



zenon
by COPA-DATA

zenon driver manual stratonNG

v.8.20



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Contents

| | | |
|----------|---|-----------|
| 1 | Welcome to COPA-DATA help | 4 |
| 2 | stratonNG..... | 4 |
| 3 | stratonNG - data sheet..... | 5 |
| 4 | Driver history..... | 6 |
| 5 | Configuration | 7 |
| 5.1 | Creating a driver..... | 8 |
| 5.2 | Settings in the driver dialog | 11 |
| 5.2.1 | General | 12 |
| 5.2.2 | Options..... | 16 |
| 5.2.3 | Connections | 17 |
| 6 | Creating variables | 20 |
| 6.1 | Creating variables in the Editor | 20 |
| 6.2 | Addressing..... | 24 |
| 6.3 | Driver objects and datatypes | 26 |
| 6.3.1 | Driver objects..... | 26 |
| 6.3.2 | Mapping of the data types..... | 27 |
| 6.4 | Creating variables by importing..... | 29 |
| 6.4.1 | XML import..... | 29 |
| 6.4.2 | DBF Import/Export..... | 30 |
| 6.4.3 | Online import | 35 |
| 6.5 | Communication details (Driver variables)..... | 37 |
| 7 | Driver-specific functions | 43 |
| 8 | Driver command function..... | 45 |
| 9 | Error analysis | 50 |
| 9.1 | Analysis tool..... | 50 |
| 9.2 | Driver monitoring | 51 |
| 9.3 | Check list..... | 52 |

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 stratonNG

The driver is used for connecting on or more zenon Logic controls via a TCP/IP connection.

The following items should be considered for the communication and configuration:

- ▶ Array variables that are based on the stratonNG driver must not start with 1. This means: A zenon array with dimensions 1,2,2 is created as a simple variable in zenon Logic.
- ▶ A maximum of 255 events can be transmitted per cycle.

3 stratonNG - data sheet

| General: | |
|------------------|--|
| Driver file name | stratonNG.exe |
| Driver name | straton NG driver |
| PLC types | Controllers based on the straton VMTK, stratonRT / zenonLogic RT |
| PLC manufacturer | Brodersen; Wago; straton; COPA-DATA |

| Driver supports: | |
|--------------------------------------|------------|
| Protocol | TCP/IP |
| Addressing: Address-based | Name based |
| Addressing: Name-based | -- |
| Spontaneous communication | X |
| Polling communication | X |
| Online browsing | X |
| Offline browsing | -- |
| Real-time capable | X |
| Blockwrite | X |
| Modem capable | -- |
| RDA numerical | X |
| RDA String | -- |
| Hysteresis | X |
| extended API | X |
| Supports status bit WR-SUC | X |
| alternative IP address | X |

| 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 |
|-----------|----------------|-------------------------------------|
| 1/9/2010 | 100 | Driver was created newly |
| 3/16/2010 | 200 | Driver configuration designed newly |

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

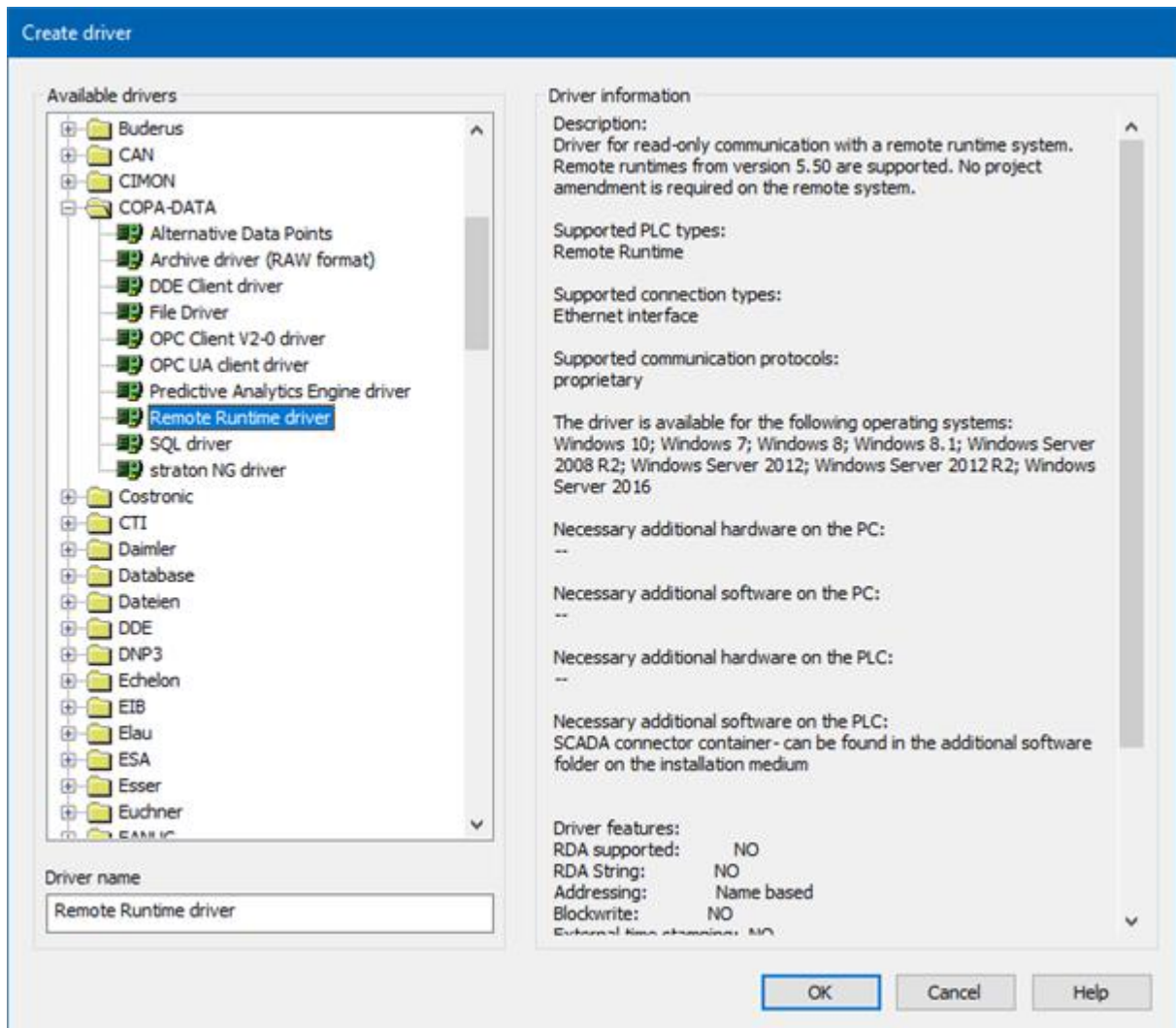
In this chapter you will learn how to use the driver in a project and which settings you can change.

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

| Parameter | Description |
|---------------------------|--|
| | Identification after selecting a driver from the list of available drivers. |
| Driver information | Further information on the selected driver. Default: <i>empty</i> 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

