

# **zenon driver manual** HITACHI

v.7.10



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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. HITACHI

This driver is used for connecting to PLCs by HITACHI via the COM-H protocol.

#### CONNECTION

The PLC is connected to the serial port RS232 (COM) of the PC with a serial cable. Please use original Hitachi cables!

HW settings at the HITACHI communication processor COMM-2H: DSW 1: OFF-ON-ON-ON-ON-OFF-ON 19200;7,e,1 checksum activated. SW6 stands at 1; switch position 2 was also tested.

# 2.1 HITACHI - Data sheet

General:	
Driver file name	HITACHI.exe
Driver name	Hitachi
PLC types	All H-series processors are supported.
PLC manufacturer	Hitachi;

Driver supports:	
Protocol	COM-H;
Addressing: Address-based	x
Addressing: Name-based	-
Spontaneous communication	-
Polling communication	x
Online browsing	-
Offline browsing	-
Real-time capable	-
Blockwrite	-
Modem capable	-



Serial logging	x
RDA numerical	-
RDA String	-

Prerequisites:	
Hardware PC	RS 232 interface
Software PC	-
Hardware PLC	-
Software PLC	-
Requires v-dll	-

Platforms:	
Operating systems	Windows CE 5.0, CE 6.0; Windows Vista, 7, 8, Server 2008/R2, Server 2012;
CE platforms	x86; ARM;

# 2.2 Driver history

Date	Driver version	Change
07.07.08	600	Created driver documentation



# 2.3 Requirements

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

# 2.4 Configuration

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

# 💡 Info

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

#### 2.4.1 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.

Definition of driver				
Available drivers				
🖃 🖶 🛋 3S 🔹 🔺				
Codesys Arti NG SoftPLC driver				
Codesys Arti SoftPLC driver				
Codesys SoftPLC driver				
ABB				
🗄 💼 💼 AEG				
🗄 🖷 💼 Allen-Bradley				
🗄 🖷 💼 Alstom				
🗄 💼 Apex				
🗄 🖷 Applicom				
🗄 🖷 💼 Archive				
🗄 🖷 Arcnet				
🗄 🖷 Areva				
🗄 💼 Asfinag				
Bachmann				
n 🖻 DACont				
Driver name				
Codesys Arti NG driver				
Driver information				
Description: Codesys Soft PLC driver "New Generation" for the Codesys 3S-ARTI (Asynchron Runtime				
Interface) interface. The driver supports direct variable import from the Codesys development				
environment and replaces the Codesys Arti Soft PLC driver.				
Supported PLC types:				
Codesys Soft PLCs, Moeller XControl PLCs XC200 and XC600, and Elau PacDrive Controller MAX 4, C200, C400, C600, P600.				
Supported connection types:				
Ethernet; Local				
·				
OK Cancel Help				

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 ox. 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.

# 💡 Info

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.

#### 2.4.2 Settings in the driver dialog

You can change the following settings of the driver:

#### General

Configuration			X
General			
			ОК
Mode:			Cancel
Hardware	•		Help
Keep update list in me	emory		
Outputs writeable			
Variable image remane	ent		
Stopped on Standby-S	Server		
Update time global Global updatetime in ms:			
1000			
Priority normal: [100	10 ms		
high: 500	) ms		
higher: 300			
highest: 100	ms		



Parameter	Description
Mode	<ul> <li>Allows to switch between hardware mode and simulation mode</li> <li>Hardware: <ul> <li>A connection to the control is established.</li> </ul> </li> <li>Simulation static</li> <li>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.</li> <li>Simulation - counting</li> <li>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</li> </ul>
	<ul> <li>automatically.</li> <li>Simulation - programmed</li> <li>N 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).</li> </ul>
Keep update list in the memory	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.
Output can be written	Aktiv: Outputs can be written. Inactive: Writing of outputs is prevented. Note: Not available for every driver.



Variable image remanent	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.
	The variable image is saved in mode hardware if:
	<ul> <li>one of the states S_MERKER_1(0) up to S_MERKER8(7), REVISION(9), AUS(20) or ERSATZWERT(27) is active</li> </ul>
	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 at the 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.
	<b>Attention:</b> If this option is active, the gapless archiving is no longer guaranteed.
	Aktiv: 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) but an empty value. This prevents that at the upgrade to the Server irrelevant values are created in the AML, CEL and Historian.
Global Update time	Aktiv: 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	Here you set the polling times for the individual priorities. All variables with the according priority are polled in the set time. The allocation is taken

	place for each variable 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.
ОК	Accepts settings in all tabs and closes dialog.
Cancel	Discards all changes and closes the dialog.
Help	Opens online help.

#### UPDATE TIME FOR CYCLICAL DRIVER

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.

#### **Driver dialog Com**

Configuration		
General Com Option		ОК
		<u>C</u> ancel
Com:	Baudrate: 19200 💌	
Databit: 7 💌	Parity: Even ▼	
Stopbit:	Protocol: RTS/CTS	

The settings shown above are the default settings for communication via the interface at the processor and at the co-processor.



#### Driver dialog options

This page contains driver-specific settings.



Parameters	Description
New CPU Type	Depending on the configured CPU, the task code 0x40 or 0xA0 is used. Consult your HITACHI PLC documentation for further information.

# 2.5 Creating variables

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

### 2.5.1 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

Workspace 'C:\WSP6_PRJ A	•	) =	🖻 🖦 🗙   🏭 🗸	**	XML 43 43	🏹 🗕 🌾	🖌 ९९ 🤻	<b>a</b> 🕖	
😑 🚯 Variables	Status	Name $\triangle$		nnit Unit	Net address	Data block	Offset	Bit num	Alignm
Driver			Filter text	Filter	Filter text 🗹 Fi	iter text 📝	Filter text 📔	Filter 🔽	Filter
Datatypes Reaction m		drv_a <sup>rith</sup>	motic		n	0	0	0	0
Allocations		drv_C	Variable new		Ins	0	0	0	0
		drv_E	Create standard f	unction		0	0	0	0
Units		drv_N				0	0	0	0
🕀 🖅 Screens		drv_N	Linked elements		•	0	0	0	0
Functions		drv_N	Сору		Ctrl+C	0	0	0	0
		drv_N				0	0	0	0
		drv_N	Paste		Ctrl+V	0	0	0	0
Time control		drv_S	Delete		Del	0	0	0	0
electricit     e	+-	Interr	Expand/collapse	nodo	,	0	0	0	0
- S straton (IEC 6113	+-	Interr		noue	,	0	0	0	0
Production & Facility	+-	Interr	Activate all			0	0	0	0
- Interlockings			Activate						
- E Command			Deactivate						
- 👜 Energy Managemer									
- 🔋 Message Control			Export XML select	ed					
- 2 Menus			Import XML						
Ser administrati			Extended import/e	export	,				
SAP interface			Enterrace imperior	suport.					
🗉 🗁 Files			Extended filter		•				
			Remove all filter						
- 🔶 Projektsicherun	•								
		otal / 1:	Edit selected cell		F2	able			

- 2. The dialog for configuring variables is opened
- 3. configure the variable

te variable		
Settings		
Name: S_Variable		
S_Variable		
Driver		
SIMUL32 - SIMUL_W	12	•
Driver object type		
PLC marker		•
Datatype		
REAL		
Array settings		
Start index is 0		
Start index is 1		
Dim 1	Dim 2	Dim 3
0	0	0
Addressing options		
Automatic address     Automatic addr	sing	
Addressing accord	ing to data type offset a	nd start offset
Manual addressing		
Each datatype sta		
- coor obtatype ata	a marmen offset	
Automatic addressing		
Activate all elemer	nts	
Activate element r	nanually	
B	ack Finish	Cancel Help

# 4. The settings that are possible depends on the type of variables

Property	Description
Name	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 characters
	Attention: The # character is not permitted in variable names. If non- permitted characters are used, creation of variables cannot be completed and the Finish button remains inactive.
Drivers	Select the desired driver from the drop-down list. <b>Note:</b> 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.
Driver object type (cti.chm::/28685.h tm)	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 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.

#### 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.

# 2.5.2 Addressing

Properties	Description
Name	Freely definable name
	Achtung: the name must be unique within each control system project.
Identification	Any text can be entered here, e.g. for resource labels, comments
Net address	not used for this driver
Data block	Enter the data block here.
Offset	Offset of the variable; the memory address of the variable in the PLC. Configurable [0 4294967295]
	You can look up the exact maximum range for each data block in the manual of the PLC.
Alignment	not used for this driver
Bit number	Number of the bit within the configured offset.
	Allowed entry [0 65535], Working range [07]
String length	Only available for String variables: Maximum number of characters that the variable can take.
Driver object type	Depending on the employed driver, an object type is selected during the creation of the variable; the type can be changed here later.
Data type	Data type of the variable, which is selected during the creation of the variable; the type can be changed here later.
	Attention: If you change the data type later, all other properties of the variable must be checked and adjusted, if necessary.

# 💡 Info

Please make sure that you have activated the setting "Addresses in HEX" in the variable definition in the project properties of the control system. As most addresses in the Hitachi PLC are specified in hexadecimal notation, it is recommended to use this notation in the variable definition of the control system as well.

The variables of the group of timers/counters are an exception. They are addressed in decimal notation.

# 2.5.3 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.

#### **Driver objects**

The following object types are available in this driver:

Driver object type	Channel type	Read / Write	Supported data types	Comment
Output	11	R/W	BOOL, INT, UINT	
CPU link area	75	R / W	UDINT, DINT, BOOL, UINT, INT	
Data area	76	R / W	UDINT, DINT, BOOL, UINT, INT	
Input	10	R	BOOL, INT, UINT	
Elapsed Count Clear	70	R / W	BOOL	
Fall edge det (DFN)	79	R / W	BOOL	
Internal output (R)	66	R / W	BOOL	
Internal output (WR)	74	R/W	REAL, UDINT, DINT, BOOL, UINT, INT, STRING	
Rise edge det (DIF)	78	R / W	BOOL	
Timer/Cntr TD	69	R / W	BOOL	
Tmr/Cntr elapsed TC	77	R / W	UDINT, DINT, UINT, INT	
Driver variable	35	R / W	BOOL, SINT, USINT, INT, UINT, DINT, UDINT, REAL, STRING	Variables for the statistical analysis of communication. Find out more in the chapter about the Driver variables (on page 28)

#### **OBJECTS FOR PROCESS VARIABLES IN ZENON**

Object	Read / Write	Supported data types	Comment
Configuration			Opens the driver configuration menu
External Input	R	BOOL, INT, UINT	



External Output	R / W	BOOL, INT, UINT	Writing is only possible if it was unlocked in the driver dialog
CPU Link Area	R / W	BOOL, DINT, UDINT	
Data Area	R / W	BOOL, DINT, UDINT	
Internal Output	R / W	BOOL, DINT, UDINT, REAL,	
Timer/Cntr	R / W	INT, UINT	
Elapsed Count clear	R / W		
Rise edge det	R / W		
Fall edge det	R / W		

# 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	8
	USINT	9
	SINT	10
	UINT	2
	INT	1
	UDINT	4
	DINT	3
	ULINT	27
	LINT	26
	REAL	5
	LREAL	6



STRING	12
WSTRING	21
DATE	18
TIME	17
DATE_AND_TIME	20
TOD (Time of Day)	19

**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.

# 2.5.4 Creating variables by importing

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

#### 🂡 Info

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.

#### XML import of variables from another zenon project

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 INTwith 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.

#### **DBF Import/Export**

Data can be exported to and imported from dBase.

# 💡 Info

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 menu 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 menu of Extended export/import... select the Import dBase command
- 3. follow the export assistant

#### Attention

DBF files:

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

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

#### 💡 Info

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 there 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)

#### DESIGN

Description	Туре	Field size	Comment	
KANALNAME	Char	128	Variable name.	
			The length can be limited using the MAX_LAENGE entry in project.ini.	
KANAL_R	С	128	The original name of a variable that is to be replaced by the new name entered under "VARIABLENNAME" (field/column must be entered manually).	
			The length can be limited using the MAX_LAENGE entry in project.ini.	
KANAL_D	Log	1	The variable is deleted with the $\mathbb 1$ entry (field/column has to be created by hand).	
TAGNR	С	128	Identification.	
			The length can be limited using the MAX_LAENGE entry in project.ini.	
Unit	С	11	Technical unit	
DATENART	С	3	Data type (e.g. bit, byte, word,) corresponds to the data type.	
KANALTYP	С	3	Memory area in the PLC (e.g. marker area, data area,) corresponds to the driver object type.	
HWKANAL	Num	3	Bus address	
BAUSTEIN	N	3	Datablock address (only for variables from the data area of the PLC)	
ADRESSE	N	5	Offset	

