



COPADATA
do it your way

zenon driver manual

SYSDRV

v.7.50





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1. Welcome to COPA-DATA help

GENERAL HELP

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

PROJECT SUPPORT

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

LICENSES AND MODULES

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

2. 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 68) 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	--
Addressing: Name-based	X
Spontaneous communication	--
Polling communication	X
Online browsing	--
Offline browsing	--
Real-time capable	--
Blockwrite	--
Modem capable	--
Serial logging	--
RDA numerical	--
RDA String	--

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

Platforms:	
Operating systems	Windows CE 6.0, Embedded Compact 7; Windows 7, 8, 8.1, 10, Server 2008R2, Server 2012, Server 2012R2;
CE platforms	x86; ARM;

4. Driver history

Date	Driver version	Change
07.07.08	600	Created driver documentation

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

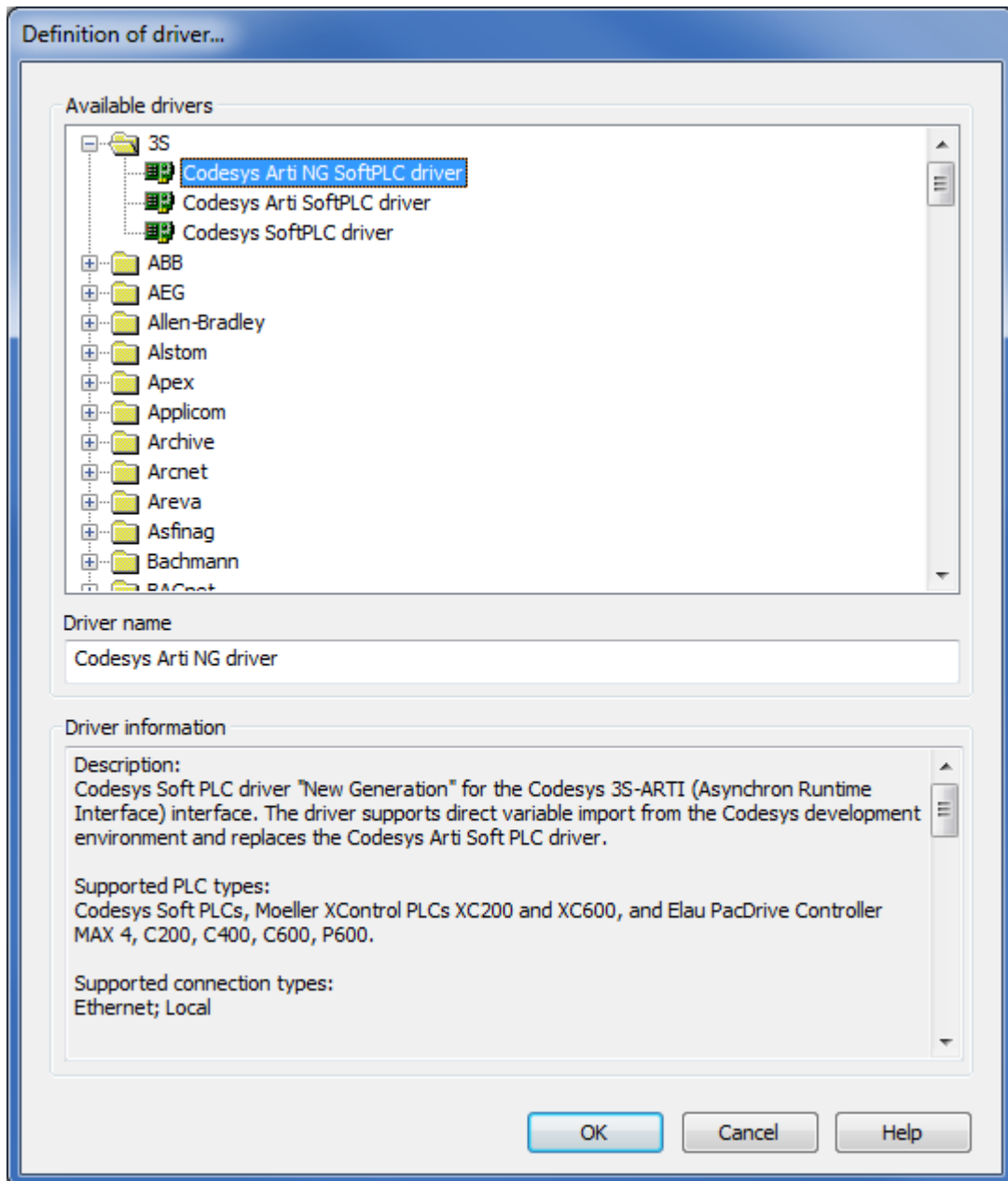
Find out more about further settings for zenon variables in the chapter Variables (main.chm::/15247.htm) of the online manual.

5.1 Creating a driver

In order to create a new driver:

1. Right-click on **Driver** in the Project Manage and select **Driver new** in the context menu.

2. In the following dialog the control system offers a list of all available drivers.



3. Select the desired driver and give it a name:
 - The driver name has to be unique, i.e. if one and the same driver is to be used several times in one project, a new name has to be given each time.
 - 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 with **OK**. In the following dialog the single configurations of the drivers are defined.

Only the respective required drivers need to be loaded for a project. Later loading of an additional driver is possible without problems.



Information

For new projects and for existing projects which are converted to version 6.21 or higher, the following drivers are created automatically:

- ▶ Internal
- ▶ MathDr32
- ▶ SysDrv.