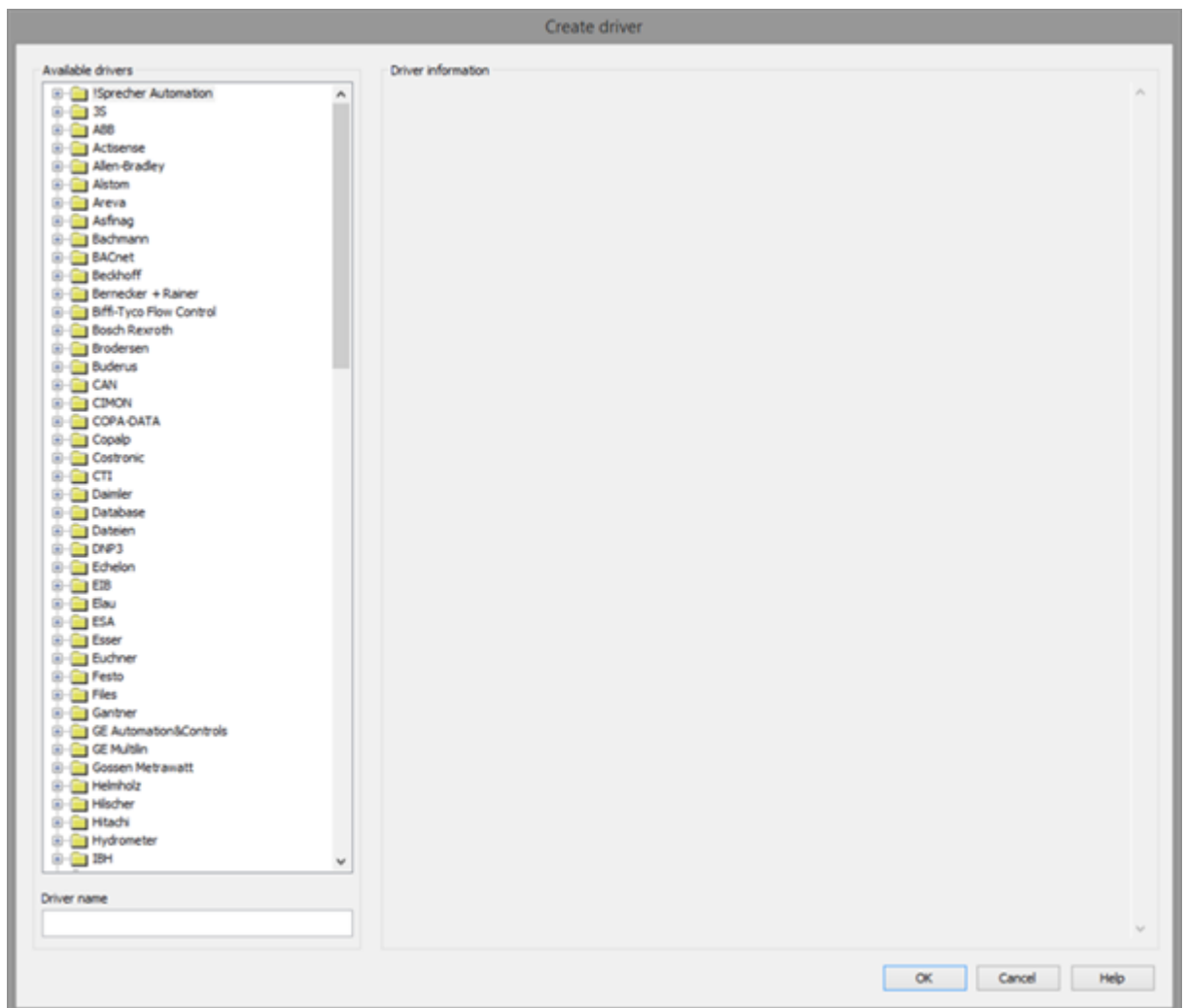
In order to create a new driver:

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.

- The dialog offers a list of all available drivers.



- 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.

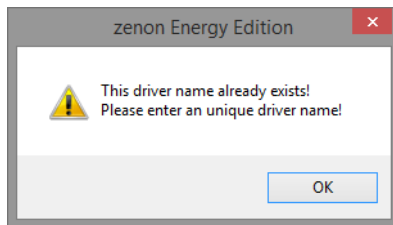
The following is applicable for the **Driver name**:

 - ▶ 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.
- 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

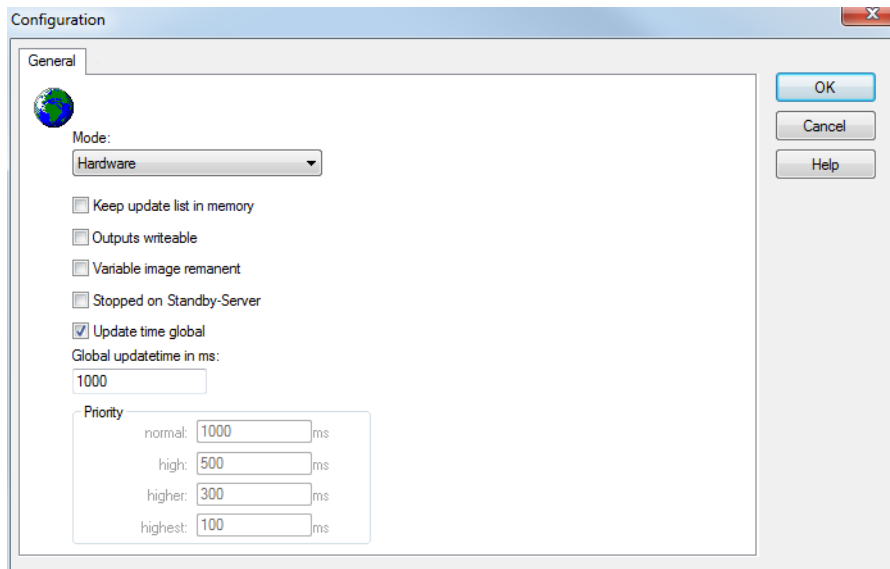
Only the required drivers need to be present in a zenon project. Drivers can be added at a later time if required.

5.2 Settings in the driver dialog

You can change the following settings of the driver:

5.2.1 General

The configuration dialog is opened when a driver is created. In order to be able to open the dialog later for editing, double click on the driver in the list or click on the **Configuration** property.



| Option | Description |
|-------------|--|
| Mode | <p>Allows to switch between hardware mode and simulation mode</p> <ul style="list-style-type: none"> ▶ <i>Hardware:</i> A connection to the control is established. ▶ <i>Simulation - static:</i> No communication between to the control is established, the values are simulated by the driver. In this modus the values remain constant or the variables keep the values which were set by zenon Logic. Each variable has its own memory area. E.g. two variables of the type marker with offset 79 can have different values in the Runtime and do not influence each other. Exception: The simulator driver. ▶ <i>Simulation - counting:</i> No communication between to the control is established, the values are simulated by the driver. In this modus the driver increments the values within a value range automatically. ▶ <i>Simulation - programmed:</i> No communication is established to the PLC. The |

| Option | Description |
|---------------------------------------|--|
| | <p>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 a zenon Logic Runtime which is integrated in the driver.</p> <p>For details see chapter Driver simulation.</p> |
| Keep update list in the memory | <p>Variables which were requested once are still requested from the control even if they are currently not needed. This has the advantage that e.g. multiple screen switches after the screen was opened for the first time are executed faster because the variables need not be requested again. The disadvantage is a higher load for the communication to the control.</p> |
| Output can be written | <ul style="list-style-type: none"> ▶ <i>Active:</i> Outputs can be written. ▶ <i>Inactive:</i> Writing of outputs is prevented. <p>Note: Not available for every driver.</p> |
| Variable image remanent | <p>This option saves and restores the current value, time stamp and the states of a data point.</p> <p>Fundamental requirement: The variable must have a valid value and time stamp.</p> <p>The variable image is saved in hardware mode if one of these statuses is active:</p> <ul style="list-style-type: none"> ▶ User status <i>M1 (0) to M8 (7)</i> ▶ <i>REVISION(9)</i> ▶ <i>AUS(20)</i> ▶ <i>ERSATZWERT(27)</i> <p>The variable image is always saved if:</p> <ul style="list-style-type: none"> ▶ the variable is of the Communication details object type ▶ the driver runs in simulation mode. (not programmed simulation) <p>The following states are not restored at the start of the Runtime:</p> |

| Option | Description |
|-------------------------------|---|
| | <ul style="list-style-type: none"> ▶ <i>SELECT(8)</i> ▶ <i>WR-ACK(40)</i> ▶ <i>WR-SUC(41)</i> <p>The mode Simulation - programmed at the driver start is not a criterion in order to restore the remanent variable image.</p> |
| Stop on Standby Server | <p>Setting for redundancy at drivers which allow only one communication connection. For this the driver is stopped at the Standby Server and only started at the upgrade.</p> <p>Attention: If this option is active, the gapless archiving is no longer guaranteed.</p> <ul style="list-style-type: none"> ▶ <i>Active:</i> Sets the driver at the not-process-leading Server automatically in a stop-like state. In contrast to stopping via driver command, the variable does not receive status switched off but an empty value. This prevents that at the upgrade to the Server irrelevant values are created in the AML, CEL and Historian. <p>Default: <i>inactive</i></p> <p>Note: Not available if the CE terminal serves as a data server. You can find further information in the zenon Operator manual in the CE terminal as a data server chapter.</p> |
| Global Update time | <p>Setting for the global update times in milliseconds:</p> <ul style="list-style-type: none"> ▶ <i>Active:</i> The set Global update time is used for all variables in the project. The priority set at the variables is not used. ▶ <i>Inactive:</i> The set priorities are used for the individual variables. <p>Exceptions: Spontaneous drivers ignore this option. They generally use the shortest possible update time. For details, see the Spontaneous driver update time section.</p> |

| Option | Description |
|-----------------|---|
| Priority | <p>The polling times for the individual priority classes are set here. All variables with the according priority are polled in the set time.</p> <p>The variables are allocated separately in the settings of the variable properties.</p> <p>The communication of the individual variables can be graded according to importance or required topicality using the priority classes. Thus the communication load is distributed better.</p> <p>Attention: Priority classes are not supported by each driver, e.g. spontaneously communicating zenon drivers.</p> |

CLOSE DIALOG

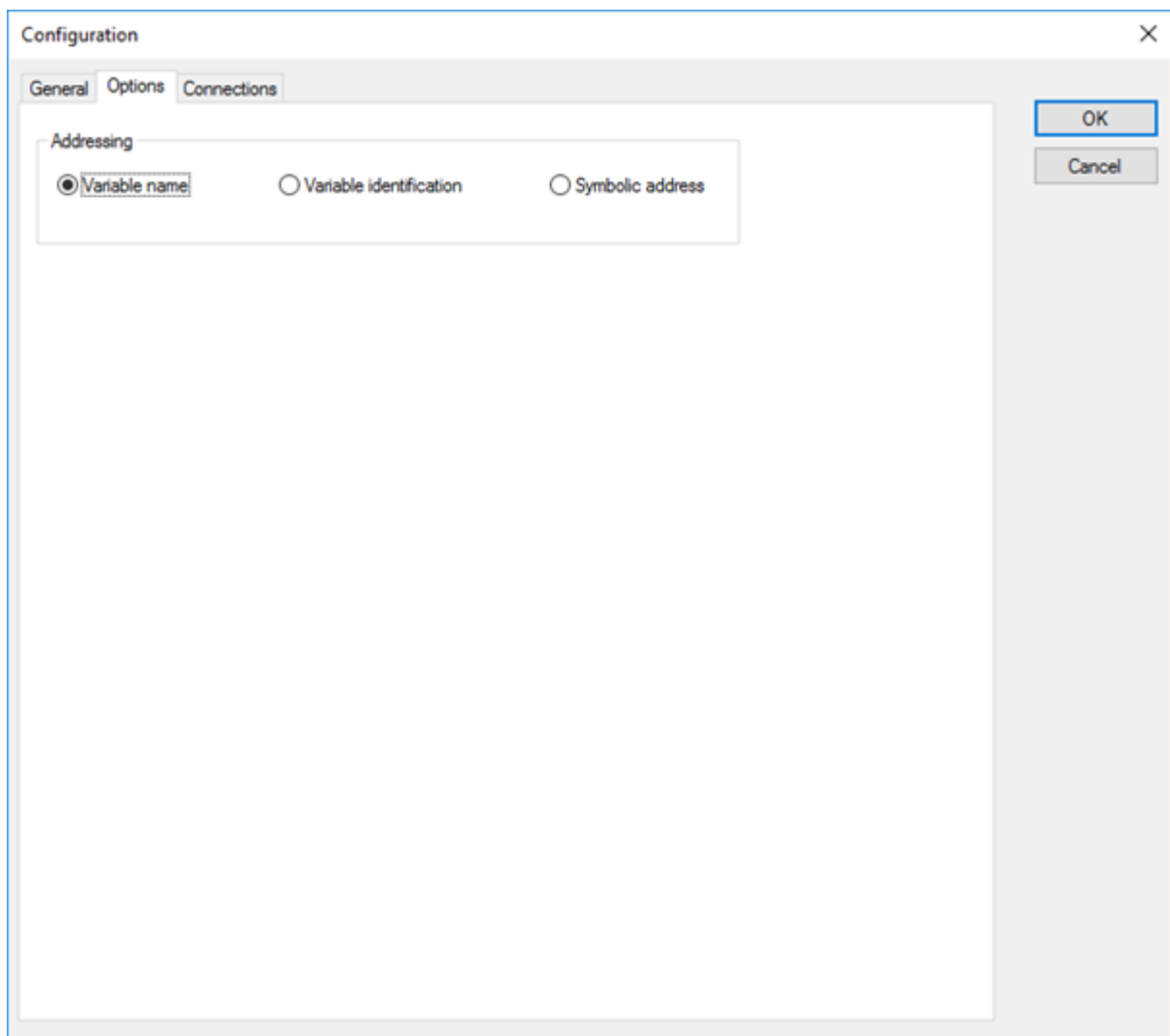
| Option | Description |
|---------------|---|
| OK | Applies all changes in all tabs and closes the dialog. |
| Cancel | Discards all changes in all tabs and closes the dialog. |
| Help | Opens online help. |

UPDATE TIME FOR SPONTANEOUS DRIVERS

With spontaneous drivers, for **Set value, advising** of variables and **Requests**, a read cycle is triggered immediately - regardless of the set update time. This ensures that the value is immediately available for visualization after writing. The update time is generally 100 ms.

Spontaneous drivers are **ArchDrv**, **BiffiDCM**, **BrTcp32**, **DNP3**, **Esser32**, **FipDrv32**, **FpcDrv32**, **IEC850**, **IEC870**, **IEC870_103**, **Otis**, **RTK9000**, **S7DCOS**, **SAIA_Slave**, **STRATON32** and **Trend32**.

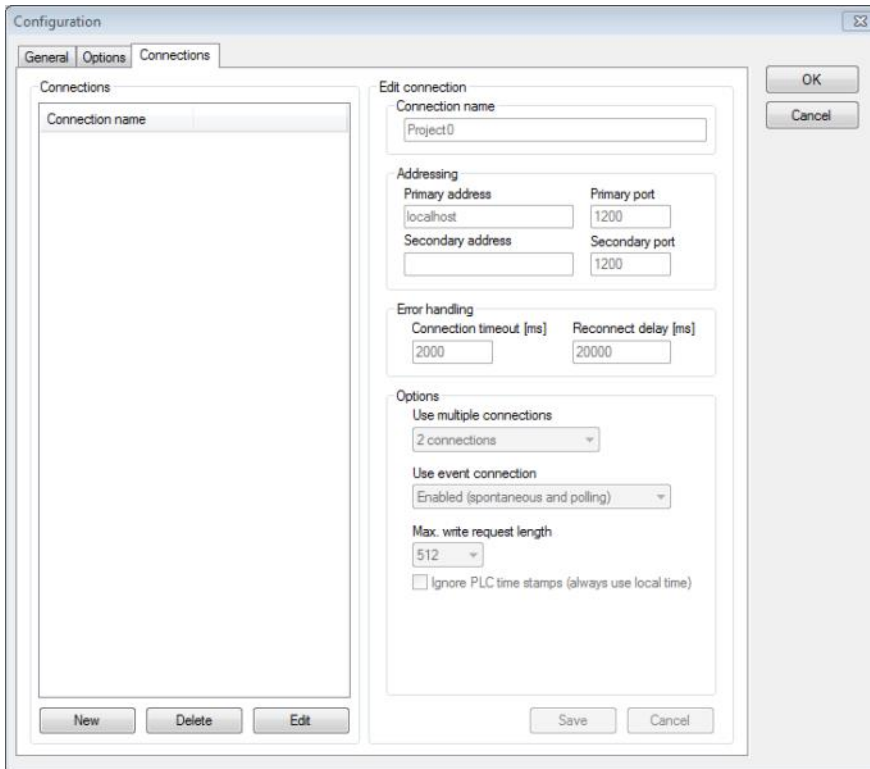
5.2.2 Options



| Parameter | Description |
|-------------------|--|
| Addressing | <p>Selection by means of radio buttons:</p> <ul style="list-style-type: none"> ▶ <i>Variable name:</i> Corresponds to the Name variable property in the zenon Editor. ▶ <i>Variable identification:</i> Corresponds to the Identification variable property in the zenon Editor. ▶ <i>Symbolic address:</i> Corresponds to the Symbolic address variable property in the zenon Editor. |

5.2.3 Connections

LIST OF THE CONNECTIONS AND CONNECTION-SPECIFIC SETTINGS



The screenshot shows the 'Configuration' dialog box with the 'Connections' tab selected. On the left, there is a list box labeled 'Connections' with a header 'Connection name'. Below it are buttons for 'New', 'Delete', and 'Edit'. On the right, the 'Edit connection' panel is active, showing fields for 'Connection name' (set to 'Project0'), 'Addressing' (Primary address: 'localhost', Primary port: '1200', Secondary address: empty, Secondary port: '1200'), 'Error handling' (Connection timeout [ms]: '2000', Reconnect delay [ms]: '20000'), and 'Options' (Use multiple connections: '2 connections', Use event connection: 'Enabled (spontaneous and polling)', Max. write request length: '512', and a checkbox for 'Ignore PLC time stamps (always use local time)' which is unchecked). At the bottom right of the dialog are 'OK' and 'Cancel' buttons, and at the bottom of the 'Edit connection' panel are 'Save' and 'Cancel' buttons.

| Property | Description |
|------------------------|--|
| Connections | Connection data. |
| Connection name | Lists all configured connections. |
| New | Add a new connection to the list. |
| Delete | Delete the selected connection from the list. |
| Edit | Delete the selected connection. |
| Edit Connection | Connection settings for a new connection or the connection selected under Connections . |
| Connection name | Lists all configured connections. |
| Primary address | Address of the PLC (IP address or host name). |
| Primary port | TCP port Default: 1200 |

| Property | Description |
|-----------------------------------|---|
| Secondary address | <p>Address of the secondary connection to the PLC (IP address or host name).</p> <p>If the first connection cannot or cannot be longer reached, it tries to reach the second address. At successful connection establishment this address is used for communication. Only after a renewed connection breakup or a driver restart, a connection to the primary address is tried again.</p> |
| Secondary port | <p>Secondary TCP port</p> <p>Default: 1200</p> |
| Error handling | Error treatment. |
| Communication timeout [ms] | <p>Communication time out.</p> <p>If the controller is not contacted within the set time, all variables are set to the status of <i>Invalid</i>. A renewed connection try ensues only after the set delay time (Reconnect delay) after a connection breakup.</p> <p>Default: 2000</p> |
| Reconnect delay [ms] | <p>Reconnect delay after connection loss (Communication timeout).</p> <p>After a connection error the set time period is waited until a new connection try is started.</p> <p>Default: 20000</p> |
| Options | Options. |
| Use multiple connections | <p>Defines if several TCP connections should be established to the control in order to make a fast communication possible.</p> <ul style="list-style-type: none"> ▶ No (single connection): No multi-connections ▶ 2 connections: 2 connections ▶ - > up to 16 connections possible <p>Default: 2 connections</p> <p>Attention: How many simultaneous connections are supported by a zenon Logic Runtime depends on the zenon Logic Runtime. Note: If several drivers or the</p> |

| Property | Description |
|----------------------------------|--|
| | <p>Workbench try to connect to the Runtime at the same time, all drivers and the Workbench must share the available connections.</p> <p>The COPA-DATA Runtime supports 16 simultaneous connections.</p> |
| Use event connection | <p>States if an event connection should be established to the zenon Logic Runtime.</p> <ul style="list-style-type: none"> ▶ Enabled (spontaneous and polling): Activate event connection; variables can be polled or read via events. ▶ Disabled (polling only): Event connection deactivated; variables can only be polled. <p>Default: <i>Enabled (spontaneous and polling)</i></p> <p>If event mode is activated the status bits of a zenon Logic variable (if available) are transferred to the zenon variable. Transferred are:</p> <ul style="list-style-type: none"> ▶ I-Bit ▶ Bits 32 to 63 |
| Max. write request length | <p>Maximum length of a write request in byte.</p> <ul style="list-style-type: none"> ▶ 512: 512 bytes ▶ 1024: 1024 bytes <p>The longer a write request the more data can be transferred with one request and the faster larger amounts of values can be written.</p> <p>Attention: All connections share a 1024 byte buffer in the zenon Logic Runtime. In this buffer the write commands are cached. If write requests with a length of up to 1024 bytes are used, it is not possible to send write commands via several connections (several drivers, Workbench) simultaneously.</p> <p>Default: <i>512</i></p> <p>Note: If strings with a length of more than 245 characters are used, the Max. write request length must be set to <i>1024</i>.</p> |

| Property | Description |
|---|--|
| Password | <p>Allows zenon to access the Runtime of a zenon Logic project which is protected by a password.</p> <p>zenon and zenon Logic only communicate under certain circumstances:</p> <ul style="list-style-type: none"> ▶ The same password is used in zenon Logic as in the stratonNG driver. ▶ A password is not used in either zenon Logic or in the stratonNG driver. ▶ A password is used in the stratonNG driver but not in zenon Logic. <p>Note: The password can be entered in zenon Logic under Project, Parameter..., Compiler and Runtime Password.</p> |
| Ignore PLC time stamps (always use local time) | <i>Active:</i> Time stamps which are sent by the zenon Logic Runtime are ignored. The time stamps of zenon are set. |
| Save | Saves changes. |
| Cancel | Discards changes. |

6 Creating variables

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

6.1 Creating variables in the Editor

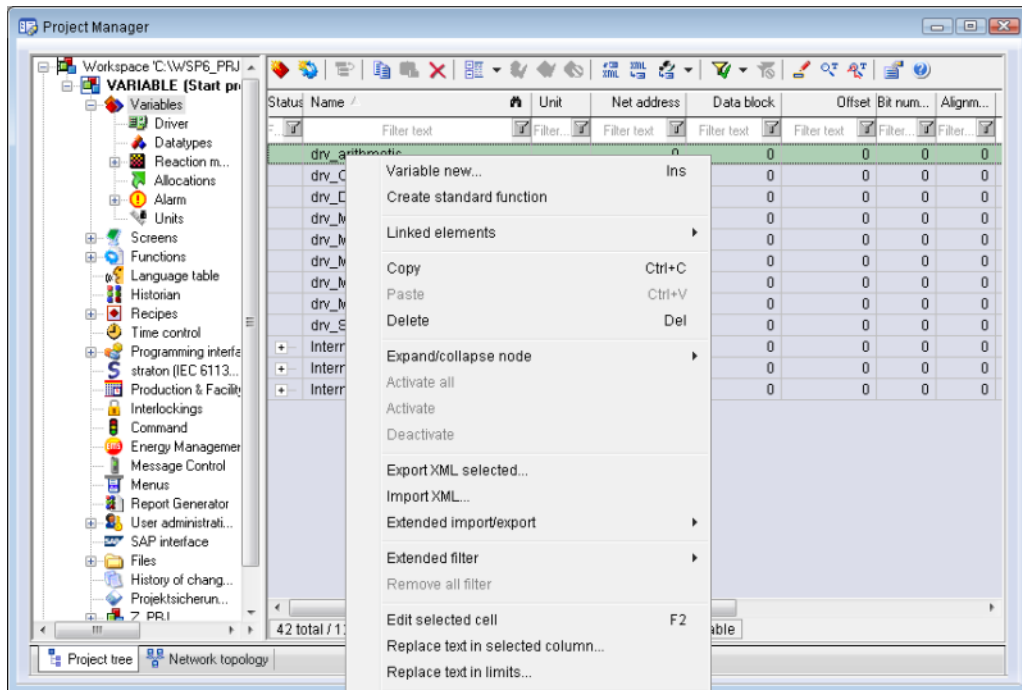
Variables can be created:

- ▶ as simple variables
- ▶ in arrays
- ▶ as structure variables

VARIABLE DIALOG

To create a new variable, regardless of which type:

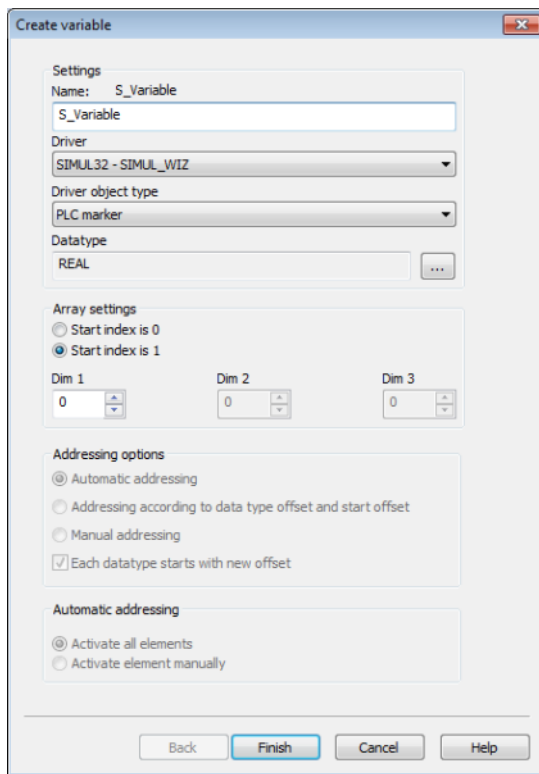
1. Select the **New variable** command in the **Variables** node in the context menu



The dialog for configuring variables is opened

2. Configure the variable
3. The settings that are possible depend on the type of variables

CREATE VARIABLE DIALOG



| Property | Description |
|---------------------------|--|
| Name | <p>Distinct name of the variable. If a variable with the same name already exists in the project, no additional variable can be created with this name.</p> <p>Maximum length: 128 characters</p> <p>Attention: the characters # and @ are not permitted in variable names. If non-permitted characters are used, creation of variables cannot be completed and the Finish button remains inactive.</p> <p>Note: Some drivers also allow addressing using the Symbolic address property.</p> |
| Driver | <p>Select the desired driver from the drop-down list.</p> <p>Note: If no driver has been opened in the project, the driver for internal variables (Intern.exe) is automatically loaded.</p> |
| Driver Object Type | Select the appropriate driver object type from the drop-down list. |
| Data Type | Select the desired data type. Click on the ... button to open the selection dialog. |
| Array settings | Expanded settings for array variables. You can find details in the |

| Property | Description |
|-------------------------------------|---|
| | Arrays chapter. |
| Addressing options | Expanded settings for arrays and structure variables. You can find details in the respective section. |
| Automatic element activation | Expanded settings for arrays and structure variables. You can find details in the respective section. |

SYMBOLIC ADDRESS

The **Symbolic address** property can be used for addressing as an alternative to the **Name** or **Identification** of the variables. Selection is made in the driver dialog; configuration is carried out in the variable property. When importing variables of supported drivers, the property is entered automatically.

Maximum length: 1024 characters.

The following drivers support the **Symbolic address**:

- ▶ 3S_V3
- ▶ AzureDrv
- ▶ BACnetNG
- ▶ IEC850
- ▶ KabaDPsServer
- ▶ OPCUA32
- ▶ Phoenix32
- ▶ POZYTON
- ▶ RemoteRT
- ▶ S7TIA
- ▶ SEL
- ▶ SnmpNg32
- ▶ PA_Drv
- ▶ EUROMAP63

INHERITANCE FROM DATA TYPE

Measuring range, **Signal range** and **Set value** are always:

- ▶ derived from the datatype
- ▶ Automatically adapted if the data type is changed

Note for signal range: If a change is made to a data type that does not support the set **signal range**, the **signal range** is amended automatically. For example, for a change from **INT** to **SINT**, the **signal range** is changed to 127. The amendment is also carried out if the **signal range** was not inherited from the data type. In this case, the **measuring range** must be adapted manually.

6.2 Addressing

Variable addressing is name-based.

The following limitations for variable names must be considered:

The following characters are not allowed in names: "(*", "*)", "//", "{" und }".

Not allowed at the start of variable names: "__" (=double underscore).

There are no further limitations for global variables of simple data types.

Structures and array variables must have IEC-compliant names. Exception: the structure/array names are put within curled brackets.

Example: {nonIECconform}.

The variable names must be put into curled brackets in the zenon Logic as well.

In zenon Logic, the limitation for local variables in the textbased programming languages ST(Structured Text) and IL(Instruction List) applies. Non IEC-compliant variables must be put into curled brackets as well.

| Group/Property | Description |
|----------------|--|
| General | Property group for general settings. |
| Name | <p>Name of the variable consists of connection name, zenon Logic area and variable name.</p> <p>Example <Connection name>/<zenon Logic area>/<variable name></p> <p><Connection name>: Name of connection</p> <p><zenon Logic area>: Name of the area: Global, Retain, IO name or name of the subprogram for local variables</p> <p><Variable name>: Name of the variable in the zenon Logic Runtime</p> <p>Examples: Project0/Global/Var1, Project0/Retain/Var2, Project0/%IX01/Var3, Project0/MyProg/</p> <p>Addressing is symbolic by means of name.</p> <p>The name fields are automatically set during online import.</p> |

| Group/Property | Description |
|---|---|
| Identification | <p>Can be used as an alternative for addressing variables if it is set in the Options (on page 16) of the driver configuration. The format for name and identification is identical.</p> <p>Addressing is symbolic by means of identification.</p> <p>The identification fields are automatically set during online import.</p> |
| Addressing | |
| Net address | not used for this driver |
| Data block | not used for this driver |
| Offset | Byte offset of an array element at the start of the array (is only necessary if the driver is used for connecting a zenon Logic application without CT segment). |
| Alignment | not used for this driver |
| Bit number | not used for this driver |
| String length | <p>Only available for String variables. Maximum number of characters that the variable can take.</p> <p>Note: If strings with a length of more than 245 characters are used, the <i>Max. write request length</i> (on page 17) must be set to 1024 instead of 512.</p> |
| Driver connection/Driver Object Type | Object type of the variables. Depending on the driver used, is selected when the variable is created and can be changed here. |
| Driver connection/Data Type | <p>Data type of the variable. Is selected when the variable is created and can be changed here.</p> <p>Attention: If you change the data type later, all other properties of the variable must be checked and adjusted, if necessary.</p> |
| Priority | <p>Allocation of the priority for updates to variables:</p> <ul style="list-style-type: none"> ▶ Increased: Polling with normal priority ▶ High: Polling with high priority ▶ Highest: Polling with highest priority |

| Group/Property | Description |
|------------------|--|
| | <p>► Normal: Spontaneous reading via events</p> <p>Default: <i>normal</i></p> <p>Attention: Spontaneous reading is only possible at active event connection (Driver configuration (on page 17)) and at a zenon Logic Runtime with Event server. Spontaneous reading of strings is not supported by all zenon Logic implementations. If spontaneous reading is not possible, the variable is polled.</p> |
| Symbolic address | Addressing is symbolic via symbolic address during; the symbolic address fields are automatically set during online import. |

ARRAYS

Arrays are allowed; you can create them in zenon Logic. Take care that in zenon option **Array Start index is 0** is set for the variable.

6.3 Driver objects and datatypes

Driver objects are areas available in the PLC, such as markers, data blocks etc. Here you can find out which driver objects are provided by the driver and which IEC data types can be assigned to the respective driver objects.

6.3.1 Driver objects

The following object types are available in this driver:

| Driver Object Type | Channel type | Read | Write | Supported data types | Description |
|------------------------------|--------------|------|-------|---|--|
| PLC marker | 8 | X | X | <i>BOOL, SINT, USINT, INT, UINT, DINT, UDINT, LINT, REAL, LREAL, STRING</i> | zenon Logic variable |
| <i>Communication details</i> | 35 | X | X | <i>BOOL, SINT, USINT, INT, UINT, DINT, UDINT, REAL, STRING</i> | Variables for the static analysis of the communication; Values are transferred between driver and Runtime (not |

| Driver Object Type | Channel type | Read | Write | Supported data types | Description |
|--------------------|--------------|------|-------|----------------------|--|
| | | | | | <p>to the PLC).</p> <p>Note: The addressing and the behavior is the same for most zenon drivers.</p> <p>You can find detailed information on this in the Communication details (Driver variables) (on page 37) chapter.</p> |

Key:

X: supported

--: not supported

CHANNEL TYPE

The term **Kanaltyp** is the internal numerical name of the driver object type. It is also used for the extended DBF import/export of the variables.

"**Kanaltyp**" is used for advanced CSV import/export of variables in the "**HWOBJECTType**" column.

6.3.2 Mapping of the data types

All variables in zenon are derived from IEC data types. The following table compares the IEC datatypes with the datatypes of the PLC.

| PLC | zenon | Data type |
|-------|-------|-----------|
| BOOL | BOOL | 8 |
| USINT | USINT | 9 |
| SINT | SINT | 10 |
| UINT | UINT | 2 |
| INT | INT | 1 |

| PLC | zenon | Data type |
|--------|-------------------|-----------|
| UDINT | UDINT | 4 |
| DINT | DINT | 3 |
| ULINT | ULINT | 27 |
| LINT | LINT | 26 |
| REAL | REAL | 5 |
| LREAL | LREAL | 6 |
| STRING | STRING | 12 |
| - | WSTRING | 21 |
| - | DATE | 18 |
| TIME | TIME | 17 |
| - | DATE_AND_TIME | 20 |
| - | TOD (Time of Day) | 19 |

DATA TYPE

The term **data type** is the internal numerical identification of the data type. It is also used for the extended DBF import/export of the variables.

⚠Attention

In contrast to zenon Logic, the complete value range of a LINT/ULINT is not available in zenon. Note this when configuring the project.

The limits of the value range in zenon are:

ULINT: 0 to 4.503.599.627.370.495

LINT: -2,251,799,813,685,248 to 2,251,799,813,685,247

⚠Attention

Variables of data type LINT/ULINT are only available to a limited extent under Windows CE, because there is not 64-bit integer in the Windows CE variant.

6.4 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.

6.4.1 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.

6.4.2 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 | Character | 128 | Variable name. 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 |
|----------------|------|------------|---|
| | | | <p>the new name entered under "VARIABLENNAME" (variable name) (field/column must be entered manually).</p> <p>The length can be limited using the MAX_LAENGE entry in the project.ini file.</p> |
| KANAL_D | Log | 1 | The variable is deleted with the 1 entry (field/column has to be created by hand). |
| TAGNR | C | 128 | <p>Identification.</p> <p>The length can be limited using the MAX_LAENGE entry in the project.ini file.</p> |
| 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 | <p>For bit variables: bit address</p> <p>For byte variables: 0=lower, 8=higher byte</p> <p>For string variables: Length of string (max. 63 characters)</p> |
| ARRAYSIZE | N | 16 | <p>Number of variables in the array for index variables</p> <p>ATTENTION: Only the first variable is fully available. All others are only available for VBA or the Recipegroup Manager</p> |
| LES_SCHR | L | 1 | <p>Write-Read-Authorization</p> <p>0: Not allowed to set value.</p> <p>1: Allowed to set value.</p> |
| 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-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 |
| MENTIEFE | 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. The length can be limited using the MAX_LAENGE entry in project.ini . |
| ADJWVBA | R | 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 | 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) (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 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 (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.

6.4.3 Online import

Via the online import, you can import the variables created in a zenon Logic application to a project:

1. select the driver in the zenon project tree
2. select **Import variables from driver...** from the context menu
3. follow the instructions of the import assistant

IMPORT OF "UNSIGNED DATATYPES"

During online import, "Unsigned Datatypes" is imported as "Signed Datatypes" by default.

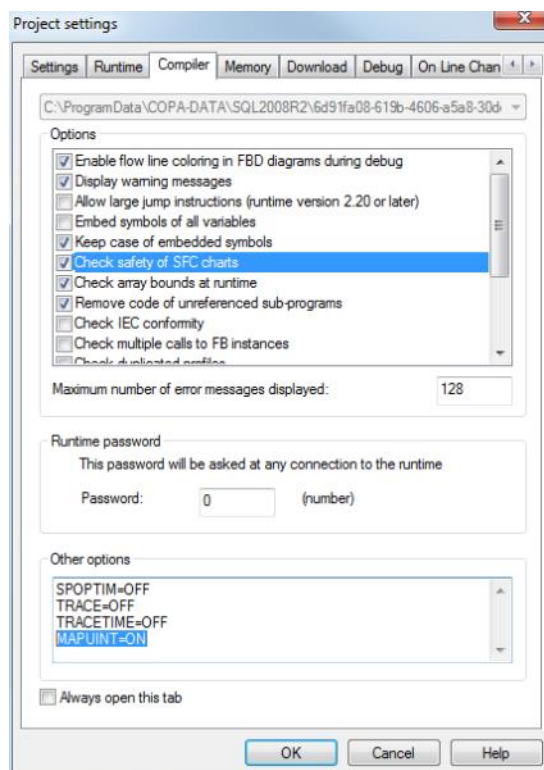
Attention

The import of "Unsigned Datatypes" as "Signed Datatypes" can have unwanted effects in the Runtime. For example: Large numbers in zenon Logic are converted to negative numbers in zenon etc.

To avoid unwanted effects, add the parameter *MAPUINT=ON* in the zenon Logic project for the compiler. To do this:

1. Open the zenon Logic project in the Workbench.
2. Click on **Communication parameters** in the **Tools** menu
3. Select the **Compiler** tab
4. Enter the following in the **Further options** field:

MAPUINT=ON



5. Unsigned Datatypes are then imported correctly

Attention

When importing retain variables from a zenon Logic project, these are named as ***/Global/*** instead of ***/Retain/***.

These retain variables must be manually renamed after the import.

6.5 Communication details (Driver variables)

The driver kit implements a number of driver variables. These variables are part of the driver object type *Communication details*. These are divided into:

- ▶ Information
- ▶ Configuration
- ▶ Statistics and
- ▶ Error message

The definitions of the variables implemented in the driver kit are available in the import file **DRVVAR.DBF** and can be imported from there.

Path to file: %ProgramData%\COPA-DATA\zenon<Versionsnummer>\PredefinedVariables

Note: Variable names must be unique in zenon. If driver variables of the driver object type *Communication details* are to be imported from **DRVVAR.DBF** again, the variables that were imported beforehand must be renamed.



Information

Not every driver supports all driver variables of the driver object type *Communication details*.

For example:

- ▶ Variables for modem information are only supported by modem-compatible drivers.
- ▶ Driver variables for the polling cycle are only available for pure polling drivers.
- ▶ Connection-related information such as **ErrorMSG** is only supported for drivers that only edit one connection at a time.

INFORMATION

| Name from import | Type | Offset | Description |
|-----------------------------|-------|--------|---------------------------------------|
| MainVersion | UINT | 0 | Main version number of the driver. |
| SubVersion | UINT | 1 | Sub version number of the driver. |
| BuildVersion | UINT | 29 | Build version number of the driver. |
| RTMajor | UINT | 49 | zenon main version number |
| RTMinor | UINT | 50 | zenon sub version number |
| RTSp | UINT | 51 | zenon Service Pack number |
| RTBuild | UINT | 52 | zenon build number |
| LineStateIdle | BOOL | 24.0 | TRUE, if the modem connection is idle |
| LineStateOffering | BOOL | 24.1 | TRUE, if a call is received |
| LineStateAccepted | BOOL | 24.2 | The call is accepted |
| LineStateDialtone | BOOL | 24.3 | Dialtone recognized |
| LineStateDialing | BOOL | 24.4 | Dialing active |
| LineStateRingBack | BOOL | 24.5 | While establishing the connection |
| LineStateBusy | BOOL | 24.6 | Target station is busy |
| LineStateSpecialInfo | BOOL | 24.7 | Special status information received |
| LineStateConnected | BOOL | 24.8 | Connection established |
| LineStateProceeding | BOOL | 24.9 | Dialing completed |
| LineStateOnHold | BOOL | 24.10 | Connection in hold |
| LineStateConferenced | BOOL | 24.11 | Connection in conference mode. |
| LineStateOnHoldPendConf | BOOL | 24.12 | Connection in hold for conference |
| LineStateOnHoldPendTransfer | BOOL | 24.13 | Connection in hold for transfer |
| LineStateDisconnected | BOOL | 24.14 | Connection terminated. |
| LineStateUnknow | BOOL | 24.15 | Connection status unknown |
| ModemStatus | UDINT | 24 | Current modem status |

| Name from import | Type | Offset | Description |
|------------------|--------|--------|--|
| TreiberStop | BOOL | 28 | Driver stopped For <i>driver stop</i> , the variable has the value <i>TRUE</i> and an OFF bit. After the driver has started, the variable has the value <i>FALSE</i> and no OFF bit. |
| SimulRTState | UDINT | 60 | Informs the state of Runtime for driver simulation. |
| ConnectionStates | STRING | 61 | Internal connection status of the driver to the PLC. Connection statuses: <ul style="list-style-type: none"> ▶ 0: Connection OK ▶ 1: Connection failure ▶ 2: Connection simulated Formating: <Net address>:<Connection status>;...;; A connection is only known after a variable has first signed in. In order for a connection to be contained in a string, a variable of this connection must be signed in once. The status of a connection is only updated if a variable of the connection is signed in. Otherwise there is no communication with the corresponding controller. |

CONFIGURATION

| Name from import | Type | Offset | Description |
|------------------|------|--------|---|
| ReconnectInRead | BOOL | 27 | If TRUE, the modem is automatically reconnected for reading |
| ApplyCom | BOOL | 36 | Apply changes in the settings of the serial interface. Writing to this variable immediately results in the method SrvDrvVarApplyCom being called (which currently has no further function). |

| Name from import | Type | Offset | Description |
|------------------|---------------|--------|---|
| ApplyModem | <i>BOOL</i> | 37 | Apply changes in the settings of the modem. Writing this variable immediately calls the method SrvDrvVarApplyModem. This closes the current connection and opens a new one according to the settings PhoneNumberSet and ModemHwAdrSet . |
| PhoneNumberSet | <i>STRING</i> | 38 | Telephone number, that should be used |
| ModemHwAdrSet | <i>DINT</i> | 39 | Hardware address for the telephone number |
| GlobalUpdate | <i>UDINT</i> | 3 | Update time in milliseconds (ms). |
| BGlobalUpdaten | <i>BOOL</i> | 4 | TRUE, if update time is global |
| TreiberSimul | <i>BOOL</i> | 5 | TRUE, if driver in sin simulation mode |
| TreiberProzab | <i>BOOL</i> | 6 | TRUE, if the variables update list should be kept in the memory |
| ModemActive | <i>BOOL</i> | 7 | TRUE, if the modem is active for the driver |
| Device | <i>STRING</i> | 8 | Name of the serial interface or name of the modem |
| ComPort | <i>UINT</i> | 9 | Number of the serial interface. |
| Baudrate | <i>UDINT</i> | 10 | Baud rate of the serial interface. |
| Parity | <i>SINT</i> | 11 | Parity of the serial interface |
| ByteSize | <i>USINT</i> | 14 | Number of bits per character of the serial interface Value = 0 if the driver cannot establish any serial connection. |
| StopBit | <i>USINT</i> | 13 | Number of stop bits of the serial interface. |
| Autoconnect | <i>BOOL</i> | 16 | TRUE, if the modem connection should be established automatically for reading/writing |
| PhoneNumber | <i>STRING</i> | 17 | Current telephone number |
| ModemHwAdr | <i>DINT</i> | 21 | Hardware address of current telephone number |

| Name from import | Type | Offset | Description |
|------------------|-------|--------|--|
| RxIdleTime | UINT | 18 | Modem is disconnected, if no data transfer occurs for this time in seconds (s) |
| WriteTimeout | UDINT | 19 | Maximum write duration for a modem connection in milliseconds (ms). |
| RingCountSet | UDINT | 20 | Number of ringing tones before a call is accepted |
| ReCallIdleTime | UINT | 53 | Waiting time between calls in seconds (s). |
| ConnectTimeout | UINT | 54 | Time in seconds (s) to establish a connection. |

STATISTICS

| Name from import | Type | Offset | Description |
|---------------------|-------|--------|--|
| MaxWriteTime | UDINT | 31 | The longest time in milliseconds (ms) that is required for writing. |
| MinWriteTime | UDINT | 32 | The shortest time in milliseconds (ms) that is required for writing. |
| MaxBlkReadTime | UDINT | 40 | Longest time in milliseconds (ms) that is required to read a data block. |
| MinBlkReadTime | UDINT | 41 | Shortest time in milliseconds (ms) that is required to read a data block. |
| WriteErrorCount | UDINT | 33 | Number of writing errors |
| ReadSucceedCount | UDINT | 35 | Number of successful reading attempts |
| MaxCycleTime | UDINT | 22 | Longest time in milliseconds (ms) required to read all requested data. |
| MinCycleTime | UDINT | 23 | Shortest time in milliseconds (ms) required to read all requested data. |
| WriteCount | UDINT | 26 | Number of writing attempts |
| ReadErrorCount | UDINT | 34 | Number of reading errors |
| MaxUpdateTimeNormal | UDINT | 56 | Time since the last update of the priority group Normal in milliseconds (ms). |
| MaxUpdateTimeHigh | UDINT | 57 | Time since the last update of the priority group |

| Name from import | Type | Offset | Description |
|----------------------|--------------|--------|---|
| er | | | Higher in milliseconds (ms). |
| MaxUpdateTimeHigh | <i>UDINT</i> | 58 | Time since the last update of the priority group High in milliseconds (ms). |
| MaxUpdateTimeHighest | <i>UDINT</i> | 59 | Time since the last update of the priority group Highest in milliseconds (ms). |
| PokeFinish | <i>BOOL</i> | 55 | Goes to 1 for a query, if all current pokes were executed |

ERROR MESSAGE

| Name from import | Type | Offset | Description |
|-------------------|---------------|--------|---|
| ErrorTimeDW | <i>UDINT</i> | 2 | Time (in seconds since 1.1.1970), when the last error occurred. |
| ErrorTimeS | <i>STRING</i> | 2 | Time (in seconds since 1.1.1970), when the last error occurred. |
| RdErrPrimObj | <i>UDINT</i> | 42 | Number of the PrimObject, when the last reading error occurred. |
| RdErrStationsName | <i>STRING</i> | 43 | Name of the station, when the last reading error occurred. |
| RdErrBlockCount | <i>UINT</i> | 44 | Number of blocks to read when the last reading error occurred. |
| RdErrHwAdresse | <i>DINT</i> | 45 | Hardware address when the last reading error occurred. |
| RdErrDatablockNo | <i>UDINT</i> | 46 | Block number when the last reading error occurred. |
| RdErrMarkerNo | <i>UDINT</i> | 47 | Marker number when the last reading error occurred. |
| RdErrSize | <i>UDINT</i> | 48 | Block size when the last reading error occurred. |
| DrvError | <i>USINT</i> | 25 | Error message as number |
| DrvErrorMsg | <i>STRING</i> | 30 | Error message as text |
| ErrorFile | <i>STRING</i> | 15 | Name of error log file |

7 Driver-specific functions

The driver supports the following functions:

RDA FUNCTIONALITY

The zenon Logic driver supports the RDA functionality. The RDA archiving requires a linear memory area in the PLC, which is realized with an array in zenon Logic. This array must contain the appropriate RDA header + archive data. In the zenon Logic, only the Index [0] of this array may be activated and marked as an RDA variable. If the array Index [0] is set to 1, the corresponding values are read out from zenon Logic.

More information about the RDA archiving can be found in the online help of zenon Logic in the chapter Archiving.

BLOCKWRITE

Variables can be written in blocks without changing the write sequence of the variables. Block write is therefore always active and can be explicitly turned on or off.

LIMITATIONS

MAXIMUM VALUE CHANGES PER TRANSFER CYCLE

A maximum of 255 events can be transferred per cycle.

ARRAYS

Arrays are allowed; you can create them in zenon Logic. Note the different handling of indices, depending on the array start of the zenon variables. This option must be selected in the dialog when a variable is created in zenon Logic.

Elements can be changed with **Array Start 0**:

| | Index, e. g.: | Allocation | | | | | |
|-------------|---------------|------------|---|---|---|-----|----|
| zenon | [1...10] | 1 | 2 | 3 | 4 | ... | 10 |
| zenon Logic | [0...9] | 0 | 1 | 2 | 3 | ... | 9 |

For the correct assignment of the elements, the following should be the case:

1. The **array start** in zenon should be set to 0
2. in zenon Logic, the **Store complex variables in separate segment** must be active

Description:

If the **Store complex variables in separate segment** in zenon Logic is

- ▶ active, then the variables are assigned in the driver using the variable names only. This means:
 - ▶ The variables must have the same name.
 - ▶ Arrays must start with 0 in zenon, otherwise the elements are switched.
- ▶ not active, then zenon array variables with start index 1 can be communicated correctly. Because:
 - ▶ The name of the basic variable is used for array variables.
 - ▶ The zenon offset setting is used for the index.

Attention: That does not work for array structures however, because only one index per variable can be saved in the offset.

This means: There are no restrictions if the **array start** in zenon is set to 0

Attention

If the **Store complex variables in separate segment** option is switched off, no arrays of structures or arrays in structures are supported. The index of an array element is then read from the offset setting of the variable.

To do this, the following settings must have been set up:

- ▶ The offset must be calculated automatically
- ▶ Each datatype starts at a new offset (datatypes are not packed)

STRUCTURES

Structures are allowed. We recommend to create structure data types only in zenon Logic, even if they are only used locally in the PLC.

VERSIONS

For the sake of performance, the zenon Logic Runtime Version 6.22 SP0 Build 2 needs the zenon Logic driver for the same or earlier zenon versions. Earlier zenon Logic Runtime versions still work with all zenon Logic drivers.

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

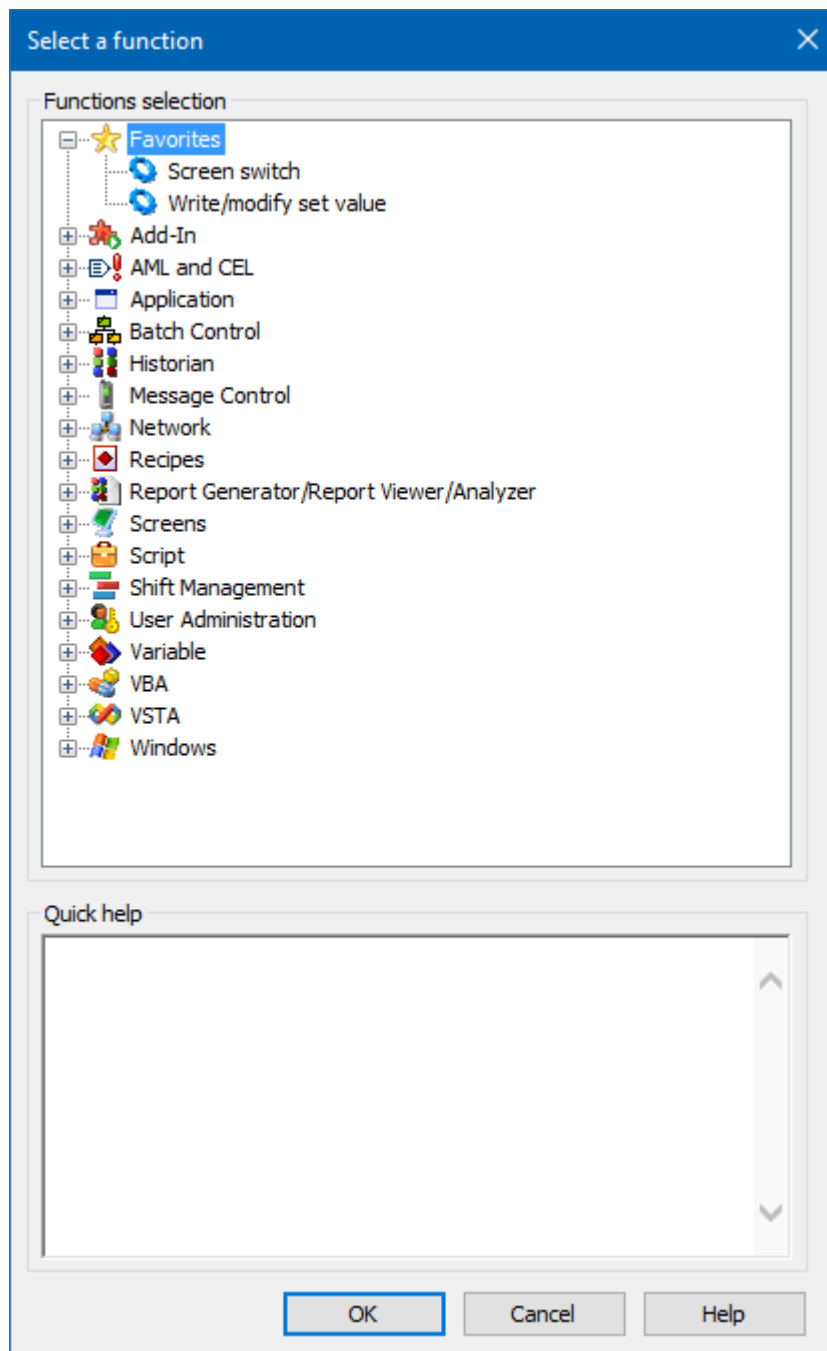
The zenon **Driver commands** function is not identical to driver commands that can be executed in the Runtime with Energy drivers!

