



**COPADATA**  
do it your way

# zenon driver manual

## OMR\_FINS

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) (<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) (<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) (<mailto:sales@copadata.com>).

## 2. OMR\_FINS

### 2.1 OMR\_FINS - Data sheet

General:	
Driver file name	OMR_FINS.exe
Driver name	Omron FINS
PLC types	OMRON SYSMAC
PLC manufacturer	Omron;

Driver supports:	
Protocol	Omron FINS;
Addressing: Address-based	x
Addressing: Name-based	-
Spontaneous communication	-
Polling communication	x
Online browsing	-
Offline browsing	-
Real-time capable	-
Blockwrite	x
Modem capable	-
Serial logging	x

RDA numerical	-
RDA String	-

Prerequisites:	
Hardware PC	RS 232 serial interface, cable type: SYSMAC WAY; Standard network card
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	1300	Created driver documentation

## 2.3 Requirements

This chapter describes the requirements for using the driver.

### 2.3.1 PC

#### **HARDWARE**

Serial interface RS232 or standard network card (TCP/IP)

#### **SOFTWARE**

Copy the driver file OMR\_FINS.exe into the current program directory (unless it is already there) and enter it into the file TREIBER\_EN.XML with the tool driverinfo.exe.



#### **Info**

*Windows CE is not supported at the moment.*

## 2.4 Configuration

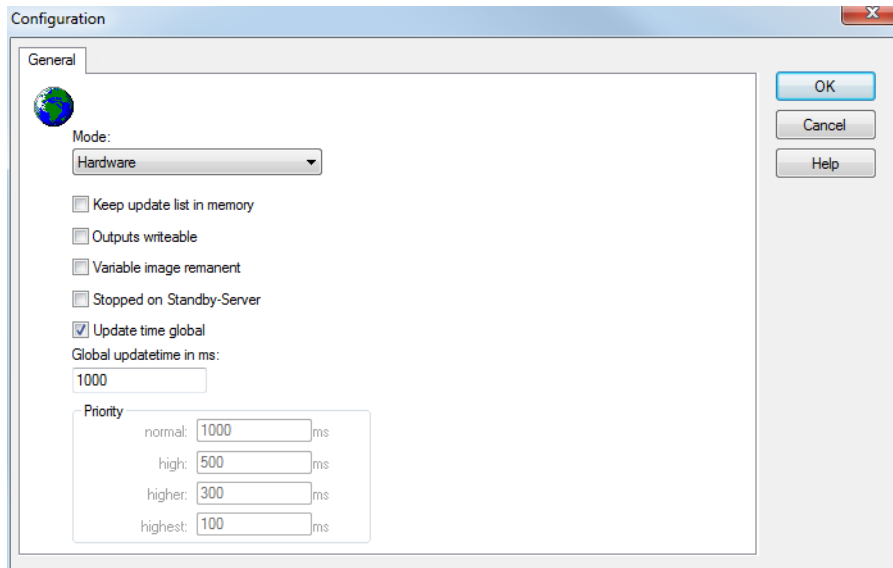
In this chapter you will learn how to use the driver in a project and which settings you can change.



#### **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 General





Parameter	Description
Mode	<p>Allows to switch between hardware mode and simulation mode</p> <ul style="list-style-type: none"> <li>▶ Hardware: <p>A connection to the control is established.</p> </li> <li>▶ Simulation static <p>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.</p> </li> <li>▶ Simulation - counting <p>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.</p> </li> <li>▶ Simulation - programmed <p>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).</p> </li> </ul>
Keep update list in the memory	<p>Variables which were requested once are still requested from the control even if they are currently not needed.</p> <p>This has the advantage that e.g. multiple screen switches after the screen was opened for the first time are executed faster because the variables need not be requested again. The disadvantage is a higher load for the communication to the control.</p>
Output can be written	<p>Aktiv: Outputs can be written.</p> <p>Inactive: Writing of outputs is prevented.</p> <p><b>Note:</b> Not available for every driver.</p>