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BITADR	N	2	For bit variables: bit address For byte variables: 0=lower, 8=higher byte For string variables: Length of string (max. 63 characters)	
ARRAYSIZE	N	16	Number of variables in the array for index variables ATTENTION: Only the first variable is fully available. All others are only available for VBA or the Recipe Group Manager	
LES_SCHR	R	1	Write-Read-Authorization 0: Not allowed to set value. 1: Allowed to set value.	
MIT_ZEIT	R	1	time stamp in zenon zenon (only if supported by the driver)	
OBJEKT	N	2	Driver-specific ID number of the primitive object comprises TREIBER-OBJEKTTYP and DATENTYP	
SIGMIN	Float	16	Non-linearized signal - minimum (signal resolution)	
SIGMAX	F	16	Non-linearized signal - maximum (signal resolution)	
ANZMIN	F	16	Technical value - minimum (measuring range)	
ANZMAX	F	16	Technical value - maximum (measuring range)	
ANZKOMMA	N	1	Number of decimal places for the display of the values (measuring range)	
UPDATERATE	F	19	Update rate for mathematics variables (in sec, one decimal possible) not used for all other variables	
MEMTIEFE	N	7	Only for compatibility reasons	
HDRATE	F	19	HD update rate for historical values (in sec, one decimal possible)	
HDTIEFE	N	7	HD entry depth for historical values (number)	
NACHSORT	R	1	HD data as postsorted values	
DRRATE	F	19	Updating to the output (for zenon DDE server, in [s], one decimpossible)	
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	С	32	Allocated reaction matrix	

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=	16	Substitute value, from measuring range
=	16	Minimum for set value actions, from measuring range
=	16	Maximum for set value actions, from measuring range
3	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
C	128	Resources label. Free string for export and display in lists. The length can be limited using the MAX_LAENGE entry in project.ini.
3	1	Non-linear value adaption: 0: Non-linear value adaption is used 1: Non-linear value adaption is not used
C	128	Linked VBA macro for reading the variable value for non-linear value adjustment.
C	128	ed VBA macro for writing the variable value for non-linear value adjustment.
N	16	Linked counter REMA.
N	16	Gradient overflow for counter REMA.
		1         1         128         1         128         128         128         128         128         16

#### ▲ 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 DEFINITION

Limit definition for limit values 1 to 4, and status 1 bis 4:

Description	Туре	Field size	Comment	
AKTIV1	R	1	Limit value active (per limit value available)	
GRENZWERT1	F	20	hnical value or ID number of a linked variable for a dynamic limit (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	
HYSTERESE1	F	14	Is not used	
BLINKEN1	R	1	Set blink attribute	
BTB1	R	1	Logging in CEL	
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	С	3	Minimum, Maximum	
FARBE1	N	10	Color as Windows coding	
GRENZTXT1	С	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.

#### 2.5.5 Treibervariablen

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

- Information
- Configuration
- Statistics and
- Error messages

The definitions of the variables defined in the driver kit are available in the import file drvvar.dbf (on the CD in the directory: CD Drive:/Predefined/Variables) 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.

# Info 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 a time

#### INFORMATION

Name from import	Туре	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	12:00 AM	Connection in hold
LineStateConferenced	BOOL	12:00 AM	Connection in conference mode.
LineStateOnHoldPendConf	BOOL	12:00 AM	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
TreiberStop	BOOL	28	Driver stopped For driver stop, the variable has the value TRUE and an OFF bit. After the driver has started, the variable has the value FALSE and no OFF bit.
SimulRTState	UDINT	60	Informs the status of Runtime for driver simulation.

#### CONFIGURATION

Name from import	Туре	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).
ApplyModem	BOOL	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	STRING	38	Telephone number, that should be used
ModemHwAdrSet	DINT	39	Hardware address for the telephone number
GlobalUpdate	UDINT	3	Update time in milliseconds (ms).
BGlobalUpdaten	BOOL	4	TRUE, if update time is global
TreiberSimul	BOOL	5	TRUE, if driver in sin simulation mode
TreiberProzab	BOOL	6	TRUE, if the variables update list should be

			kept in the memory
ModemActive	BOOL	7	TRUE, if the modem is active for the driver
Device	STRING	8	Name of the serial interface or name of the modem
ComPort	UINT	9	Number of the serial interface.
Baud rate	UDINT	10	Baud rate of the serial interface.
Parity	SINT	11	Parity of the serial interface
ByteSize	USINT	14	Number of bits per character of the serial interface
			Value = 0 if the driver cannot establish any serial connection.
StopBit	USINT	13	Number of stop bits of the serial interface.
Autoconnect	BOOL	16	TRUE, if the modem connection should be established automatically for reading/writing
PhoneNumber	STRING	17	Current telephone number
ModemHwAdr	DINT	21	Hardware address of current telephone number
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	Туре	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).
MaxUpdateTimeHigher	UDINT	57	Time since the last update of the priority group Higher in milliseconds (ms).
MaxUpdateTimeHigh	UDINT	58	Time since the last update of the priority group High in milliseconds (ms).
MaxUpdateTimeHighest	UDINT	59	Time since the last update of the priority group Highest in milliseconds (ms).



PokeFinish	BOOL	55	Goes to 1 for a query, if all current pokes were
			executed

#### ERROR MESSAGES

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

# 2.6 Driver-specific functions

This driver supports the following functions:

# 2.7 Driver commands

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

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

- create a new function
- ► select Variables -> Driver commands
- The dialog for configuration is opened

Driver commands	
Settings Driver STTCP32S7 TCP-IP Current status Priver Driver command <no commando=""></no>	<u>OK</u> Cancel Help
Show this dialog in the Runtime	

Parameters		Description
Drivers		Drop-down list with all drivers which are loaded in the project.
Current state		Fixed entry which has no function in the current version.
Driver commands		Drop-down list for the selection of the command.
Start driver ( mode)	online	Driver is reinitialized and started.
Stop driver (or mode)	ffline	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 switched off (OFF; Bit 20).
<ul> <li>Driver in simu mode</li> </ul>	lation	Driver is set into simulation mode. The values of all variables of the driver are simulated by the driver. No values from the connected hardware (e.g. PLC, bus

		system,) are displayed.
•	Driver in hardware mode	Driver is set into hardware mode. For the variables of the driver the values from the connected hardware (e.g. PLC, bus system,) are displayed.
•	Driver-specific command	Enter driver-specific commands. Opens input field in order to enter a command.
	Activate driver write set value	Write set value to a driver is allowed.
•	Deactivate driver write set value	Write set value to a driver is prohibited.
•	Establish connection with modem	Establish connection (for modem drivers) Opens the input fields for the hardware address and for the telephone number.
•	Disconnect from modem	Terminate connection (for modem drivers)
	ow this dialog in the ntime	The dialog is shown in Runtime so that changes can be made.

#### **DRIVER COMMANDS IN THE NETWORK**

If the computer, on which the driver command function is executed, is part of the zenon network, additional actions are carried out. A special network command is sent from the computer to the project server, which then executes the desired action on its driver. In addition, the Server sends the same driver command to the project standby. The standby also carries out the action on its driver.

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

# 2.8 Error analysis

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

#### 2.8.1 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 7.10 -> Diagviewer*.

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

C:\ProgramData\zenon\zenon7.10\LOG for zenon Version 7.10. 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 currently created entries live
- customize the logging settings
- change the folder in which the log files are saved

#### Hints:

- 1. In Windows CE even errors are not logged per default due to performance reasons.
- 2. The Diagnosis Viewer displays all entries in UTC (coordinated world time) and not in local time.
- 3. 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.
- 4. If you only use Error logging, the problem description is in column Error text. For other diagnosis level the description is in column General text.
- 5. For communication problems many drivers also log error numbers which the PLC assigns to them. They are displayed in Error text and/or Error code and/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.

6. 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.

# 💡 Info

You can find further information on the Diagnosis Viewer in the Diagnose Viewer (main.chm::/12464.htm) chapter.

#### 2.8.2 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.

Error number	Description
HW error:0	TIMEOUT during communication
HW error:1	
HW error:2	
HW error:3	
HW error:4	
HW error:5	
HW error:6	
HW error:7	
HW error:8	
HW error:9	

05.01.01 15:30:46 | [ERROR] Read Data HW=1 ADDR=4 COUNT=26 HW-Error:0 Para1=0 Para2=0



The line starts with the date and time of the error.

HW=1 .. refers to station address 1

ADDR=4 .. specifies that there was an attempt to read from address 4.

COUNT=26.. specifies that 26 words were supposed to be read.

#### 2.8.3 Check list

Cable disconnected

Check interface settings (7 BIT, even 1 Stopbit, 19200BAUD)

Check protocol type that is set for the communication processor. The driver was tested with switch positions "1" and "2".

Have you analyzed the driver communication error file (which errors have occured)?

In case of communication problems, the driver writes a detailed problem analysis into the driver communication error file. This file is stored in the project directory (RT\\FILES\\zenon\\custom\\log). The name of the file is \_<drivername>.txt

You can view this file with any text editor, e.g. Notepad.

For additional error analyses please send a project backup and the "error file" to the support.