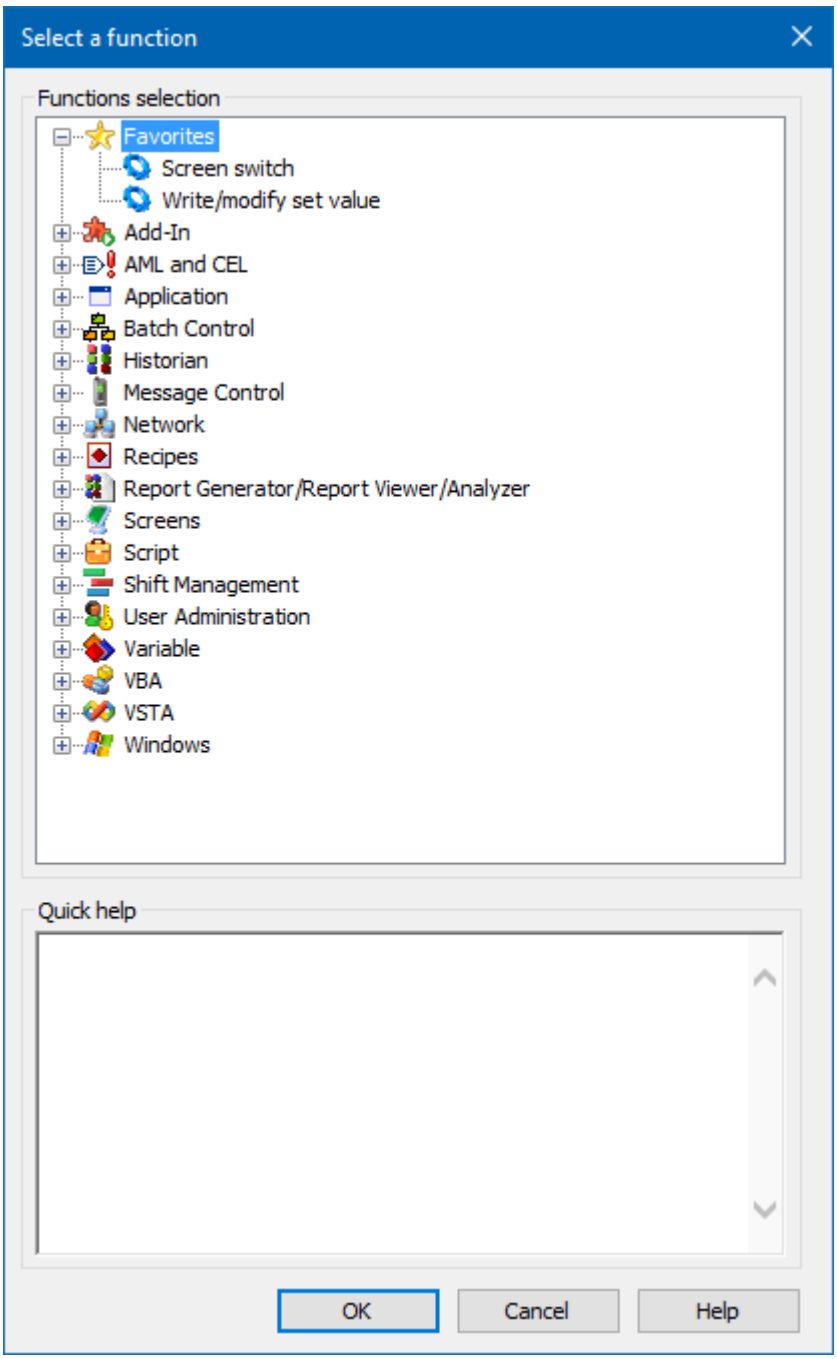
> **⚠Attention**
>
> The zenon **Driver commands** function is not identical to driver commands that can be executed in the Runtime with Energy drivers!