Variable image remanent	<p>This option saves and restores the current value, time stamp and the states of a data point.</p> <p>Fundamental requirement: The variable must have a valid value and time stamp.</p> <p>The variable image is saved in mode hardware if:</p> <ul style="list-style-type: none"> <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> <p>The variable image is always saved if:</p> <ul style="list-style-type: none"> <li>▶ the variable is of the object type <code>Driver variable</code></li> <li>▶ the driver runs in simulation mode. (not programmed simulation)</li> </ul> <p>The following states are not restored at the start of the Runtime:</p> <ul style="list-style-type: none"> <li>▶ SELECT(8)</li> <li>▶ WR-ACK(40)</li> <li>▶ WR-SUC(41)</li> </ul> <p>The mode <code>Simulation - programmed</code> at the driver start is not a criterion in order to restore the remanent variable image.</p>
Stop at the Standby Server	<p>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.</p> <p><b>Attention:</b> If this option is active, the gapless archiving is no longer guaranteed.</p> <p><code>Aktiv:</code> 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 <code>switched off</code> (<code>statusverarbeitung.chm: /24150.htm</code>) but an empty value. This prevents that at the upgrade to the Server irrelevant values are created in the AML, CEL and Historian.</p>
Global Update time	<p><code>Aktiv:</code> The set <code>Global update time</code> in ms is used for all variables in the project. The priority set at the variables is not used.</p> <p><code>Inactive:</code> The set priorities are used for the individual variables.</p>
Priority	<p>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</p>

	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.
<b>OK</b>	Accepts settings in all tabs and closes dialog.
<b>Cancel</b>	Discards all changes and closes the dialog.
<b>Help</b>	Opens online help.

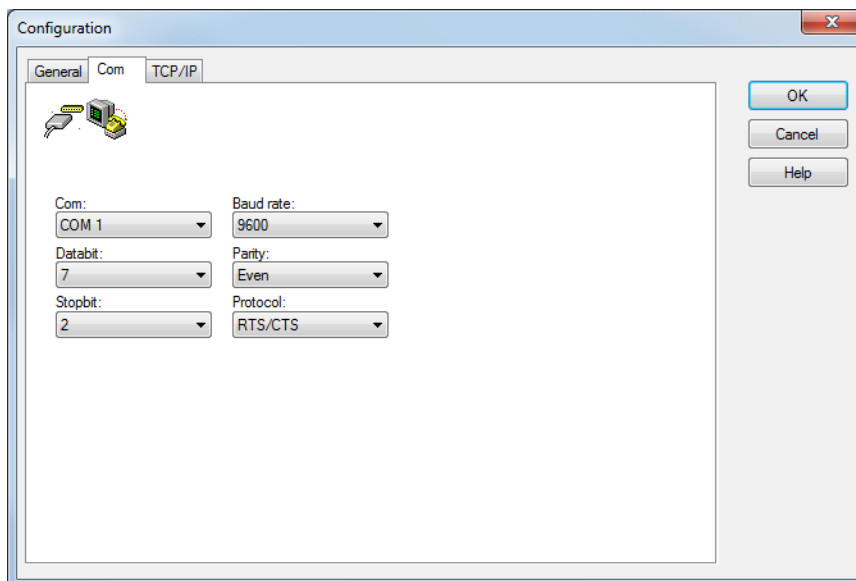
## UPDATE TIME FOR CYCLICAL DRIVER

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.

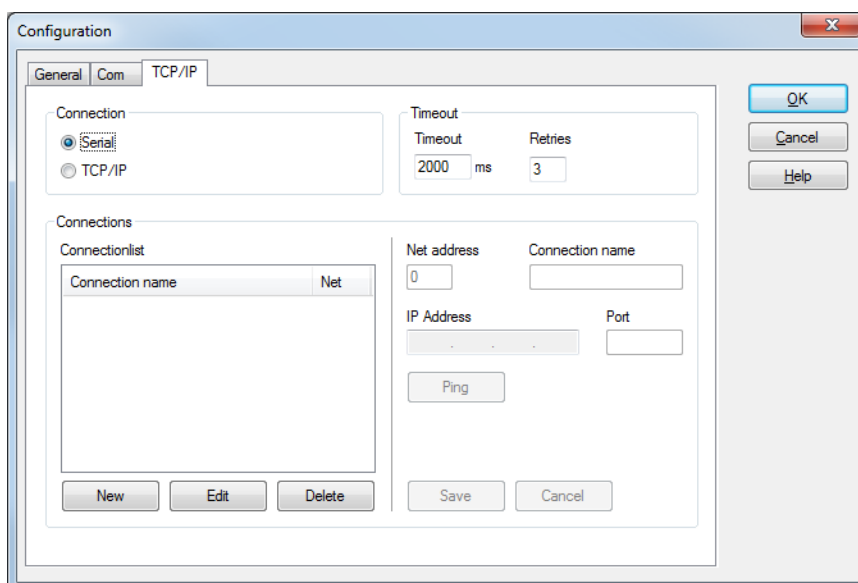
### 2.4.2 Com

Configuration of the communication parameters for the serial interface



Parameters	Description
Com	Selection of the serial interface, to which the PLC is connected.
Baud rate	Baud rate of the connection. Default: 9600
Data bit	Data word size in Bit: Default: 7
Parity	Settings for the parity of the connection Default: Even
Stop bit	Number of stopbits for the connection Default: 2
Protocol	Protocol of the connection. Default: RTS/CTS