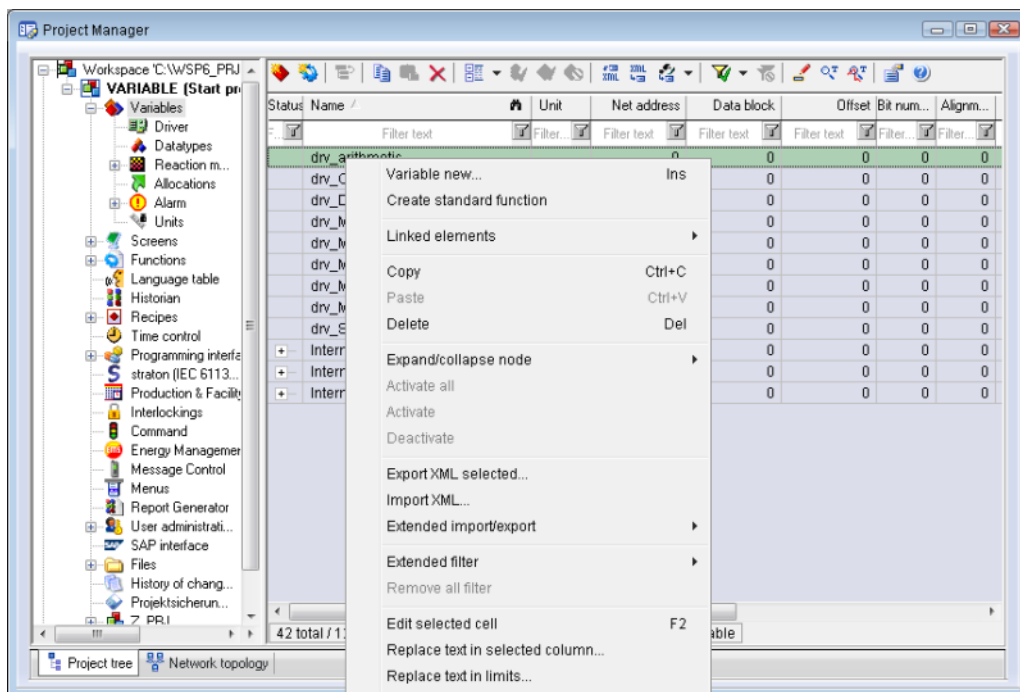
▶

6. Creating variables

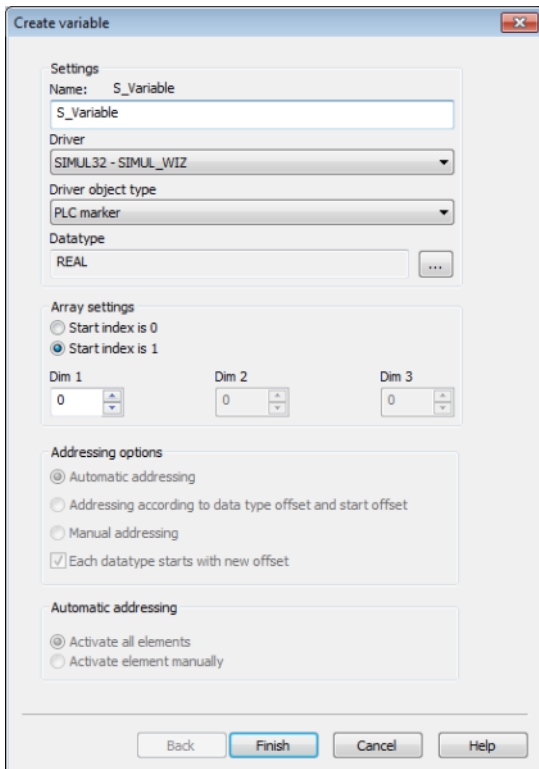
This is how you can create variables in the zenon Editor:

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 as **Driver** SYSDRV – Driver for system variables and as **Driver object type** System driver variable.



The 'Create variable' dialog box is shown. It has a 'Settings' section with the following fields:

- Name: S_Variable
- Driver: SIMUL32 - SIMUL_WIZ
- Driver object type: PLC marker
- Datatype: REAL

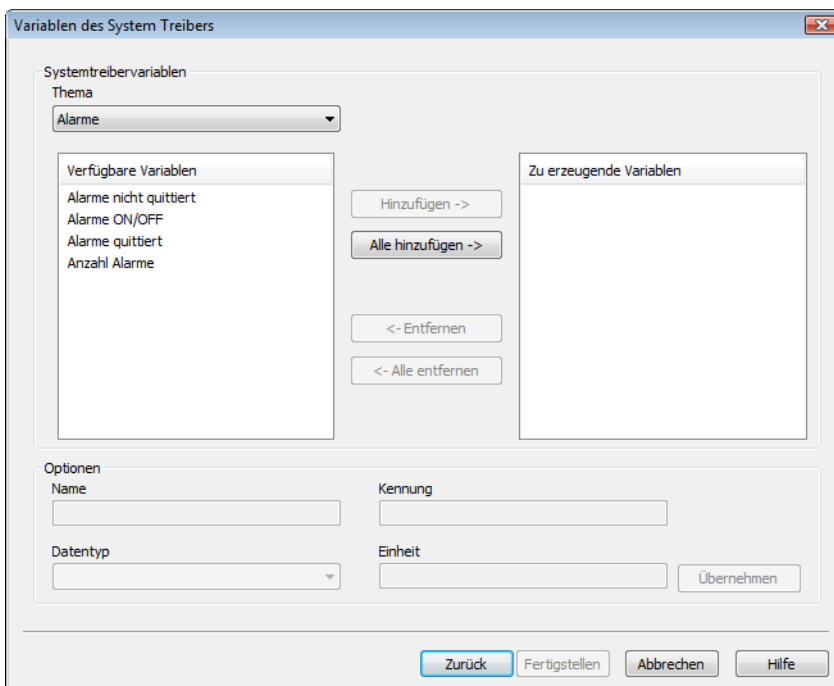
Below the settings is the 'Array settings' section with two radio buttons: 'Start index is 0' and 'Start index is 1' (selected). There are three dimension input fields: Dim 1 (0), Dim 2 (0), and Dim 3 (0).

The 'Addressing options' section has three radio buttons: 'Automatic addressing' (selected), 'Addressing according to data type offset and start offset', and 'Manual addressing'. There is a checked checkbox for 'Each datatype starts with new offset'.

The 'Automatic addressing' section has two radio buttons: 'Activate all elements' (selected) and 'Activate element manually'.