CONFIGURATION OF THE FUNCTION

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

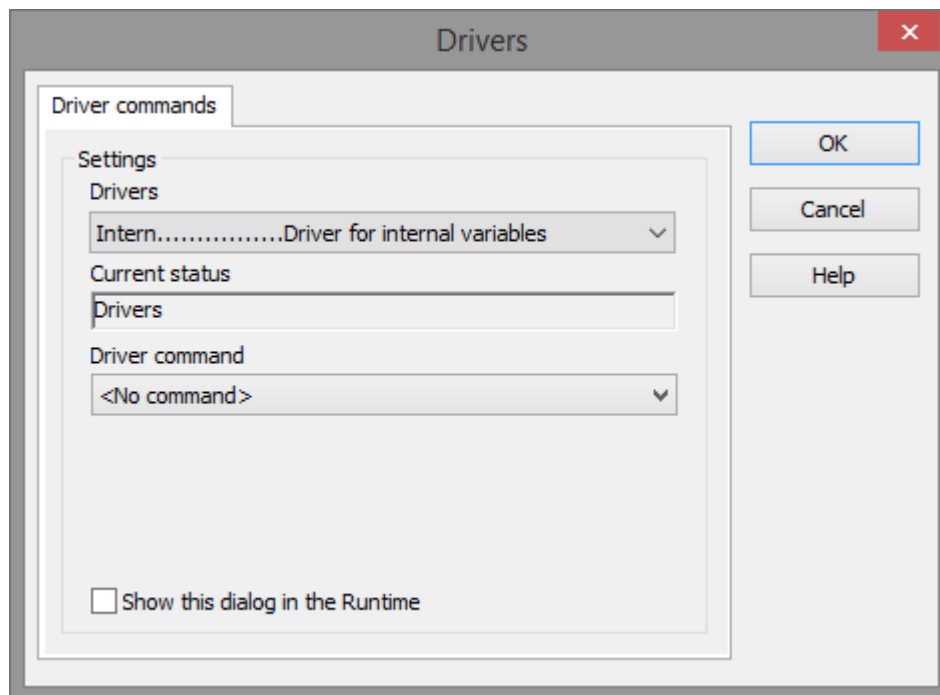
1. Create a new function in the zenon Editor.

The dialog for selecting a function is opened



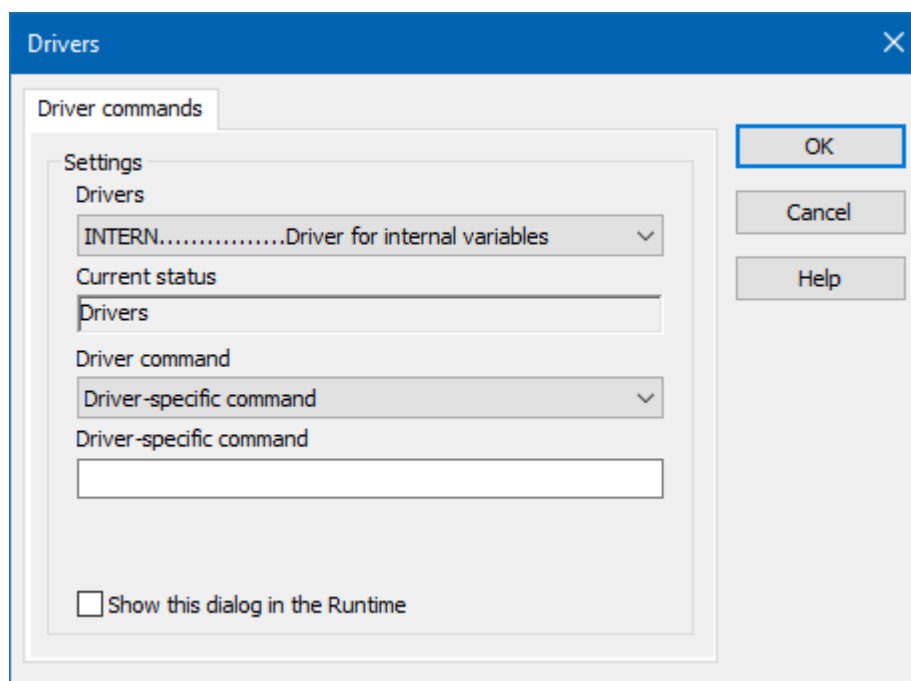
2. Navigate to the node **Variable**.
3. Select the **Driver commands** entry.

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. It contains all drivers loaded in the project. |
| Current condition | Fixed entry that is set by the system. no function in the current version. |
| Driver command | no function in the current version. 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. Note: Only available if, for the driver command option, the <i>driver-specific command</i> has been selected. |
| Show this dialog in the Runtime | Configuration of whether the configuration can be changed in the Runtime: <ul style="list-style-type: none"> ▶ <i>Active</i>: This dialog is opened in the Runtime before executing the function. The configuration can thus still be changed in the Runtime before execution. ▶ <i>Inactive</i>: The Editor configuration is applied in the Runtime when executing the function. Default: <i>inactive</i> |

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 |
|-------------------|--|
| <i>No command</i> | No command is sent. A command that already exists can thus be removed from a configured function. |

| Driver command | Description |
|---|---|
| <i>Start driver (online mode)</i> | Driver is reinitialized and started. Note: If the driver has already been started, it must be stopped. Only then can the driver be re-initialized and started. |
| <i>Stop driver (offline mode)</i> | 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 <i>switched off</i> (OFF; Bit 20). |
| <i>Driver in simulation mode</i> | 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. |
| <i>Driver in hardware mode</i> | 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. |
| <i>Driver-specific command</i> | Entry of a driver-specific command. Opens input field in order to enter a command. |
| <i>Driver - activate set setpoint value</i> | Write set value to a driver is possible. |
| <i>Driver - deactivate set setpoint value</i> | Write set value to a driver is prohibited. |
| <i>Establish connection with modem</i> | Establish connection (for modem drivers) Opens the input fields for the hardware address and for the telephone number. |
| <i>Disconnect from modem</i> | Terminate connection (for modem drivers) |
| <i>Driver in counting simulation mode</i> | Driver is set into counting simulation mode. 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. |
| <i>Driver in static simulation mode</i> | No communication to the controller is established. All values are initialized with 0. |
| <i>Driver in programmed simulation mode</i> | 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 |
|--|--|
| <i>Communication with driver:<drvExe>/<drvDesc>(id:<drvId>) timed out. No communication for <time> ms.</i> | No communication with driver within the given time. <ul style="list-style-type: none"> ▶ <time>: Time (in milliseconds) ▶ <drvDesc>: Driver name ▶ <drvExe>: Driver EXE name ▶ <drvId>: Driver ID in the zenon project |
| <i>Communication with %s timed out. Invalid-Bit will be set.</i> | Communication to the %s driver could not be established after 5 attempts within 60 seconds. The INVALID bit is set for the variable. |
| <i>Communication with %s timed out. Timeout happened %d times</i> | Communication to the %s driver could not be established after %d times within 60 seconds. |

9.3 Check list

Check the following in the event of errors:

- ▶ Does the driver have the right communication parameters? (IP Address, Port)
- ▶ Does the target system support spontaneous data traffic? (Maybe deactivate Flag „Use event mode“)
- ▶ Was the log file analyzed with the help of the Diagnosis Viewer (on page 50)? Which errors occurred?

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. You can find more information on the Diagnosis Viewer in the Diagnosis Viewer manual.

The following is required for further analysis of errors:

- ▶ The project backup
- ▶ LOG files

Send these to your support person after agreement with the customer service department.