## CONFIGURATION OF THE FUNCTION

Configuration is carried out using the **Driver commands** function.
To configure the function:

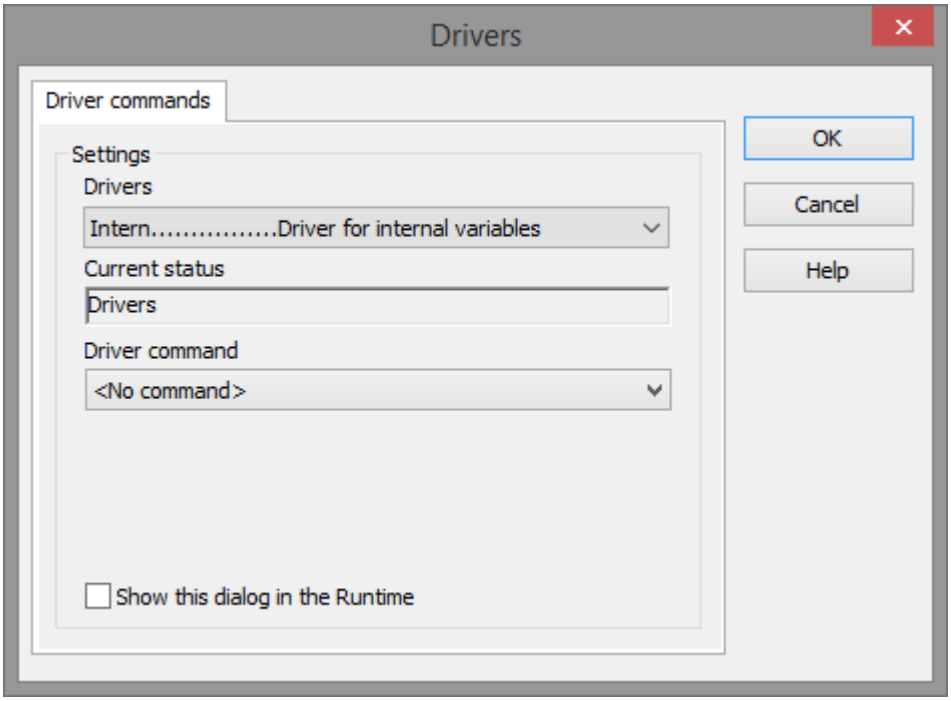
1. Create a new function in the zenon Editor.