At the bottom are buttons: Back, Finish, Cancel, and Help.

Click on **Next**.



The 'Variablen des System Treibers' dialog box is shown. It has a 'Systemtreibervariablen' section with a 'Thema' dropdown menu set to 'Alarmer'.

Below this are two list boxes: 'Verfügbare Variablen' and 'Zu erzeugende Variablen'. The 'Verfügbare Variablen' list contains: 'Alarmer nicht quittiert', 'Alarmer ON/OFF', 'Alarmer quittiert', and 'Anzahl Alarmer'. There are buttons: 'Hinzufügen ->', 'Alle hinzufügen ->', '<- Entfernen', and '<- Alle entfernen'.

Below the list boxes is the 'Optionen' section with the following fields:

- Name: (empty text box)
- Kennung: (empty text box)
- Datentyp: (empty dropdown menu)
- Einheit: (empty text box)

There is an 'Übernehmen' button next to the 'Einheit' field.

At the bottom are buttons: Zurück, Fertigstellen, Abbrechen, and Hilfe.

The following settings are available.

Parameters	Description
Theme	Select the subject area from which you want to create system driver variables. As long as you edit an existing variable, the selection is disabled.
Available 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.
Add	Adds the currently selected variables to the list of the variables to be created.
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 Options .
Tools	
Name	Edit the name of the selected variable. Note: Only possible if you have selected only one variable. This variable must be a user-defined variable.
Identification	Edit the identification of the selected variable. Note: Only possible if you have selected only one variable.
Data type	Edit the data type of the selected variable. Note: Only possible if you have selected only one variable. This variable must be a user-defined variable.
Measuring unit	Edit the measuring unit of the selected variable. Note: Only possible if you have selected only one variable.
Apply	Left-click this button in order to apply the changed settings to the selected variable. Note: If you select another variable before you click on Apply, all changes are canceled. Only valid changes can be applied.

If you have selected and edited all system driver variables which you want to create, you can create them by left-clicking **Finish**.



Info

In the lists **Available variables** and **Variables to be created** several entries can be selected at once. This happens with:

- ▶ **Ctrl+left-click**: You can select a number of entries by pressing and holding the **Ctrl** key.
- ▶ **Shift+left-click**: All entries that are between the two selected entries are selected.
- ▶ If **Ctrl** and **Shift** are held down at the same time, all entries between the two are selected. Entries already selected are retained.
- ▶ **Ctrl+A**: All entries are selected.

CHANGING THE NAME OF A SYSTEM DRIVER VARIABLE

If you want to change the pre-defined names of the system driver variables, you can do this as follows: Export the desired variables to XML, change the name of the variables in the XML file (property **Name**) and import the file.

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 acknowledged alarms in the memory
[Alarms] Alarms acknowledged	UDINT	Shows the number of acknowledged alarms in the memory
[Alarms] Alarm Message List active/inactive	BOOL	Displays the status of the Alarm Message List: <ul style="list-style-type: none"> ▶ 0: inactive ▶ 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 - [Batch Control]

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

Name	Data type	Comment
[Batch Control] Export result numeric	DINT	<p>The numeric variable is filled with the number of errors that occurred.</p> <p>Example:</p> <ul style="list-style-type: none"> ▶ -1: is being executed ▶ 0: Initialization value read successfully ▶ from 1: Number of errors that occurred
[Batch Control] Export result string	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. They are local string variables.
[Batch Control] Import result numeric	DINT	<p>The numeric variable is filled with the number of errors that occurred.</p> <p>Example:</p> <ul style="list-style-type: none"> ▶ -1: is being executed ▶ 0: Initialization value read successfully ▶ from 1: Number of errors that occurred

[Batch Control] Import result string	STRING	<p>The string variable is filled with the result of the import.</p> <p>Batch XML import specific error:</p> <ul style="list-style-type: none"> ▶ The master recipe of the control recipe could not be found. The control recipe cannot be imported. ▶ The master recipe of the control recipe is not released. The control recipe cannot be imported. ▶ The control/master recipe cannot be imported because it is an invalid instance of the master recipe. ▶ The control/master recipe could not be created due to an invalid job variable. ▶ The control/master recipe could not be created due to an invalid value of the job variable. ▶ The control/master recipe could not be overwritten because it does not have the correct status. ▶ The control recipe cannot be imported as a new version. The versioning is not active. ▶ The control/master recipe could not be imported because it does not match the selected type.
[Batch Control] Import result XML	STRING	<p>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. They are local string variables.</p>
[Batch Control] Recipe terminated due to an error	BOOL	<p>Is set to 1 if a recipe cannot be restarted. Before creating an image, the variable is set to 0.</p> <p>This variable is distributed in the network.</p>
[Batch Control] Set value input: Measuring unit	STRING	<p>Unit of the variable.</p>
[Batch Control] Set value input: Parameter Maximum	STRING	<p>Parameter Maximum</p> <p>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</p>

		<p>with the maximum of the variables is filled.</p> <p>If the "Amendable in the control recipe" bit is edited, it receives the value 1.</p>
[Batch Control] Set value input: Parameter Minimum	STRING	<p>Parameter Minimum</p> <p>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 with the minimum of the variables is filled.</p> <p>If the "Amendable in the control recipe" bit is edited, it receives the value 0.</p>
[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.

