

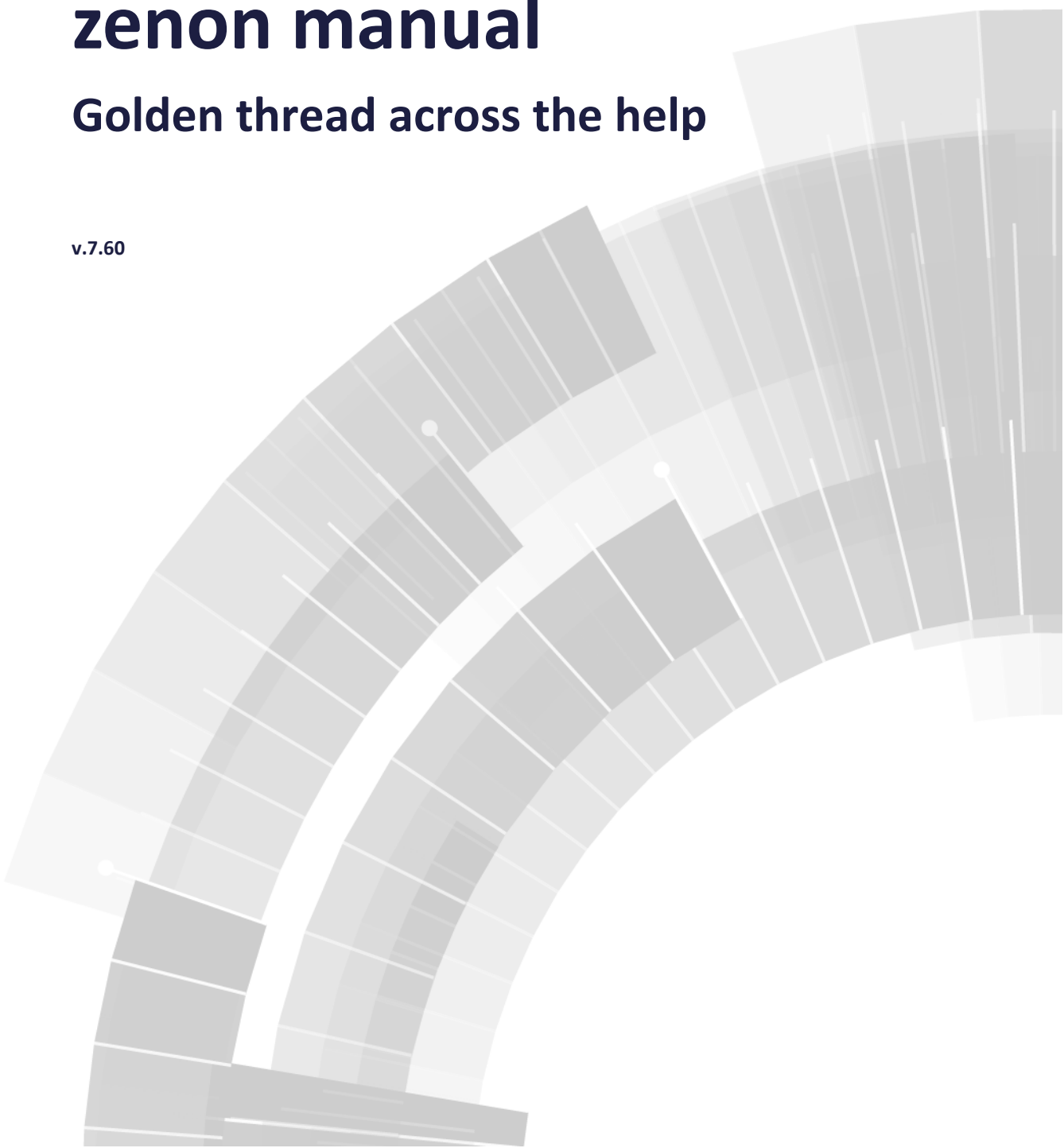


COPADATA
do it your way

zenon manual

Golden thread across the help

v.7.60





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1. Welcome to COPA-DATA help

ZENON VIDEO-TUTORIALS

You can find practical examples for project configuration with zenon in our YouTube channel (https://www.copadata.com/tutorial_menu). The tutorials are grouped according to topics and give an initial insight into working with different zenon modules. All tutorials are available in English.

GENERAL HELP

If you cannot find any information you require in this help chapter or can think of anything that you would like added, please send an email to documentation@copadata.com (<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. Golden thread through the help - an overview

The more powerful the control system, the more voluminous the according help.

In difference to all the other chapters, where features and functionalities are explained, this chapter should help you to find your way through our help.

3. Which help chapters for the start



Information

This chapter is designed for all those, who use zenon for the first time and wonder which help topics are useful for the beginning. Here you will learn about the steps needed for a simple basic project. The according information from the tutorials and the manual are linked to the according steps.

3.1 The Editor

ZENON:

zenon consists of two parts:

1. Editor

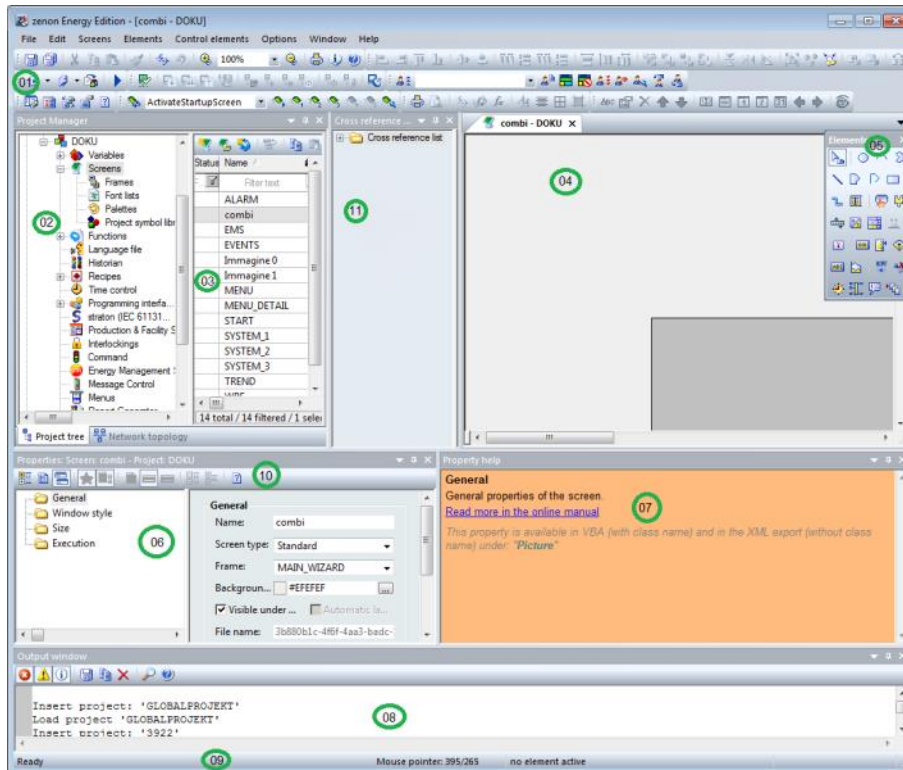
(operating system): Here the projects are created.

2. Runtime

: There the created equipment can be monitored and operated.

STRUCTURE OF THE EDITOR:

The Editor's user interface consists of different areas:



Element	Contents
01 - Toolbars:	<p>A collection of Toolbars for the Editor and its modules. They are available for:</p> <ul style="list-style-type: none"> ▶ Dockable windows ▶ Alignment ▶ Screens / Symbols ▶ Editor profiles ▶ Elements ▶ Menu bar ▶ Production & Facility Scheduler ▶ Remote Transport ▶ Report Generator ▶ Runtime Files ▶ Visibility levels ