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<th>Description</th>
<th>Page</th>
</tr>
</thead>
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</tr>
<tr>
<td>10.3</td>
<td>Check list</td>
<td>48</td>
</tr>
</tbody>
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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. Trend32

Note: The settings for the option Update Time Global in the configuration General (on page 11) are ignored by this driver. The time is set to 100ms and fixed.
### 3. TREND32 - Data sheet

<table>
<thead>
<tr>
<th><strong>General:</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver file name</td>
<td>TREND32.exe</td>
</tr>
<tr>
<td>Driver name</td>
<td>Trend Driver</td>
</tr>
<tr>
<td>PLC types</td>
<td>IQ xxx</td>
</tr>
<tr>
<td>PLC manufacturer</td>
<td>Trend;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Driver supports:</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Protocol</td>
<td>Trend Attribut Comunication;</td>
</tr>
<tr>
<td>Addressing: Address-based</td>
<td>X</td>
</tr>
<tr>
<td>Addressing: Name-based</td>
<td>--</td>
</tr>
<tr>
<td>Spontaneous communication</td>
<td>--</td>
</tr>
<tr>
<td>Polling communication</td>
<td>X</td>
</tr>
<tr>
<td>Online browsing</td>
<td>X</td>
</tr>
<tr>
<td>Offline browsing</td>
<td>--</td>
</tr>
<tr>
<td>Real-time capable</td>
<td>--</td>
</tr>
<tr>
<td>Blockwrite</td>
<td>--</td>
</tr>
<tr>
<td>Modem capable</td>
<td>X</td>
</tr>
<tr>
<td>Serial logging</td>
<td>X</td>
</tr>
<tr>
<td>RDA numerical</td>
<td>X</td>
</tr>
<tr>
<td>RDA String</td>
<td>--</td>
</tr>
</tbody>
</table>
## Requirements:

<table>
<thead>
<tr>
<th>Hardware PC</th>
<th>RS 232 serial interface; EJ101442 cable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software PC</td>
<td>--</td>
</tr>
<tr>
<td>Hardware PLC</td>
<td>--</td>
</tr>
<tr>
<td>Software PLC</td>
<td>--</td>
</tr>
<tr>
<td>Requires v-dll</td>
<td>--</td>
</tr>
</tbody>
</table>

## Platforms:

<table>
<thead>
<tr>
<th>Operating systems</th>
<th>Windows 7, 8, 8.1, 10, Server 2008R2, Server 2012, Server 2012R2;</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE platforms</td>
<td>;</td>
</tr>
</tbody>
</table>

## 4. Driver history

<table>
<thead>
<tr>
<th>Date</th>
<th>Driver version</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>07.07.08</td>
<td>1600</td>
<td>Created driver documentation</td>
</tr>
</tbody>
</table>

### 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 form the next consecutive build number.
5. Requirements

This chapter contains information on the requirements that are necessary for use of this driver.

5.1 PC

HARDWARE

Serial interface RS232
Cable: EJ101442
Protocol: Trend Attribute communication

SOFTWARE

Copy the driver file Trend32.EXE to the current zenon directory (unless it is already there).

CONNECTION

Direct connection Trend-PC with additional EJ 101442 cable. Configurable data transfer rate.
5.2 Control

HARDWARE

IQxxx

SOFTWARE

For Alarms: Text communication On

6. 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.

6.1 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.

---

### 6.2 Settings in the driver dialog

You can change the following settings of the driver:

#### 6.2.1 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.
<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode</td>
<td>Allows to switch between hardware mode and simulation mode</td>
</tr>
<tr>
<td></td>
<td>‣ Hardware:&lt;br&gt;  A connection to the control is established.</td>
</tr>
<tr>
<td></td>
<td>‣ Simulation static:&lt;br&gt;  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.</td>
</tr>
<tr>
<td></td>
<td>‣ Simulation - counting:&lt;br&gt;  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.</td>
</tr>
<tr>
<td></td>
<td>‣ Simulation - programmed:&lt;br&gt;  No communication is established to the PLC. 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 a zenon Logic Runtime which is integrated in the driver. For details see chapter Driver simulation (main.chm::/25206.htm).</td>
</tr>
<tr>
<td>Keep update list in the memory</td>
<td>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.</td>
</tr>
<tr>
<td>Output can be written</td>
<td><strong>Active:</strong> Outputs can be written. <strong>Inactive:</strong> Writing of outputs is prevented. <strong>Note:</strong> Not available for every driver.</td>
</tr>
<tr>
<td>Variable image remanent</td>
<td>This option saves and restores the current value, time stamp and the states of a data point. Fundamental requirement: The variable must have a valid value and time stamp.</td>
</tr>
</tbody>
</table>
The variable image is saved in mode hardware if:
- one of the states S_MERKER_1(0) up to S_MERKER8(7), REVISION(9), AUS(20) or ERSATZWERT(27) is active

The variable image is always saved if:
- the variable is of the object type **Driver variable**
- the driver runs in simulation mode. (not programmed simulation)

The following states are not restored at the start of the Runtime:
- SELECT(8)
- WR-ACK(40)
- WR-SUC(41)

The mode **Simulation - programmed** at the driver start is not a criterion in order to restore the remanent variable image.

### Stop on Standby Server

Setting for redundancy at drivers which allow only on communication connection. For this the driver is stopped at the Standby Server and only started at the upgrade.

**Attention:** If this option is active, the gapless archiving is no longer guaranteed.

**Active:** 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** ([statusverarbeitung.chm::/24150.htm](statusverarbeitung.chm::/24150.htm)) but an empty value. This prevents that at the upgrade to the Server irrelevant values are created in the AML, CEL and Historian.

**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.

### Global Update time

**Active:** The set **Global update time** in ms is used for all variables in the project. The priority set at the variables is not used.

**Inactive:** The set priorities are used for the individual variables.

### Priority

The polling times for the individual priority classes are set here. All variables with the according priority are polled in the set time.

The allocation to the variables takes place separately in the settings of the variable properties.