6.6 Theme - [Command Processing]

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



Information

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

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 current step of the command processing 0 = Initialization 1 = Step 1 2 = Unlock 3 = Step 2 4 = Lock 5 = Execution
[Command Processing] Identification of the action variable	DINT	Identifies the type of the currently active action 0 = Pulse command 1 = Switching command 2 = Setpoint input 3 = Status input 4 = Replace 5 = Manual correction 6 = Block 7 = Release 8 = Lock 9 = Revision 1000 = Not defined
[Command Processing] Name of the action variable	STRING	Name of the data point 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. In case of a pulse command, the command processing status will be displayed; otherwise, the current switching direction will be displayed.
[Command Processing] Update	BOOL	This variable is set to 1 if the listed variables are consistent.
[Command Processing] Interlocking code	UDINT	Status of the current interlocking. 0 = Not checked 1 = No active interlocking 2 = Value already set 3 = Not used 4 = Not used 5 = Write failure 6 = Internal Error 7 = Not used

		8 = Data point type invalid 9 = Not used 10 = Command interlocking does not exist 11 = Action does not exist 12 = Not used 13 = Not used 14 = Value missing 15 = Invalid value 16 = Topology unlockable 17 = Topology not unlockable 18 = Not used 19 = Not used 20 = Interlocking of the action unlockable 21 = Interlocking of the action not unlockable 22 = Not used 23 = Locked against command processing 24 = Locking administration invalid 25 = SBO expired 26 = Timeout for SBO activation 27 = Timeout for SBO Deactivation 28 = Timeout for Action execution 29 = SBO expired
[Command Processing] Interlocking message	STRING	Shows the text of the active interlocking message.

6.7 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 . Attention: These variables have been obsolete since the introduction of the internal driver and should no longer be used.

6.8 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	<p>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.</p> <p>Authorization level 0 corresponds to decimal value $2^0 = 1$ Authorization level 1 corresponds to decimal value $2^1 = 2$ Authorization level 0 and 1 corresponds to decimal value 2^0 and $2^1 = 3$ etc.</p> <p>The 128 possible authorization levels are distributed to 4 double words (authorization groups 1-4) with increasing value.</p> <p>Indicates authorization level 0 - 31.</p>
[User administration] Current authorization group 2	UDINT	<p>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.</p> <p>Authorization level 0 corresponds to decimal value $2^0 = 1$ Authorization level 1 corresponds to decimal value $2^1 = 2$ Authorization level 0 and 1 corresponds to decimal value 2^0 and $2^1 = 3$ etc.</p> <p>The 128 possible authorization levels are distributed to 4 double words (authorization groups 1-4) with increasing value.</p> <p>Indicates authorization level 32 - 63.</p>
[User administration] Current authorization group 3	UDINT	<p>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.</p> <p>Authorization level 0 corresponds to decimal value $2^0 = 1$ Authorization level 1 corresponds to decimal value $2^1 = 2$ Authorization level 0 and 1 corresponds to decimal value 2^0 and $2^1 = 3$ etc.</p> <p>The 128 possible authorization levels are distributed to 4 double words (authorization groups 1-4) with increasing value.</p> <p>Indicates authorization level 64 - 95.</p>
[User administration] Current authorization group 4	UDINT	<p>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.</p> <p>Authorization level 0 corresponds to decimal value $2^0 = 1$ Authorization level 1 corresponds to decimal value $2^1 = 2$ Authorization level 0 and 1 corresponds to decimal value 2^0 and $2^1 = 3$ etc.</p> <p>The 128 possible authorization levels are distributed to 4 double words (authorization groups 1-4) with increasing value.</p> <p>Indicates authorization level 96 - 127.</p>
[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	<p>Displays the number of days until the password of the user currently logged in becomes invalid.</p> <p>The variable has days as a time format. The time duration can be defined in zenon with the Password - period of validity [d] property.</p> <p>Note: If the Password never expires option is activated in Active Directory or, in zenon, the Password - period of validity [d] property is set to 0, then the value 2147483647 is written to the variable.</p>
[User administration] Invalid user name	BOOL	If the value of this variable is 1, the login failed either because of wrong user name or because of a wrong password.

6.9 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.
[Printer] List printer - status	UDINT	Shows the current status of the list printer. Printer_Status_Paused = 0x00000001, Printer_Status_Pending_Deletion=0x00000004
[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. Printer_Status_Paused = 0x00000001, Printer_Status_Pending_Deletion=0x00000004
[Printer] Online printer on/off	BOOL	Status of the online print administration of the Alarm Message List or the Chronological Event List. 0= off 1 = on
[Printer] Screenshot printer - number of print jobs		Current number of waiting print jobs for the configured screenshot printer.
[Printer] Screenshot printer - name		Name of the currently configured screenshot printer.
[Printer] Screenshot printer - status		Shows the current status of the screenshot printer. Printer_Status_Paused = 0x00000001, Printer_Status_Pending_Deletion=0x00000004
[Printer] Who is printing online? AML/CEL	BOOL	Shows for which module the online print is active. 0 = Alarm Message List 1 = Chronological Event List

6.10 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 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. 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. 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. 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 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. 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. 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. Note: The export folder is configured in the project 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. Note: The export folder is configured in the project properties in the File storage property.

6.11 Theme - [network]

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

Name	Data type	Comment
[Network] Current Primary Server	STRING local	Computer name of the current Primary Server 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. 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 local	Computer name of the server which is currently not handling processes. 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. ▶ 0 = operating authorization request accepted ▶ 1 = operating authorization request declined
[Network] Authorization available	BOOL	Shows whether there is an authorization for the current project on the local computer. ▶ 0 = No ▶ 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. 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	<p>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.</p> <p>Note: You can find further information on evaluation in the Network manual in the Configuration of redundancy evaluation chapter.</p>
[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.
[Network] Primary Server <-> Standby Server in data sync	BOOL	<p>A binary variable that takes the value 1 (for a short time) when the system performs a redundancy switch between server and standby server.</p> <ul style="list-style-type: none"> ▶ 0 = no file sync ▶ 1 = file sync active
[Network] Primary Server broke down	BOOL lokal	<p>Indicates that the connection to the process handling server was lost.</p> <p>Depending on the network position of the computer, this means:</p> <ul style="list-style-type: none"> ▶ 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. ▶ 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. <p>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.</p> <p>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.</p>
[Network] Primary Server shut down	BOOL	Indicates the regular stop of the process handling server. The value changes to TRUE if the Primary Server was stopped

	lokal	<p>properly. FALSE if there is a process handling server in the net.</p> <p>Depending on the network position of the computer, this means:</p> <ul style="list-style-type: none"> ▶ Dominant Server: While it is not yet the process handling server, the value changes to TRUE if the process handling server has stopped. ▶ 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. ▶ 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. ▶ 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. 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	<p>Shows the type of the local computer in the network.</p> <ul style="list-style-type: none"> ▶ -1 = Standalone ▶ 0 = Client ▶ 1 = Primary Server ▶ 2 = Standby Server
[Network] Standby Server broke down	BOOL	<p>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.</p> <p>Depending on the network position of the computer, this means:</p> <ul style="list-style-type: none"> ▶ Dominant Server: The variable only acts as described from the time when the standby became the server handling the process. ▶ Non-dominant Server: If, during file synchronization, the connection to a server that is dominant but is not handling the process is interrupted, the value changes to TRUE. Always FALSE if not the server handling the process. ▶ Client: As per server handling the process.