### 2.4.3 TCP/IP



Parameters	Description
<b>Connection</b>	Selection of connection type.
Serial	Active: Serial connection is used.
TCP/IP	Active: TCP/IP connection is used.
<b>Timeout</b>	Options for Error response time.
Timeout	Waiting time for establishing a connection in milliseconds.
Repetitions	Number of retries if establishing a connection is not successful.
<b>Connections</b>	Settings of the connections.
<b>List of connections</b>	List of defined connections to PLCs.
Net address	Corresponds to the Net address property in variable configuration.
Connection name	Freely definable name.
IP address	Address of the PLC.
Port	Port address of PLC. You can find details in the manual of your PLC.
Ping	Sends a ping to the IP address that is configured for this connection. Allows the connection to the device to be tested. If the ping is concluded negatively, check the IP address and check to see if the device is online.
<b>New</b>	Establishes a new connection.
<b>Edit</b>	Opens highlighted connection for editing.
<b>Delete</b>	Deletes highlighted connection from the list.
<b>Save</b>	Accepts all changes for edited connection and closes editing option.
<b>Cancel</b>	Discards all changes for edited connection and closes editing option.
<b>OK</b>	Accept changes in the dialog and close dialog.  Only available if no connection is in the "edit" state.
<b>Cancel</b>	Discards all changes and closes the dialog.

Help	Opens online help.
------	--------------------

 **Info**

*Maximum number of connections: 256 (0-255).*

## 2.5 Addressing

### VARIABLE ADDRESSING VIA

Address

The variables are allocated to the memory area of the PLC by their offset.

 **Info**

*The addressing of the PLC is carried out as WORD. For uneven string length always one additional character is read or written.*

## 2.6 Driver objects and datatypes

### DRIVER OBJECT TYPES AND SUPPORTED IEC DATA TYPES FOR PROCESS VARIABLES IN THE CONTROL SYSTEM

Driver object types	Channel type	Supported datatypes (DataType)	Read	Write	Comment
IR Area	64	BOOL, INT, UINT	Y	Y	
HR Area	65	BOOL, INT, DINT, REAL, UINT, UDINT, STRING	Y	Y	
AR Area	66	BOOL, INT, UINT	Y	Y	
TIM/CNT	68	BOOL	Y	Y	
EM Area	73	BOOL, INT, DINT, REAL, UINT, UDINT, STRING	Y	Y	
DM Area	70	BOOL, INT, DINT, REAL, UINT, UDINT, STRING	Y	Y	
CIO Area	71	BOOL, INT, DINT, REAL, UINT, UDINT, STRING	Y	Y	
WORK Area	72	BOOL, INT, DINT, REAL, UINT, UDINT, STRING	Y	Y	

## 2.7 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.

## EXAMPLES FOR ALL POSSIBLE IEC DATA TYPES

PLC	zenon
I16	INT
I32	DINT
U16	UINT
U32	UDINT
REAL	REAL
Boolean	BOOL

**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.

## 2.8 Driver-specific functions

This driver supports the following functions:

### INI ENTRIES

#### ZENON6.INI

Blockwrite

With an entry in the `zenon.ini`, block write can be activated. To activate it the entry `BLOCKWRITE=1` has to be set in the section `[OMR_FINS]`.

#### PROJECT.INI

Serial logging

To activate this option a `project.ini` entry has to be added in the section `[RS232LOG]` and the entry `LOGCOMx=0` or `1` has to be set below. `X` has to be replaced by the number of the desired interface.



0 switches logging off, 1 switches logging on. If logging is switched on, a file LOG\_COMxxx.TXT is generated in the directory of the driver. X is replaced by the number of the defined interface.

Examples for the activation of logging for COM 1:

```
[RS232LOG]
```

```
LOGCOM1=1
```



### Info

*We recommend activating logging only for a short time, when problems occur. Active logging needs considerable computer performance. Additionally the log file needs a lot of memory within short time.*

## ERROR FILE

The driver supports the common error files, with zenon 6.20 or higher a central logging is possible.

## EXTENDED ERROR FILE

The driver does not support extended logging.

## SERIAL LOGGING

In order to activate this option a section RS232LOG has to be added to the project.ini. Here

the entry LOGCOMx=0 or 1 has to be set. X has to be replaced by the number of the desired interface. With o

0 switches logging off, 1 switches logging on. If logging is switched on, a file LOG\_COMxxx.TXT is generated in the directory of the driver. X is replaced by the number of the defined interface.

Examples for the activation of logging for COM 1:

```
[RS232LOG]
```

```
LOGCOM1=1
```

We recommend activating logging only for a short time, when problems occur. Active logging needs considerable computer performance. Additionally the log file needs a lot of memory within short time.

**BLOCKWRITE**

With an entry in the zenon.ini, block write can be activated. To activate it the entry BLOCKWRITE=1 has to be set in the section [OMR\_FINS].

**REDUNDANCY**

Yes

**RDA**

-

**REAL TIME STAMPING**

No

**BROWSING**

Is not supported by the driver.

**ERROR TIMEOUT**

No settings possible.

**ACCESS METHODS****POLLING**

Cyclical query of the variable, driver.

**SPONTANEOUS**

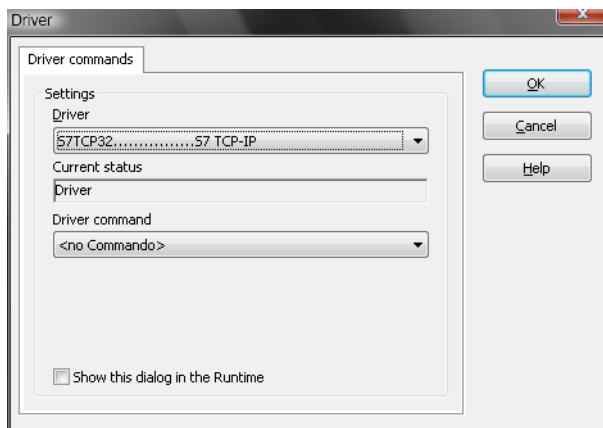
-

## 2.9 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



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.
<b>Driver commands</b>	Drop-down list for the selection of the command.
▶ Start driver (online mode)	Driver is reinitialized and started.
▶ Stop driver (offline mode)	Driver is stopped. No new data is accepted.  <b>Note:</b> If the driver is in offline mode, all variables that were created for this driver receive the status <code>switched off</code> (OFF; Bit 20).
▶ Driver in simulation mode	Driver is set into simulation mode. The values of all variables of the driver are simulated by the driver. No values from the connected hardware (e.g. PLC, bus

	system, ...) are displayed.
▶ Driver in hardware mode	Driver is set into hardware mode. For the variables of the driver the values from the connected hardware (e.g. PLC, bus system, ...) are displayed.
▶ Driver-specific command	Enter driver-specific commands. Opens input field in order to enter a command.
▶ 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)
Show this dialog in the Runtime	The dialog is shown in Runtime so that changes can be made.

## DRIVER COMMANDS IN THE NETWORK

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

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

### 2.10 Test

#### TESTED WITH THE FOLLOWING HARDWARE AND SOFTWARE

omron SYSMAC CJ1M /CPU11 (Programmable Controller)

## TESTING ENVIRONMENT

Tested with serial interface (serial cable, no null modem cable, cable type: SYSMAC WAY), Parameter: 9600, 7, 2, even, no and TCP/IP connection with default port 9600. The IP-Address of the PLC can be set via Web-interface eg: . [http://\[IP-Address of the PLC\]\0](http://[IP-Address of the PLC]\0) or via the DM memory area with serial connection (Offset:  $m = D30000 + (100 \times \text{unit number}) + 98$ ; in these 4 Bytes, the IP-Adresse is entered, which will be used by the PLC).

For details, please check the Omron Documentation 'W441E101\_Ethernet+CPUs\_Operation\_Manual.pdf'.

## LIMITATIONS

In our test, writing on HR and AR was impossible. With the driver object type IR neither write nor read was possible.

## 2.11 Error analysis

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

### 2.11.1 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.*

## 2.11.2 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.



### Info

*Refer to the FINS documentation section 5-1-3 „End Codes“ for an explanation of the error numbers. Here all error numbers are documented.*

## 2.11.3 Check list

- ▶ If the PLC is connected correctly (serial connection cable – no null modem cable with serial connection) and the connection has been configured correct 9600,7,2,even,no)?
- ▶ Is the IP address of the PLC configured correctly (with connection via TCP/IP)? Can the PLC be contacted via the Web interface or with e.g. ping in the driver configuration/Conn. TCP/IP?
- ▶ Did you analyze the error file (up to zenon version 6.01) or the central log file (version zenon 6.20 and higher)?