The communication of the individual variables are graduated in respect of importance or necessary topicality using the priorities.
Thus the communication load is distributed better.

Attention: Priority classes are not supported by each driver. For example, drivers that communicate spontaneously do not support it.

### CLOSE DIALOG

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OK</strong></td>
<td>Applies all changes in all tabs and closes the dialog.</td>
</tr>
<tr>
<td><strong>Cancel</strong></td>
<td>Discards all changes in all tabs and closes the dialog.</td>
</tr>
<tr>
<td><strong>Help</strong></td>
<td>Opens online help.</td>
</tr>
</tbody>
</table>

### UPDATE TIME FOR CYCLICAL DRIVERS

The following applies for cyclical drivers:

For **Set value, Advising** of variables and **Requests**, a read cycle is immediately triggered for all drivers - regardless of the set update time. This ensures that the value is immediately available for visualization after writing. Update times can therefore be shorter than pre-set for cyclical drivers.

6.2.2 **Com**
<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modem connection</td>
<td>Shows the fields for the modem settings (see below).</td>
</tr>
<tr>
<td></td>
<td>Version 5.2 and higher</td>
</tr>
<tr>
<td>Com</td>
<td>Select serial interface</td>
</tr>
<tr>
<td></td>
<td>COM1 – COM16</td>
</tr>
<tr>
<td>Data bit</td>
<td>Data word length</td>
</tr>
<tr>
<td></td>
<td>5; 6; 7; 8</td>
</tr>
<tr>
<td></td>
<td>If this field exists, the done settings are irrelevant.</td>
</tr>
<tr>
<td>Stop bit</td>
<td>1; 1.5; 2</td>
</tr>
<tr>
<td>Baud rate</td>
<td>Data transfer rate</td>
</tr>
<tr>
<td></td>
<td>110; 300; 1200; 2400; 4800; 9600; 19200; 38400; 57600; 115200</td>
</tr>
<tr>
<td>Parity</td>
<td>None; odd; even</td>
</tr>
<tr>
<td></td>
<td>If this field exists, the done settings are irrelevant.</td>
</tr>
<tr>
<td>Protocol</td>
<td>No Xon/Xoff, Hardware</td>
</tr>
<tr>
<td></td>
<td>If this field exists, the done settings are irrelevant.</td>
</tr>
</tbody>
</table>

**DEFAULT CONFIGURATION**

Baud rate: 9600  
Data bit: 7 assigned by protocol  
Stop bit: 1 assigned by protocol  
Parity: odd given by the protocol  
Protocol: none assigned by protocol
6.2.3 Driver dialog basic setting

Connections can be configured in the driver configuration dialog. A unique number has to be assigned to each connection.

6.2.4 Driver dialog addressing

Connections can be configured in the driver configuration dialog. A unique number has to be assigned to each connection.

This number has to be entered under "Net address" when the variables are created.

It is possible to enter a pin-number, if a pin number is required to write to the variable.
It is possible to create a new entry or to edit or delete an existing one with the "New", "Delete" and "Edit" buttons.

The done settings are saved in a file. The name of this file can be defined.

7. Creating variables

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

7.1 Creating variables in the Editor

Variables can be created:

- as simple variables
- in arrays (main.chm::/15262.htm)
- as structure variables (main.chm::/15278.htm)

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

2. The dialog for configuring variables is opened

3. Configure the variable
4. The settings that are possible depends on the type of variables
Creating variables

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>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. Maximum length: 128 character.</td>
</tr>
<tr>
<td></td>
<td><strong>Attention:</strong> 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. Note: For some drivers, the addressing is possible over the property Symbolic address, as well.</td>
</tr>
<tr>
<td>Drivers</td>
<td>Select the desired driver from the drop-down list.</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> If no driver has been opened in the project, the driver for internal variables (Intern.exe (Main.chm::/Intern.chm::/Intern.htm)) is automatically loaded.</td>
</tr>
<tr>
<td>Driver object type</td>
<td>Select the appropriate driver object type from the drop-down list.</td>
</tr>
<tr>
<td>(cti.chm::/28685.htm)</td>
<td></td>
</tr>
<tr>
<td>Data type</td>
<td>Select the desired data type. Click on the ... button to open the selection dialog.</td>
</tr>
<tr>
<td>Array settings</td>
<td>Expanded settings for array variables. You can find details in the Arrays chapter.</td>
</tr>
<tr>
<td>Addressing options</td>
<td>Expanded settings for arrays and structure variables. You can find details in the respective section.</td>
</tr>
<tr>
<td>Automatic element activation</td>
<td>Expanded settings for arrays and structure variables. You can find details in the respective section.</td>
</tr>
</tbody>
</table>

**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.

**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.
### 7.2 Addressing

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name</strong></td>
<td>Freely definable name</td>
</tr>
<tr>
<td></td>
<td><strong>Attention:</strong> the name must be unique within each control system project.</td>
</tr>
<tr>
<td><strong>Identification</strong></td>
<td>Any text can be entered here, e.g. for resource labels, comments ...</td>
</tr>
<tr>
<td><strong>Net address</strong></td>
<td>Bus address or net address of the variable.</td>
</tr>
<tr>
<td></td>
<td>This address refers to the bus address in the connection configuration of the driver. This defines the PLC, on which the variable resides.</td>
</tr>
<tr>
<td><strong>Data block</strong></td>
<td>For variables of object type Extended data block, enter the datablock number here. Configurable [0.. 4294967295]. Please look up the exact maximum range for data blocks in the manual of the PLC.</td>
</tr>
<tr>
<td><strong>Offset</strong></td>
<td>Offset of the variable; the memory address of the variable in the PLC. Configurable [0.. 4294967295].</td>
</tr>
<tr>
<td><strong>Alignment</strong></td>
<td>not used for this driver</td>
</tr>
<tr>
<td><strong>Bit number</strong></td>
<td>Number of the bit within the configured offset.</td>
</tr>
<tr>
<td></td>
<td>Allowed entry [0.. 65535], Working range [0..7]</td>
</tr>
<tr>
<td><strong>String length</strong></td>
<td>Only available for String variables: Maximum number of characters that the variable can take.</td>
</tr>
<tr>
<td><strong>Driver connection/Driver Object Type</strong></td>
<td>Depending on the employed driver, an object type is selected during the creation of the variable; the type can be changed here later.</td>
</tr>
<tr>
<td><strong>Driver connection/Data Type</strong></td>
<td>Data type of the variable, which is selected during the creation of the variable; the type can be changed here later.</td>
</tr>
<tr>
<td></td>
<td><strong>Attention:</strong> If you change the data type later, all other properties of the variable must be checked and adjusted, if necessary.</td>
</tr>
<tr>
<td><strong>Driver connection/Priority</strong></td>
<td>Setting the priority class. The variable of the priority class is thus assigned as it was configured in the driver dialog in the <strong>General</strong> tab. The priority classes are only used if the <strong>global update time</strong> is deactivated.</td>
</tr>
<tr>
<td></td>
<td>If the <strong>global update time</strong> option is activated and the priority classes are used, there is an error entry in the log file of the system. The driver uses the highest possible priority.</td>
</tr>
</tbody>
</table>
7.3  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.