[Network] Standby Server shut down	BOOL	<p>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.</p> <p>Depending on the network position of the computer, this means:</p> <ul style="list-style-type: none"> ▶ Dominant Server: Only from the time when the standby became the server handling the process does the variable act as described. ▶ 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. ▶ Client: As per server handling the process.
[Network] Standby Server started	BOOL	<p>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.</p> <p>Depending on the network position of the computer, this means:</p> <ul style="list-style-type: none"> ▶ Dominant Server: Only from the time when the standby became the server handling the process does the variable act as described. ▶ 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. ▶ 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.
[Network] Switch from Primary Server to Standby Server	BOOL	<p>A binary variable that takes on the value 1 if the server becomes the standby server during a redundancy switch.</p> <ul style="list-style-type: none"> ▶ 0 = registered server is available as server in the network. ▶ 1 = registered server is available as standby server in the network.
[Network] Switch from Standby Server to Primary Server	BOOL	<p>A binary variable that takes on the value 1 if the standby server becomes the server during a redundancy switch.</p> <ul style="list-style-type: none"> ▶ 0 = registered Standby Server is available as standby server in the network. ▶ 1 = registered Standby Server is available as server in the network.

6.12 Theme - [Folder]

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. 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. Graphics are administered in the project tree, in the Files node in the Graphics subfolder. Note: The graphics folder is configured in the General project settings, in the File storage property in the Name/Folder properties group.
[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. Videos are administered in the project tree, in the Files node in the Multimedia subfolder.

6.13 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. Initialization of the counter with Write set value .
[Network statistics] Number of received packets (local)	UDINT	Accumulated number of locally received network packets. 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. 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. 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] Number of received packets per second, maximum (local)	UDINT	Current maximum number of locally received network 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. 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. 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. Initialization of minimum and maximum with Write set value .
[Network statistics] Number of sent packets	UDINT	Current maximum number of sent network packets per

per second, maximum		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 (local)	UDINT	Current minimum number of locally sent network packets per second.
[Network statistics] Pending messages (total)	UDINT	Shows the currently-pending messages in the Windows Message Queue for all projects configured in zenon.
[Network statistics] Pending messages (project)	UDINT	Shows the currently-pending messages in the Windows 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. 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. Initialization of minimum and maximum with Write set value .
[Network statistics] Size of received packets [byte]	UDINT	Accumulated size of received network packets. Initialization of the counter with Write set value .

[Network statistics] Size of received packets [byte] (local)	UDINT	Accumulated size of locally received network packets. Initialization of the counter with Write set value .
[Network statistics] Size of received packets per second, current [byte]	UDINT	Current size of received network packets per second. 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. 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. Initialization of the counter with Write set value .
[Network statistics] Size of sent packets [byte] (local)	UDINT	Accumulated size of locally sent network packets. 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. 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. Initialization of minimum and maximum with Write set value .
[Network statistics] Size of sent packets per second, maximum [byte]	UDINT	Current maximum size of sent network packets per 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	UDINT	Current minimum size of sent network packets per second.

second, minimum [byte]		
[Network statistics] Size of sent packets per second, minimum [byte] (local)	UDINT	Current minimum size of locally sent network packets per second.

6.14 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. 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. 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.
[Driver statistics] Number of received value lists per second, current	UDINT	Current number of received value lists per second. 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. 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. Initialization of minimum and maximum with Write set value .
[Driver statistics] Number of sent requests (local)	UDINT	Cumulated number of locally sent requests. Initialization of minimum and maximum with Write set value .
[Driver statistics] Number of sent set values	UDINT	Accumulated number of sent set-values. Initialization of minimum and maximum with Write set value .
[Driver statistics] Number of sent set values (local)	UDINT	Cumulated number of sent set-values. Initialization of minimum and maximum with Write set value .
[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. 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. Initialization of minimum and maximum with Write set value .
[Driver statistics] Processing time of	UDINT	Average value of processing duration for locally received value lists.

received value lists, average [μs] (local)		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] Processing time of received value lists, minimum [μs]	UDINT	Minimum value of the processing duration for received 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.

6.15 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 back“ 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 <code>zenon6.ini</code> <ul style="list-style-type: none"> ▶ 0 = entry <code>SERIALIZE = 0</code> ▶ 1 = entry <code>SERIALIZE = 1</code>
[Project summary] Flashing rate [ms]	UDINT	Shows the currently-configured time for the blinking intervals for displaying limit value violations. 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. <ul style="list-style-type: none"> ▶ 0 = Set value input OK ▶ 1 = Set value input unsuccessful <p>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.</p> <p>The value changes if a value higher or lower than the one set by an element or a screen of type Keyboard is entered.</p> <p>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.</p>
[Project summary] Functions On/Off	BOOL	Shows the current status of the zenon function administration. <ul style="list-style-type: none"> ▶ 0 = Function administration is inactive ▶ 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. <ul style="list-style-type: none"> ▶ 0 = Function logging is deactivated ▶ 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. <ul style="list-style-type: none"> ▶ 0 = Action execution permitted ▶ 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. <ul style="list-style-type: none"> ▶ 3 = zenon ▶ 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 (main.chm::/32632.htm).
[Project summary] Send message active	BOOL	Displays whether function Send message is active. <ul style="list-style-type: none"> ▶ 0 = Send message function inactive ▶ 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. 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 <code>Display value as text</code> or the function <code>Set point input for keyboard screen</code> .
[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] Driver queue overflow	BOOL	Shows whether there is a queue overflow in a driver that has been configured in zenon. <ul style="list-style-type: none"> ▶ 0 = No queue overflow occurred ▶ 1 = A queue overflow occurred
[Project summary] Driver queue overflow (name)	STRING	Displays the name of the driver for which the queue overflow occurred. The variable is updated when this system driver variable occurs.
[Project summary] Variable for last set value input	STRING	Displays the name of the variable with the last successful set value action.
[Project summary] Variable for set value input	STRING	Displays the name of the variable that is currently open for the set value action.