The dialog for selecting a function is opened



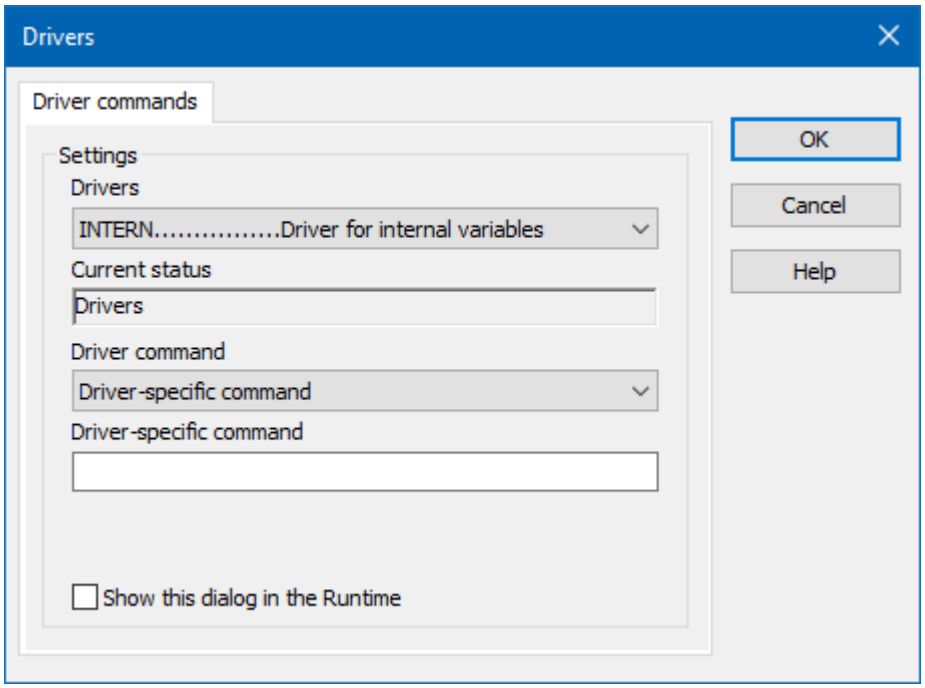

2. Navigate to the node **Variable.**
3. Select the **Driver commands** entry.

The dialog for configuration is opened




4. Select the desired driver and the required command.
5. Close the dialog by clicking on **OK** and ensure that the function is executed in the Runtime. Heed the notices in the **Driver command function in the network** section.

## DRIVER COMMAND DIALOG



| Option | Description |
|---|---|
| **Driver** | Selection of the driver from the drop-down list.<br>It contains all drivers loaded in the project. |
| **Current condition** | Fixed entry that is set by the system.<br>no function in the current version. |
| **Driver command** | no function in the current version.<br><br>For details on the configurable driver commands, see the **available driver commands** section. |
| **Driver-specific command** | Entry of a command specific to the selected driver.<br><br>**Note:** Only available if, for the **driver command** option, the *driver-specific command* has been selected. |
| **Show this dialog in the Runtime** | Configuration of whether the configuration can be changed in the Runtime:<br>▸ *Active*: This dialog is opened in the Runtime before executing the function. The configuration can thus still be changed in the Runtime before execution.<br>▸ *Inactive*: The Editor configuration is applied in the Runtime when executing the function.<br><br>Default: *inactive* |

### CLOSE DIALOG

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

### AVAILABLE DRIVER COMMANDS

These driver commands are available - depending on the selected driver:

| Driver command | Description |
|---|---|
| *No command* | No command is sent.<br>A command that already exists can thus be removed from a configured function. |

| Driver command | Description |
|---|---|
| *Start driver (online mode)* | Driver is reinitialized and started.<br>**Note:** If the driver has already been started, it must be stopped. Only then can the driver be re-initialized and started. |
| *Stop driver (offline mode)* | Driver is stopped. No new data is accepted.<br>**Note:** If the driver is in offline mode, all variables that were created for this driver receive the status *switched off* (*OFF*; Bit *20*). |
| *Driver in simulation mode* | Driver is set into simulation mode.<br>The values of all variables of the driver are simulated by the driver. No values from the connected hardware (e.g. PLC, bus system, ...) are displayed. |
| *Driver in hardware mode* | Driver is set into hardware mode.<br>For the variables of the driver the values from the connected hardware (e.g. PLC, bus system, ...) are displayed. |
| *Driver-specific command* | Entry of a driver-specific command. Opens input field in order to enter a command. |
| *Driver - activate set setpoint value* | Write set value to a driver is possible. |
| *Driver - deactivate set setpoint value* | Write set value to a driver is prohibited. |
| *Establish connecton with modem* | Establish connection (for modem drivers)<br>Opens the input fields for the hardware address and for the telephone number. |
| *Disconnect from modem* | Terminate connection (for modem drivers) |
| *Driver in counting simulation mode* | Driver is set into counting simulation mode.<br>All values are initialized with *0* and incremented in the set update time by *1* each time up to the maximum value and then start at *0* again. |
| *Driver in static simulation mode* | No communication to the controller is established. All values are initialized with *0*. |
| *Driver in programmed simulation mode* | The values are calculated by a freely-programmable simulation project. The simulation project is created with the help of the zenon Logic Workbench and runs in the zenon Logic Runtime. |

### DRIVER COMMAND FUNCTION IN THE NETWORK

If the computer on which the **Driver commands** function is executed is part of the zenon network, further actions are also carried out:

- A special network command is sent from the computer to the project server.
  It then executes the desired action on its driver.
- In addition, the Server sends the same driver command to the project standby.
  The standby also carries out the action on its driver.

This makes sure that Server and Standby are synchronized. This only works if the Server and the Standby both have a working and independent connection to the hardware.

# 9 Error analysis

Should there be communication problems, this chapter will assist you in finding out the error.

## 9.1 Analysis tool

All zenon modules such as Editor, Runtime, drivers, etc. write messages to a joint log file. To display them correctly and clearly, use the Diagnosis Viewer program that was also installed with zenon. You can find it under **Start/All programs/zenon/Tools 8.20 -> Diagviewer.**

zenon driver log all errors in the LOG files.LOG files are text files with a special structure. The default folder for the LOG files is subfolder **LOG** in the folder **ProgramData**. For example:

**%ProgramData%\COPA-DATA\LOG**.

**Attention:** With the default settings, a driver only logs error information. With the Diagnosis Viewer you can enhance the diagnosis level for most of the drivers to "Debug" and "Deep Debug". With this the driver also logs all other important tasks and events.

In the Diagnosis Viewer you can also:

- Follow newly-created entries in real time
- customize the logging settings
- change the folder in which the LOG files are saved

**Note:**

1. The Diagnosis Viewer displays all entries in UTC (coordinated world time) and not in local time.

2. The Diagnosis Viewer does not display all columns of a LOG file per default. To display more columns activate property **Add all columns with entry** in the context menu of the column header.
3. If you only use **Error-Logging**, the problem description is in the column **Error text**. For other diagnosis level the description is in the column **General text**.
4. For communication problems many drivers also log error numbers which the PLC assigns to them. They are displayed in **Error text** or **Error code** or **Driver error parameter** (**1** and **2)**. Hints on the meaning of error codes can be found in the driver documentation and the protocol/PLC description.
5. At the end of your test set back the diagnosis level from **Debug** or **Deep Debug**. At **Debug** and **Deep Debug** there are a great deal of data for logging which are saved to the hard drive and which can influence your system performance. They are still logged even after you close the Diagnosis Viewer.

> **Attention**
>
> In Windows CE errors are not logged per default due to performance reasons.

You can find further information on the Diagnosis Viewer in the Diagnose Viewer manual.

## 9.2 Driver monitoring

Runtime monitors the availability of the driver by means of a watchdog. If a driver is no longer available, the *INVALID* status bit is also set for all checked-in variables.

Possible causes for a triggering of the watchdog:

- The driver process is no longer running.

  Check whether the driver EXE file is still running in the Task Manager.
- Operating system is busy with processes that have a higher priority.

  Check the configuration of your system to see whether there is sufficient memory and CPU power. In this case, the driver only resets the *INVALID* status bit if there is a value change on the connected party. Static values retain the *INVALID* status bit until the next time the Runtime or the driver is started.

### CONFIGURATION OF WATCHDOG

For the monitoring of communication in the Runtime, the connection to the driver is checked in a fixed, prescribed time period of 60 seconds. This process is repeated several times. If, within 5 attempts (= within 5 minutes), no valid connection to the driver is detected, the *INVALID* bit is set for the checked-in (*advised*) variables. In addition, the *INVALID* bit is also set when new variables are advised. The *INVALID* bit will no longer be reset.

Corresponding LOG entries are created for this.

### LOG ENTRY

An error message is logged in the LOG when the watchdog is triggered:

| Parameter | Description |
|---|---|
| *Communication with driver:<drvExe>/<drvDesc>(id:<drvId>) timed out. No communication for <time> ms.* | No communication with driver within the given time.<br>▸ *<time>*: Time (in milliseconds)<br>▸ *<drvDesc>*: Driver name<br>▸ *<drvExe>*: Driver EXE name<br>▸ *<drvId>*: Driver ID in the zenon project |
| *Communication with %s timed out. Invalid-Bit will be set.* | Communication to the *%s* driver could not be established after 5 attempts within 60 seconds. The *INVALID* bit is set for the variable. |
| *Communication with %s timed out. Timeout happened %d times* | Communication to the *%s* driver could not be established after *%d* times within 60 seconds. |