7.3.1  Driver objects

The following object types are available in this driver:
## Creating variables

<table>
<thead>
<tr>
<th>Driver object type</th>
<th>Channel type</th>
<th>Read</th>
<th>Write</th>
<th>Supported data types</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm variable</td>
<td>9</td>
<td>X</td>
<td>X</td>
<td>UINT</td>
<td></td>
</tr>
<tr>
<td>Analog output</td>
<td>67</td>
<td>X</td>
<td>X</td>
<td>REAL</td>
<td></td>
</tr>
<tr>
<td>analog joint</td>
<td>66</td>
<td>X</td>
<td>X</td>
<td>REAL</td>
<td></td>
</tr>
<tr>
<td>Bit</td>
<td>71</td>
<td>X</td>
<td>X</td>
<td>BOOL</td>
<td></td>
</tr>
<tr>
<td>Digital output</td>
<td>69</td>
<td>X</td>
<td>X</td>
<td>BOOL</td>
<td></td>
</tr>
<tr>
<td>Digital input</td>
<td>68</td>
<td>X</td>
<td>X</td>
<td>BOOL</td>
<td></td>
</tr>
<tr>
<td>Knob</td>
<td>65</td>
<td>X</td>
<td>X</td>
<td>REAL</td>
<td></td>
</tr>
<tr>
<td>Multivariable Bit</td>
<td>8</td>
<td>X</td>
<td>X</td>
<td>REAL, BOOL</td>
<td></td>
</tr>
<tr>
<td>Multivariable Float</td>
<td>8</td>
<td>X</td>
<td>X</td>
<td>REAL, BOOL</td>
<td></td>
</tr>
<tr>
<td>Multivariable String</td>
<td>72</td>
<td>X</td>
<td>X</td>
<td>STRING</td>
<td></td>
</tr>
<tr>
<td>Switch</td>
<td>70</td>
<td>X</td>
<td>X</td>
<td>BOOL</td>
<td></td>
</tr>
<tr>
<td>Sensor</td>
<td>64</td>
<td>X</td>
<td>X</td>
<td>REAL</td>
<td></td>
</tr>
<tr>
<td>Trigger variable</td>
<td>21</td>
<td>X</td>
<td>X</td>
<td>BOOL</td>
<td></td>
</tr>
<tr>
<td>Driver variable</td>
<td>35</td>
<td>X</td>
<td>X</td>
<td>BOOL, SINT, USINT, INT, UINT, DINT, UDINT, REAL, STRING</td>
<td>Variables for the statistical analysis of communication. Find out more in the chapter about the Driver variables (on page 32)</td>
</tr>
</tbody>
</table>

### Objects for variables in zenon

<table>
<thead>
<tr>
<th>Object</th>
<th>Read</th>
<th>Write</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Sensor</td>
<td>X</td>
<td>X</td>
<td>V-Parameter is read/written.</td>
</tr>
<tr>
<td>Knob</td>
<td>X</td>
<td>X</td>
<td>V-Parameter is read/written.</td>
</tr>
<tr>
<td>analog joint</td>
<td>X</td>
<td>X</td>
<td>V-Parameter is read/written.</td>
</tr>
<tr>
<td>Analog output</td>
<td>X</td>
<td>X</td>
<td>V-Parameter is read/written.</td>
</tr>
<tr>
<td>Digital input</td>
<td>X</td>
<td>X</td>
<td>S-Parameter is read/written.</td>
</tr>
<tr>
<td>Digital output</td>
<td>X</td>
<td>X</td>
<td>V-Parameter is read/written.</td>
</tr>
<tr>
<td>Switch</td>
<td>X</td>
<td>X</td>
<td>S-Parameter is read/written.</td>
</tr>
<tr>
<td>Bit</td>
<td>X</td>
<td>X</td>
<td>Sx-parameter is read/written.(x=Bitnr.)</td>
</tr>
<tr>
<td>Multivariable Type Float</td>
<td>X</td>
<td>X</td>
<td>Parameter defined in name is read/written.</td>
</tr>
<tr>
<td>Multivariable Type Bit</td>
<td>X</td>
<td>X</td>
<td>Parameter defined in name is read/written.</td>
</tr>
</tbody>
</table>
7.3.2 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.

<table>
<thead>
<tr>
<th>PLC</th>
<th>zenon</th>
<th>Data type</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOOL</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>USINT</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>SINT</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>UINT</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>INT</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>UDINT</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>DINT</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>UINT</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>LINT</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>REAL</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>LREAL</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>STRING</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>WSTRING</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>DATE</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>TIME</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>DATE_AND_TIME</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>TOD (Time of Day)</td>
<td>19</td>
<td></td>
</tr>
</tbody>
</table>

Data type: The property Data type is the internal numerical name of the data type. It is also used for the extended DBF import/export of the variables.
7.4 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 (main.chm::/13028.htm) manual in the Variables (main.chm::/13045.htm) section.

7.4.1 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.

7.4.2 DBF Import/Export

Data can be exported to and imported from dBase.
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.

**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

**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.
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**

<table>
<thead>
<tr>
<th>Identification</th>
<th>Type</th>
<th>Field size</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>KANALNAME</td>
<td>Char</td>
<td>128</td>
<td>Variable name. The length can be limited using the MAX_LAENGE entry in project.ini.</td>
</tr>
<tr>
<td>KANAL_R</td>
<td>C</td>
<td>128</td>
<td>The original name of a variable that is to be replaced by the new name entered under &quot;VARIABLENAME&quot; (field/column must be entered manually). The length can be limited using the MAX_LAENGE entry in project.ini.</td>
</tr>
<tr>
<td>KANAL_D</td>
<td>Log</td>
<td>1</td>
<td>The variable is deleted with the 1 entry (field/column has to be created by hand).</td>
</tr>
<tr>
<td>TAGNR</td>
<td>C</td>
<td>128</td>
<td>Identification. The length can be limited using the MAX_LAENGE entry in project.ini.</td>
</tr>
<tr>
<td>EINHEIT</td>
<td>C</td>
<td>11</td>
<td>Technical unit</td>
</tr>
<tr>
<td>DATENART</td>
<td>C</td>
<td>3</td>
<td>Data type (e.g. bit, byte, word, ...) corresponds to the data type.</td>
</tr>
<tr>
<td>KANALTYP</td>
<td>C</td>
<td>3</td>
<td>Memory area in the PLC (e.g. marker area, data area, ...) corresponds to the driver object type.</td>
</tr>
<tr>
<td>HWKANAL</td>
<td>Num</td>
<td>3</td>
<td>Bus address</td>
</tr>
<tr>
<td>BAUSTEIN</td>
<td>N</td>
<td>3</td>
<td>Datablock address (only for variables from the data area of the PLC)</td>
</tr>
<tr>
<td>ADRESSE</td>
<td>N</td>
<td>5</td>
<td>Offset</td>
</tr>
<tr>
<td>BITADR</td>
<td>N</td>
<td>2</td>
<td>For bit variables: bit address. For byte variables: 0=lower, 8=higher byte For string variables: Length of string (max. 63 characters)</td>
</tr>
<tr>
<td>ARRAYSIZE</td>
<td>N</td>
<td>16</td>
<td>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</td>
</tr>
<tr>
<td>Variable</td>
<td>Type</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>--------</td>
<td>-----------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>LES_SCHR</td>
<td>L 1</td>
<td>Write-Read-Authorization 0: Not allowed to set value. 1: Allowed to set value.</td>
<td></td>
</tr>
<tr>
<td>MIT_ZEIT</td>
<td>L 1</td>
<td>Time stamp in zenon (only if supported by the driver)</td>
<td></td>
</tr>
<tr>
<td>OBJEKT</td>
<td>N 2</td>
<td>Driver-specific ID number of the primitive object comprises TREIBER-OBJEKTYP and DATENTYP</td>
<td></td>
</tr>
<tr>
<td>SIGMIN</td>
<td>Float 16</td>
<td>Non-linearized signal - minimum (signal resolution)</td>
<td></td>
</tr>
<tr>
<td>SIGMAX</td>
<td>F 16</td>
<td>Non-linearized signal - maximum (signal resolution)</td>
<td></td>
</tr>
<tr>
<td>ANZMIN</td>
<td>F 16</td>
<td>Technical value - minimum (measuring range)</td>
<td></td>
</tr>
<tr>
<td>ANZMAX</td>
<td>F 16</td>
<td>Technical value - maximum (measuring range)</td>
<td></td>
</tr>
<tr>
<td>ANZKOMMA</td>
<td>N 1</td>
<td>Number of decimal places for the display of the values (measuring range)</td>
<td></td>
</tr>
<tr>
<td>UPDATERATE</td>
<td>F 19</td>
<td>Update rate for mathematics variables (in sec, one decimal possible) not used for all other variables</td>
<td></td>
</tr>
<tr>
<td>MEMTIEFE</td>
<td>N 7</td>
<td>Only for compatibility reasons</td>
<td></td>
</tr>
<tr>
<td>HDRATE</td>
<td>F 19</td>
<td>HD update rate for historical values (in sec, one decimal possible)</td>
<td></td>
</tr>
<tr>
<td>HDTIEFE</td>
<td>N 7</td>
<td>HD entry depth for historical values (number)</td>
<td></td>
</tr>
<tr>
<td>NACHSORT</td>
<td>L 1</td>
<td>HD data as postsorted values</td>
<td></td>
</tr>
<tr>
<td>DRRATE</td>
<td>F 19</td>
<td>Updating to the output (for zenon DDE server, in [s], one decimal possible)</td>
<td></td>
</tr>
<tr>
<td>HYST_PLUS</td>
<td>F 16</td>
<td>Positive hysteresis, from measuring range</td>
<td></td>
</tr>
<tr>
<td>HYST_MINUS</td>
<td>F 16</td>
<td>Negative hysteresis, from measuring range</td>
<td></td>
</tr>
<tr>
<td>PRIOR</td>
<td>N 16</td>
<td>Priority of the variable</td>
<td></td>
</tr>
<tr>
<td>REAMATRIZE</td>
<td>C 32</td>
<td>Allocated reaction matrix</td>
<td></td>
</tr>
<tr>
<td>ERSATZWERT</td>
<td>F 16</td>
<td>Substitute value, from measuring range</td>
<td></td>
</tr>
<tr>
<td>SOLLMIN</td>
<td>F 16</td>
<td>Minimum for set value actions, from measuring range</td>
<td></td>
</tr>
<tr>
<td>SOLLMAX</td>
<td>F 16</td>
<td>Maximum for set value actions, from measuring range</td>
<td></td>
</tr>
<tr>
<td>VOMSTANDBY</td>
<td>L 1</td>
<td>Get value from standby server; the value of the variable is not requested from the server but from the Standby Server in redundant networks</td>
<td></td>
</tr>
<tr>
<td>RESOURCE</td>
<td>C 128</td>
<td>Resources label. Free string for export and display in lists. The length can be limited using the MAX_LAENGE entry in project.ini.</td>
<td></td>
</tr>
<tr>
<td>ADJWVBA</td>
<td>L 1</td>
<td>Non-linear value adaptation: 0: Non-linear value adaption is used 1: Non-linear value adaption is not used</td>
<td></td>
</tr>
</tbody>
</table>
Creating variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Type</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADJZENON</td>
<td>C</td>
<td>128</td>
<td>Linked VBA macro for reading the variable value for non-linear value adjustment.</td>
</tr>
<tr>
<td>ADJWVBA</td>
<td>C</td>
<td>128</td>
<td>ed VBA macro for writing the variable value for non-linear value adjustment.</td>
</tr>
<tr>
<td>ZWREMA</td>
<td>N</td>
<td>16</td>
<td>Linked counter REMA.</td>
</tr>
<tr>
<td>MAXGRAD</td>
<td>N</td>
<td>16</td>
<td>Gradient overflow for counter REMA.</td>
</tr>
</tbody>
</table>

⚠️ **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:
<table>
<thead>
<tr>
<th>Identification</th>
<th>Type</th>
<th>Field size</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>AKTIV1</td>
<td>L</td>
<td>1</td>
<td>Limit value active (per limit value available)</td>
</tr>
<tr>
<td>GRENZWERT1</td>
<td>F</td>
<td>20</td>
<td>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)</td>
</tr>
<tr>
<td>SCHWERT1</td>
<td>F</td>
<td>16</td>
<td>Threshold value for limit value</td>
</tr>
<tr>
<td>HYSTERESE1</td>
<td>F</td>
<td>14</td>
<td>Is not used</td>
</tr>
<tr>
<td>BLINKEN1</td>
<td>L</td>
<td>1</td>
<td>Set blink attribute</td>
</tr>
<tr>
<td>BTB1</td>
<td>L</td>
<td>1</td>
<td>Logging in CEL</td>
</tr>
<tr>
<td>ALARM1</td>
<td>L</td>
<td>1</td>
<td>Alarm</td>
</tr>
<tr>
<td>DRUCKEN1</td>
<td>L</td>
<td>1</td>
<td>Printer output (for CEL or Alarm)</td>
</tr>
<tr>
<td>QUITTIER1</td>
<td>L</td>
<td>1</td>
<td>Must be acknowledged</td>
</tr>
<tr>
<td>LOESCHE1</td>
<td>L</td>
<td>1</td>
<td>Must be deleted</td>
</tr>
<tr>
<td>VARIABLE1</td>
<td>L</td>
<td>1</td>
<td>Dyn. limit value linking the limit is defined by an absolute value (see field GRENZWERTx).</td>
</tr>
<tr>
<td>FUNC1</td>
<td>L</td>
<td>1</td>
<td>Functions linking</td>
</tr>
<tr>
<td>ASK_FUNC1</td>
<td>L</td>
<td>1</td>
<td>Execution via Alarm Message List</td>
</tr>
<tr>
<td>FUNC_NR1</td>
<td>N</td>
<td>10</td>
<td>ID number of the linked function (if “-1” is entered here, the existing function is not overwritten during import)</td>
</tr>
<tr>
<td>A_GRUPPE1</td>
<td>N</td>
<td>10</td>
<td>Alarm/Event Group</td>
</tr>
<tr>
<td>A_KLASSE1</td>
<td>N</td>
<td>10</td>
<td>Alarm/Event Class</td>
</tr>
<tr>
<td>MIN_MAX1</td>
<td>C</td>
<td>3</td>
<td>Minimum, Maximum</td>
</tr>
<tr>
<td>FARBE1</td>
<td>N</td>
<td>10</td>
<td>Color as Windows coding</td>
</tr>
<tr>
<td>GRENZTXT1</td>
<td>C</td>
<td>66</td>
<td>Limit value text</td>
</tr>
<tr>
<td>A_DELAY1</td>
<td>N</td>
<td>10</td>
<td>Time delay</td>
</tr>
<tr>
<td>INVISIBLE1</td>
<td>L</td>
<td>1</td>
<td>Invisible</td>
</tr>
</tbody>
</table>

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.

### 7.4.3 Online import
ONLINE IMPORT OF VARIABLES

From zenon version 6.0, you can create variables automatically. If “import variables online” is selected, it can be chosen in the context menu of the driver, which kind of variable and which kind of PLC should be imported.

After confirming the variable types with “ok”, the existing variables of the selected type are read from the PLC. After that the variables are displayed in a list:

Now, the required variables can be selected and after the confirmation with “ok” the variables are created in the zenon project.

7.5 Driver variables

The driver kit implements a number of driver variables. These are divided into:

- Information
- Configuration
Creating variables

- Statistics and
- Error message

The definitions of the variables implemented in the driver kit are available in the import file `drvvar.dbf` (on the installation medium in the `\Predefined\Variables` folder) and can be imported from there.

**Note:** Variable names must be unique in zenon. If driver variables are to be imported from `drvvar.dbf` again, the variables that were imported beforehand must be renamed.
Information

Not every driver supports all driver variants.
For example:

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

<table>
<thead>
<tr>
<th>Name from import</th>
<th>Type</th>
<th>Offset</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MainVersion</td>
<td>UINT</td>
<td>0</td>
<td>Main version number of the driver.</td>
</tr>
<tr>
<td>SubVersion</td>
<td>UINT</td>
<td>1</td>
<td>Sub version number of the driver.</td>
</tr>
<tr>
<td>BuildVersion</td>
<td>UINT</td>
<td>29</td>
<td>Build version number of the driver.</td>
</tr>
<tr>
<td>RTMajor</td>
<td>UINT</td>
<td>49</td>
<td>zenon main version number</td>
</tr>
<tr>
<td>RTMinor</td>
<td>UINT</td>
<td>50</td>
<td>zenon sub version number</td>
</tr>
<tr>
<td>RTSp</td>
<td>UINT</td>
<td>51</td>
<td>zenon Service Pack number</td>
</tr>
<tr>
<td>RTBuild</td>
<td>UINT</td>
<td>52</td>
<td>zenon build number</td>
</tr>
<tr>
<td>LineStateIdle</td>
<td>BOOL</td>
<td>24.0</td>
<td>TRUE, if the modem connection is idle</td>
</tr>
<tr>
<td>LineStateOffering</td>
<td>BOOL</td>
<td>24.1</td>
<td>TRUE, if a call is received</td>
</tr>
<tr>
<td>LineStateAccepted</td>
<td>BOOL</td>
<td>24.2</td>
<td>The call is accepted</td>
</tr>
<tr>
<td>LineStateDialtone</td>
<td>BOOL</td>
<td>24.3</td>
<td>Dialtone recognized</td>
</tr>
<tr>
<td>LineStateDialing</td>
<td>BOOL</td>
<td>24.4</td>
<td>Dialing active</td>
</tr>
<tr>
<td>LineStateRingBack</td>
<td>BOOL</td>
<td>24.5</td>
<td>While establishing the connection</td>
</tr>
<tr>
<td>LineStateBusy</td>
<td>BOOL</td>
<td>24.6</td>
<td>Target station is busy</td>
</tr>
</tbody>
</table>
Creating variables

<table>
<thead>
<tr>
<th>Name from import</th>
<th>Type</th>
<th>Offset</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LineStateSpecialInfo</td>
<td>BOOL</td>
<td>24.7</td>
<td>Special status information received</td>
</tr>
<tr>
<td>LineStateConnected</td>
<td>BOOL</td>
<td>24.8</td>
<td>Connection established</td>
</tr>
<tr>
<td>LineStateProceeding</td>
<td>BOOL</td>
<td>24.9</td>
<td>Dialing completed</td>
</tr>
<tr>
<td>LineStateOnHold</td>
<td>BOOL</td>
<td>24.10</td>
<td>Connection in hold</td>
</tr>
<tr>
<td>LineStateConferenced</td>
<td>BOOL</td>
<td>24.11</td>
<td>Connection in conference mode.</td>
</tr>
<tr>
<td>LineStateOnHoldPendConf</td>
<td>BOOL</td>
<td>24.12</td>
<td>Connection in hold for conference</td>
</tr>
<tr>
<td>LineStateOnHoldPendTransfer</td>
<td>BOOL</td>
<td>24.13</td>
<td>Connection in hold for transfer</td>
</tr>
<tr>
<td>LineStateDisconnected</td>
<td>BOOL</td>
<td>24.14</td>
<td>Connection terminated</td>
</tr>
<tr>
<td>LineStateUnknown</td>
<td>BOOL</td>
<td>24.15</td>
<td>Connection status unknown</td>
</tr>
<tr>
<td>ModemStatus</td>
<td>UDINT</td>
<td>24</td>
<td>Current modem status</td>
</tr>
<tr>
<td>TreiberStop</td>
<td>BOOL</td>
<td>28</td>
<td>Driver stopped</td>
</tr>
<tr>
<td>SimulRTState</td>
<td>UDINT</td>
<td>60</td>
<td>Informs the status of Runtime for driver simulation.</td>
</tr>
</tbody>
</table>

**CONFIGURATION**

<table>
<thead>
<tr>
<th>Name from import</th>
<th>Type</th>
<th>Offset</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ReconnectInRead</td>
<td>BOOL</td>
<td>27</td>
<td>If TRUE, the modem is automatically reconnected for reading</td>
</tr>
<tr>
<td>ApplyCom</td>
<td>BOOL</td>
<td>36</td>
<td>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).</td>
</tr>
<tr>
<td>ApplyModem</td>
<td>BOOL</td>
<td>37</td>
<td>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.</td>
</tr>
<tr>
<td>Variable</td>
<td>Type</td>
<td>Offset</td>
<td>Description</td>
</tr>
<tr>
<td>---------------------</td>
<td>--------</td>
<td>--------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>PhoneNumberSet</td>
<td>STRING</td>
<td>38</td>
<td>Telephone number, that should be used</td>
</tr>
<tr>
<td>ModemHwAdrSet</td>
<td>DINT</td>
<td>39</td>
<td>Hardware address for the telephone number</td>
</tr>
<tr>
<td>GlobalUpdate</td>
<td>UDINT</td>
<td>3</td>
<td>Update time in milliseconds (ms).</td>
</tr>
<tr>
<td>BGlobalUpdaten</td>
<td>BOOL</td>
<td>4</td>
<td>TRUE, if update time is global</td>
</tr>
<tr>
<td>TreiberSimul</td>
<td>BOOL</td>
<td>5</td>
<td>TRUE, if driver in sin simulation mode</td>
</tr>
<tr>
<td>TreiberProzab</td>
<td>BOOL</td>
<td>6</td>
<td>TRUE, if the variables update list should be kept in the memory</td>
</tr>
<tr>
<td>ModemActive</td>
<td>BOOL</td>
<td>7</td>
<td>TRUE, if the modem is active for the driver</td>
</tr>
<tr>
<td>Device</td>
<td>STRING</td>
<td>8</td>
<td>Name of the serial interface or name of the modem</td>
</tr>
<tr>
<td>ComPort</td>
<td>UINT</td>
<td>9</td>
<td>Number of the serial interface.</td>
</tr>
<tr>
<td>Baudrate</td>
<td>UDINT</td>
<td>10</td>
<td>Baud rate of the serial interface.</td>
</tr>
<tr>
<td>Parity</td>
<td>SINT</td>
<td>11</td>
<td>Parity of the serial interface</td>
</tr>
<tr>
<td>ByteSize</td>
<td>USINT</td>
<td>14</td>
<td>Number of bits per character of the serial interface</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Value = 0 if the driver cannot establish any serial connection.</td>
</tr>
<tr>
<td>StopBit</td>
<td>USINT</td>
<td>13</td>
<td>Number of stop bits of the serial interface</td>
</tr>
<tr>
<td>Autoconnect</td>
<td>BOOL</td>
<td>16</td>
<td>TRUE, if the modem connection should be established automatically for reading/writing</td>
</tr>
<tr>
<td>PhoneNumber</td>
<td>STRING</td>
<td>17</td>
<td>Current telephone number</td>
</tr>
<tr>
<td>ModemHwAdr</td>
<td>DINT</td>
<td>21</td>
<td>Hardware address of current telephone number</td>
</tr>
<tr>
<td>RxIdleTime</td>
<td>UINT</td>
<td>18</td>
<td>Modem is disconnected, if no data transfer occurs for this time in seconds (s)</td>
</tr>
</tbody>
</table>
### Creating variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Type</th>
<th>Offset</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WriteTimeout</td>
<td>UDINT</td>
<td>19</td>
<td>Maximum write duration for a modem connection in milliseconds (ms).</td>
</tr>
<tr>
<td>RingCountSet</td>
<td>UDINT</td>
<td>20</td>
<td>Number of ringing tones before a call is accepted</td>
</tr>
<tr>
<td>ReCallIdleTime</td>
<td>UINT</td>
<td>53</td>
<td>Waiting time between calls in seconds (s).</td>
</tr>
<tr>
<td>ConnectTimeout</td>
<td>UINT</td>
<td>54</td>
<td>Time in seconds (s) to establish a connection.</td>
</tr>
</tbody>
</table>