[Project summary] Version of the Runtime files	STRING	Shows the zenon version, for which the current project was created.
[Project summary] Last opened screen	STRING	<p>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).</p> <p>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.</p>

6.16 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	<p><i>States that an RGM function (including RGM screen functions) is being executed or has been ended:</i></p> <ul style="list-style-type: none"> ▶ -1: is being executed ▶ 0: Initialization value read successfully ▶ 1: Error: User has no authorization ▶ 2: Error: No authorization in the network ▶ 3: Error: Cancellation by the user ▶ 4: Error: Error - could not read everything successfully, e.g. <ul style="list-style-type: none"> - Communication with the hardware is interrupted before read was started - a data block is not available on the PLC - Error during transmission ▶ 5: Error: Error during save of the recipe file ▶ 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	<p>Displays if the import is currently active and whether the import was concluded with or without errors.</p> <p>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 has ended. In addition, all errors that have occurred can be viewed in the CEL with additional information, such as the recipe concerned.</p> <p>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.</p> <p><u>General messages:</u></p> <ul style="list-style-type: none"> ▶ 0: Undefined status (no import has been carried out yet) ▶ 1: Import was started and is currently in progress

		<ul style="list-style-type: none"> ▶ 2: Import was concluded without an error <p><u>General error:</u></p> <ul style="list-style-type: none"> ▶ 3: No file selected. ▶ 4: Unknown XML-structure ▶ 5: Import file is not present. ▶ 6: The export file does already exist and should not be overwritten. ▶ 7: The writing of the export file was unsuccessful. ▶ 19: General error with text description. <p>(8 - 18: not in use)</p> <p><u>RGM-specific error:</u></p> <ul style="list-style-type: none"> ▶ 20: A new recipe could not be created. ▶ 21: The settings of a recipe cannot be imported (for example, time-out for synchronous writing, ...). ▶ 22: The RGM data could not be accessed. ▶ 23: A new recipe group could not be created. ▶ 24: The variables or recipes of a recipe group cannot be imported correctly. ▶ 25: Group selection is missing for the import of an individual recipe. ▶ 26: The recipe group selected for the import of individual recipes is not present. ▶ 27: Error when creating variables in the group. ▶ 28: Error when importing the recipe group settings (comments, for example). ▶ 29: Error when importing the variable settings (the minimum and maximum value, for example). ▶ 30: The recipe group could not be imported. ▶ 31: The data of the selected recipe group for the import of individual recipes could not be loaded.
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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 (main.chm::/32418.htm). 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 (global/local) ----- [Recipes: Standard and RGM] RGM write graphic recipe variables - result (global/local)	UDINT	Variable receives the value 0 as long as a recipe is written locally. Value becomes 1 if the recipe has been completely written. (After starting the Runtime, the variable also has the value 0) Values for write operation. <ul style="list-style-type: none"> ▶ 0: Send initialization value before the recipe. ▶ 1: Writing was completed successfully and has ended. ▶ 2: Writing was not carried out due to a general error (parameter). ▶ 3: Writing was completed successfully and has ended. ▶ 5: Write terminated, for example because RT is being ended. ▶ 6: time expired (time-out).
[Recipes: Standard and RGM] Last written standard recipe/RGM recipe (lglobal/ocal) ----- [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) ----- [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 written RGM recipe number (global/local) ----- [Recipes: Standard and RGM] RGM write graphic recipe variables - recipe number (global/local)	UDINT	Shows the recipe number of the last RGM recipe sent, globally or locally
[Recipes: Standard and RGM] RGM last written recipe - authorization (global/local) ----- [Recipes: Standard and RGM] RGM	DINT	Authorization level of the last recipe written.

write graphic recipe variables - authorization (global/local)		
[Recipes: Standard and RGM] RGM last written recipe - operator, last change (global/local) ----- [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) ----- [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) ----- [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 (global/local) ----- [Recipes: Standard and RGM] RGM write graphic recipe variables - recipe status text (global/local)	STRING	Status of the last recipe sent as text in 1 - @Text format.
[Recipes: Standard and RGM] RGM last written recipe - recipe version (global/local) ----- [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) ----- [Recipes: Standard and RGM] RGM write graphic recipe variable - time,	STRING	Time of the last recipe change of the last recipe written.

last change (global/local)		
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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 (main.chm::/32418.htm). 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) ----- [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: <ul style="list-style-type: none"> ▶ 0: Set before the reading and only changes when the reading process is done. ▶ 1: Finished reading successfully. ▶ 2: During reading an error not defined in greater detail has occurred. ▶ 3: During reading at least one variable has status INVALID (main.chm::/24148.htm). ▶ 4: At least one value is not within the min-max limits. ▶ 5: During reading a timeout (30000 + 100*VarCount in [ms]) occurred.
[Recipes: Standard and RGM] RGM last read recipe - authorization (global/local) ----- [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) ----- [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) ----- [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) -----	STRING	Name of the recipe group name of the recipe read last.