#### STATISTICS

<table>
<thead>
<tr>
<th>Name from import</th>
<th>Type</th>
<th>Offset</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MaxWriteTime</td>
<td>UDINT</td>
<td>31</td>
<td>The longest time in milliseconds (ms) that is required for writing.</td>
</tr>
<tr>
<td>MinWriteTime</td>
<td>UDINT</td>
<td>32</td>
<td>The shortest time in milliseconds (ms) that is required for writing.</td>
</tr>
<tr>
<td>MaxBlkReadTime</td>
<td>UDINT</td>
<td>40</td>
<td>Longest time in milliseconds (ms) that is required to read a data block.</td>
</tr>
<tr>
<td>MinBlkReadTime</td>
<td>UDINT</td>
<td>41</td>
<td>Shortest time in milliseconds (ms) that is required to read a data block.</td>
</tr>
<tr>
<td>WriteErrorCount</td>
<td>UDINT</td>
<td>33</td>
<td>Number of writing errors</td>
</tr>
<tr>
<td>ReadSucceedCount</td>
<td>UDINT</td>
<td>35</td>
<td>Number of successful reading attempts</td>
</tr>
</tbody>
</table>
### Creating variables

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Offset</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MaxCycleTime</td>
<td>UDINT</td>
<td>22</td>
<td>Longest time in milliseconds (ms) required to read all requested data.</td>
</tr>
<tr>
<td>MinCycleTime</td>
<td>UDINT</td>
<td>23</td>
<td>Shortest time in milliseconds (ms) required to read all requested data.</td>
</tr>
<tr>
<td>WriteCount</td>
<td>UDINT</td>
<td>26</td>
<td>Number of writing attempts</td>
</tr>
<tr>
<td>ReadErrorCount</td>
<td>UDINT</td>
<td>34</td>
<td>Number of reading errors</td>
</tr>
<tr>
<td>MaxUpdateTimeNormal</td>
<td>UDINT</td>
<td>56</td>
<td>Time since the last update of the priority group Normal in milliseconds (ms).</td>
</tr>
<tr>
<td>MaxUpdateTimeHigher</td>
<td>UDINT</td>
<td>57</td>
<td>Time since the last update of the priority group Higher in milliseconds (ms).</td>
</tr>
<tr>
<td>MaxUpdateTimeHigh</td>
<td>UDINT</td>
<td>58</td>
<td>Time since the last update of the priority group High in milliseconds (ms).</td>
</tr>
<tr>
<td>MaxUpdateTimeHighest</td>
<td>UDINT</td>
<td>59</td>
<td>Time since the last update of the priority group Highest in milliseconds (ms).</td>
</tr>
<tr>
<td>PokeFinish</td>
<td>BOOL</td>
<td>55</td>
<td>Goes to 1 for a query, if all current pokes were executed</td>
</tr>
</tbody>
</table>

### Error Message

<table>
<thead>
<tr>
<th>Name from import</th>
<th>Type</th>
<th>Offset</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ErrorTimeDW</td>
<td>UDINT</td>
<td>2</td>
<td>Time (in seconds since 1.1.1970), when the last error occurred.</td>
</tr>
<tr>
<td>ErrorTimeS</td>
<td>STRING</td>
<td>2</td>
<td>Time (in seconds since 1.1.1970), when the last error occurred.</td>
</tr>
<tr>
<td>RdErrPrimObj</td>
<td>UDINT</td>
<td>42</td>
<td>Number of the PrimObject, when the last reading error occurred.</td>
</tr>
<tr>
<td>RdErrStationsName</td>
<td>STRING</td>
<td>43</td>
<td>Name of the station, when the last reading error occurred.</td>
</tr>
<tr>
<td>RdErrBlockCount</td>
<td>UINT</td>
<td>44</td>
<td>Number of blocks to read when the last reading error occurred.</td>
</tr>
</tbody>
</table>
8. Driver-specific functions

The driver supports the following functions:

**CREATING A “STANDARD” VARIABLE.**

(Sensor, Button, Analog joint, Analog output, Digital output, Switch, Bit.)

The value entered under “Offset” is used as index.

For example:
To create a sensor variable for sensor 2 (SP2), a new variable of the type “sensor” is created and the offset value “2” is set.

Under “Net address”, enter the connection number configured in the driver configuration. Chose any “identification” and “name”.

CREATING A MULTIVARIABLE

In order to read other parameters, it is possible to create a variable of the type „multi variable“. Depending on the parameter type, a float and a bit variable can be created.
For example to read the “H” parameter of sensor 1, a variable of the type “multivariable float” has to be created.

Under „name“ the desired name has to be entered, followed by a ":" and the description of the parameters (S1(H) that will be read.

CREATING AN ALARM VARIABLE

The PLC will send alarm telegrams if an alarm occurs. zenon will only react to an alarm for which there is an alarm variable. Just like a „normal“ variable, station number, identification and name (description) has to be entered. The entered “name” requires a string as described below:
### Parameters

<table>
<thead>
<tr>
<th>Character 1-2</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;:O&quot;</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Character 2-4</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Station number (&quot;024&quot;)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Character 5</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item Type according to Trend Documentation (&quot;S&quot;)</td>
<td></td>
</tr>
<tr>
<td>S - Sensor</td>
<td></td>
</tr>
<tr>
<td>L - Loop</td>
<td></td>
</tr>
<tr>
<td>H - Schedule</td>
<td></td>
</tr>
<tr>
<td>D - Driver</td>
<td></td>
</tr>
<tr>
<td>I – Digital Input</td>
<td></td>
</tr>
<tr>
<td>G – General Alarms</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Character 6-8</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item Number (&quot;001&quot;)</td>
<td></td>
</tr>
</tbody>
</table>

Depending on the alarm code, the alarm variable gets a value, that for example is analyzed with a reaction matrix.
![CREATING A TRIGGER VARIABLE](image)

Under “offset”, enter the sensor that shall request the values. The entered “name” requires a string as described below:

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Character 1-3</td>
<td>“:I=”</td>
</tr>
<tr>
<td>Character 4-</td>
<td>Interval</td>
</tr>
</tbody>
</table>

“.I=3;” means interval 3.

The different intervals are defined as followed:
The driver supports two different types of logging. Therefore an additional variable name has to be defined whether "compact logging" of "full-precision logging" should be used. This is defined with an additional parameter in the variable name.

Full Precision : ":C=0;"
Compact : ":C=1;"

The driver supports two different types of logging. Therefore an additional variable name has to be defined whether "compact logging" of "full-precision logging" should be used. This is defined with an additional parameter in the variable name.

Full Precision : ":C=0;"
Compact : ":C=1;"

Attention

Although Compact-logging is much faster than full-precision logging, the exactness of values with full-precision is much higher. With compact logging data for e.g. 1000 values are packed into 12 telegrams, with full precision the same data amount is sent in 200 telegrams.

In addition to a trigger variable, an RDA-variable also has to be defined. Creating an RDA variable works exactly as creating a normal sensor variable. There is only one difference: under "Extended", you have to activate "Save to hard disc".
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
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drivers</td>
<td>Drop-down list with all drivers which are loaded in the project.</td>
</tr>
<tr>
<td>Current status</td>
<td>Fixed entry which has no function in the current version.</td>
</tr>
<tr>
<td>Driver command</td>
<td>Drop-down list for the selection of the command.</td>
</tr>
<tr>
<td>Start driver (online mode)</td>
<td>Driver is reinitialized and started.</td>
</tr>
<tr>
<td>Stop driver (offline mode)</td>
<td>Driver is stopped. No new data is accepted.</td>
</tr>
<tr>
<td></td>
<td>Note: If the driver is in offline mode, all variables that were created for this driver receive the status switched off (OFF; Bit 20).</td>
</tr>
<tr>
<td>Driver in simulation mode</td>
<td>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.</td>
</tr>
<tr>
<td>Driver in hardware mode</td>
<td>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.</td>
</tr>
<tr>
<td>Driver-specific command</td>
<td>Enter driver-specific commands. Opens input field in order to enter a command.</td>
</tr>
<tr>
<td>Driver – activate set setpoint value</td>
<td>Write set value to a driver is allowed.</td>
</tr>
<tr>
<td>Driver – deactivate set setpoint value</td>
<td>Write set value to a driver is prohibited.</td>
</tr>
<tr>
<td>Establish connecton with modem</td>
<td>Establish connection (for modem drivers) Opens the input fields for the hardware address and for the telephone number.</td>
</tr>
<tr>
<td>Disconnect from modem</td>
<td>Terminate connection (for modem drivers)</td>
</tr>
<tr>
<td>Show this dialog in the Runtime</td>
<td>The dialog is shown in Runtime so that changes can be made.</td>
</tr>
</tbody>
</table>

**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.
10. Error analysis

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

10.1 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.

### 10.2 Error numbers

In case of communication problems an entry in the error log file of the driver is generated; here the error cause is stated with a number.

<table>
<thead>
<tr>
<th>Error number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-10</td>
<td>Receive tries exceeded</td>
</tr>
<tr>
<td>-11</td>
<td>No response received from converter</td>
</tr>
<tr>
<td>-12</td>
<td>First character is no STX.</td>
</tr>
<tr>
<td>-13</td>
<td>Data not received.</td>
</tr>
<tr>
<td>-14</td>
<td>Synchronization error</td>
</tr>
<tr>
<td>-20</td>
<td>Writing tries exceeded</td>
</tr>
<tr>
<td>-21</td>
<td>Writing permission not received.</td>
</tr>
<tr>
<td>-22</td>
<td>Writing error</td>
</tr>
<tr>
<td>-40</td>
<td>Exit due to program end</td>
</tr>
<tr>
<td>Positive</td>
<td>Error code according to RK512</td>
</tr>
</tbody>
</table>

### 10.3 Check list

Is the PLC connected to the power supply?

Are the participants available in the TCP/IP network?

Can the PLC be reached via the PING command?

Can the PLC be reached via TELNET?
Are the PLC and the PC connected with the right cable?

Did you select the right COM port?

Do the communication parameters match (Baud rate, parity, start/stop bits,...)?

Is the COM port blocked by another application?

Did you configure the net address correctly, both in the driver dialog and in the address properties of the variable?

Did you use the right object type for the variable?

Does the offset addressing of the variable match the one in the PLC?

Use the DiagViewer for further analysis -> Which messages does it show?