[Recipes: Standard and RGM] RGM read graphic recipe variables - recipe group name (global/local)		
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[Recipes: Standard and RGM] RGM last read recipe - recipe name (global/local) ----- [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) ----- [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) ----- [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) ----- [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) ----- [Recipes: Standard and RGM] RGM read graphic recipe variables - recipe version (global/local)	DINT	Version of the last recipe read.
[Recipes: Standard and RGM] RGM last recipe read - time, last change (global/local) ----- [Recipes: Standard and RGM] RGM read graphic recipe variables - time,	STRING	Time of the last recipe change of the last recipe read.

last change (global/local)		
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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.
[Recipes: Standard and RGM] RGM last selected recipe - recipe status text (local)	STRING	Contains the status of the last selected recipe as text. 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: [Variable name; recipe value; variable value; unit] each entry is written in a new line. Requirement: Variable RGM recipe value

		<p>check - result has a value = 1.</p> <p>Attention: Variable can either be created and evaluated globally or locally.</p>
[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	<p>Result of the check:</p> <ul style="list-style-type: none"> ▶ 0: All value match. ▶ 1: At least one variable value deviates from the recipe value. ▶ 2: At least one variable is faulty (INVALID). ▶ 3: Checking is not possible, because the column for the current value is not displayed. System driver variable is reset. <p>Error messages:</p> <ul style="list-style-type: none"> ▶ -1: An error while reading the variable value occurred. ▶ -2: The recipe group could not be opened. ▶ -3: The recipe could not be changed. <p>Attention: Variable can either be created and evaluated globally or locally.</p>
[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	<p>Name of the recipe group of the recipe checked last.</p> <p>Requirement: Variable RGM recipe value check - result has a value ≥ -1.</p> <p>Attention: Variable can either be created and evaluated globally or locally.</p>
[Recipes: Standard and RGM] RGM check recipe values - recipe name (global/local)	STRING	<p>Name of the recipe checked last.</p> <p>Requirement: Variable RGM recipe value check - result has a value ≥ -1.</p> <p>Attention: Variable can either be created and evaluated globally or locally.</p>
[Recipes: Standard and RGM] RGM check recipe values - recipe number	UDINT	<p>Number of the recipe checked last.</p> <p>Requirement: Variable RGM recipe value</p>

(global/local)		check - result has a value ≥ -1 . Attention: Variable can either be created 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.

6.17 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	<p>Number of command sequences with pending user interaction that are currently running.</p> <p>If the operation has been executed or the command sequence has been completed, the numeric value is reduced by 1.</p> <p>If several steps are waiting for an operation in a command sequence, the numeric variable is incremented for each step.</p>
[Command Sequencer] Number of running command sequences	DINT	<p>Number of command sequences currently running.</p> <p>The system variable is updated both at the start and end of a command sequence.</p>
[Command Sequencer] Export result numeric	DINT	<p>Result of the XML export:</p> <ul style="list-style-type: none"> ▶ -1: is being executed ▶ 0: Initialization value read successfully ▶ from 1: Number of errors that occurred
[Command Sequencer] Export result string	STRING	<p>Result of the XML export as a text.</p> <ul style="list-style-type: none"> ▶ No errors occurred. ▶ XML export error: The export file [save location]\[File Name] already exists and must not be overwritten. 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	<p>Detailed content of the XML export.</p> <p>This variable visualizes the content of the XML export. The following are displayed:</p> <ul style="list-style-type: none"> ▶ Name ▶ Version ▶ Type ▶ ID <p>Note: If the content exceeds the maximum length of the system driver variable, the result is shortened.</p>

Name	Data Type	Comment
[Command Sequencer] Import result numeric	DINT	<p>Result of the XML import:</p> <ul style="list-style-type: none"> ▶ -1: is being executed ▶ 0: Initialization value read successfully ▶ from 1: Number of errors that occurred
[Command Sequencer] Import result string	STRING	<p>Result of the XML import as a text:</p> <ul style="list-style-type: none"> ▶ The command sequence was not found. The command sequence therefore cannot be imported. ▶ The command sequence could not be overwritten due to an incorrect status. ▶ The command sequence cannot be imported as a new version. The versioning is not active. ▶ The command sequence could not be imported. It does not match the selected type. ▶ The command sequence could not be imported because the name is not permissible.
[Command Sequencer] Import result XML	STRING	<p>Detailed content of the XML import.</p> <p>This variable visualizes the content of the XML export. The following are displayed:</p> <ul style="list-style-type: none"> ▶ Name ▶ Version ▶ Type ▶ ID <p>Note: If the content exceeds the maximum length of the system driver variable, the result is shortened.</p>
[Command Sequencer] Name of the active taached command sequence	STRING	<p>Name of the command sequence that is currently being taught. The command sequence names are used once the teaching process has been started.</p> <p>If a teaching process has been completed, the value of this variable switches to empty.</p>

Name	Data Type	Comment
[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 sequences with pending user interaction	STRING	Names of command sequences running with user interactions pending. 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. 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. <ul style="list-style-type: none"> ▶ 0 - Teaching is not active. ▶ 1 - Teaching cursor waits for positioning (this status is active until the teaching cursor in the command sequences editor has been placed) ▶ 2 - Teaching is active. <p>This variable has the value 2 in the event of an ongoing teaching process.</p> <p>If a teaching process has been completed, the value of this variable switches to 0.</p>



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).

6.18 Theme - [System information]

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

Name	Data type	Comment
[System summary] Harddisk data storage active/inactive	BOOL	Displays whether the hard-disk data storage of the variables in zenon is activated. 0 = HDD administration is inactive 1 = HDD administration is active
[System summary] Local system variable: DWORD 1-4	UDINT	A local variable that are is updated in the network. The values for these variables can be stipulated in the <code>zenon6.ini</code> file and they can thus be used as constants on the respective computer
[System summary] Computer name	STRING	Shows the name of the local computer.
[System summary] Runtime folder not available	BOOL	Checks whether the data directory of the Runtime is available. Upon a negative result, the Runtime will no longer try to perform read or write access on the directory. 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 summary] Runtime status (simulation)	DINT	Displays the current status of the Runtime. The following values are available for the variable: <ul style="list-style-type: none"> ▶ 0 : Process connection ▶ 1: Switch to process connection in simulation ▶ 2: Change to simulation with process connection ▶ 3: In simulation ▶ 4: Change the simulation image during simulation
[System summary] 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 <code>project.ini</code> . Example: For example, to update the variable every 5 seconds, add <code>UPDATE_SEK=5</code> to the [Systemtreiber] area in <code>zenon6.ini</code> .

6.19 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 (main.chm::/13028.htm) manual in the Variables (main.chm::/13045.htm) section.

6.19.1 XML import

For the import/export of variables the following is true:

- ▶ The import/export must not be started from the global project.
- ▶ The start takes place via:
 - Context menu of variables or data typ in the project tree
 - or context menu of a variable or a data type
 - or symbol in the symbol bar variables



Attention

When importing/overwriting an existing data type, all variables based on the existing data type are changed.

Example:

There is a data type XYZ derived from the type `INT` with variables based on this data type. The XML file to be imported also contains a data type with the name XYZ but derived from type `STRING`. If this data type is imported, the existing data type is overwritten and the type of all variables based on it is adjusted. I.e. the variables are now no longer `INT` variables, but `STRING` variables.

6.19.2 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 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 export 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. The length can be limited using the MAX_LAENGE entry in project.ini .
KANAL_R	C	128	The original name of a variable that is to be replaced by the new name entered under "VARIABLENNAME" (field/column must be entered manually). The length can be limited using the MAX_LAENGE entry in project.ini .
KANAL_D	Log	1	The variable is deleted with the 1 entry (field/column has to be created by hand).
TAGNR	C	128	Identification. The length can be limited using the MAX_LAENGE entry in project.ini .
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	Bus 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 For byte variables: 0=lower, 8=higher byte For string variables: Length of string (max. 63 characters)
ARRAYSIZE	N	16	Number of variables in the array for index variables 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 0: Not allowed to set value. 1: Allowed to set value.
MIT_ZEIT	L	1	time stamp in zenon (only if supported by the driver)
OBJEKT	N	2	Driver-specific ID number of the primitive object comprises TREIBER-OBJEKTYP 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) 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	L	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	L	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. Free string for export and display in lists. The length can be limited using the MAX_LAENGE entry in project.ini .
ADJWVBA	L	1	Non-linear value adaption: 0: Non-linear value adaption is used 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	L	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) (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	L	1	Set blink attribute
BTB1	L	1	Logging in CEL
ALARM1	L	1	Alarm
DRUCKEN1	L	1	Printer output (for CEL or Alarm)
QUITTIER1	L	1	Must be acknowledged
LOESCHE1	L	1	Must be deleted
VARIABLE1	L	1	Dyn. limit value linking the limit is defined by an absolute value (see field GRENZWERTx).
FUNC1	L	1	Functions linking
ASK_FUNC1	L	1	Execution via Alarm Message List
FUNC_NR1	N	10	ID number of the linked function (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	L	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.
UPDATE_SEK =	Cycle time of the system driver in seconds
[LOCAL_VAR]	Entries for the system driver variables.
ID_DWORD_1 = <Wert> ID_DWORD_2 = <Wert> ID_DWORD_3 = <Wert> ID_DWORD_4 = <Wert>	These entries deliver the values for the system driver variables System info -> Local system variable: DWORD1-4. 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. By default, limit values can be defined for each of these variables. If there are no entries in the zenon.ini file, the values of these variables will be set to 0 in zenon in Runtime.

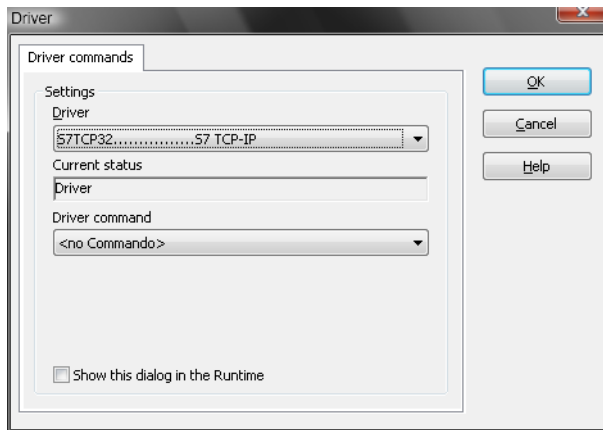
8. Driver commands

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.

Driver commands are used to influence drivers using zenon; start and stop for example. The engineering is implemented with the help of function **Driver commands**. To do this:

- ▶ create a new function
- ▶ select Variables -> Driver commands

- The dialog for configuration is opened



Parameter	Description
Drivers	Drop-down list with all drivers which are loaded in the project.
Current status	Fixed entry which has no function in the current version.
Driver command	Drop-down list for the selection of the command.
▶ Start driver (online mode)	Driver is reinitialized and started.
▶ Stop driver (offline mode)	Driver is stopped. No new data is accepted. Note: If the driver is in offline mode, all variables that were created for this driver receive the status <code>switched off</code> (OFF; Bit 20).
▶ Driver in simulation mode	Driver is set into simulation mode. 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. For the variables of the driver the values from the connected hardware (e.g. PLC, bus system, ...) are displayed.
▶ Driver-specific command	Enter driver-specific commands. Opens input field in order to enter a command.
▶ Driver - activate set setpoint value	Write set value to a driver is allowed.
▶ Driver - deactivate set setpoint value	Write set value to a driver is prohibited.
▶ Establish connecton with modem	Establish connection (for modem drivers) Opens the input fields for the hardware address and for the telephone number.
▶ Disconnect from modem	Terminate connection (for modem drivers)
Show this dialog in the Runtime	The dialog is shown in Runtime so that changes can be made.

DRIVER COMMANDS IN THE NETWORK

If the computer, on which the **driver command** function is executed, is part of the zenon network, additional actions are carried out. A special network command is sent from the computer to the project server, which 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 (main.chm::/12464.htm) program that was also installed with zenon. You can find it under Start/All programs/zenon/Tools 7.50 -> Diagviewer.

zenon driver log all errors in the LOG files. The default folder for the LOG files is subfolder **LOG** in directory `ProgramData`, example:

```
%ProgramData%\COPA-DATA\LOG. LOG files are text files with a special structure.
```

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 (main.chm::/12464.htm) manual.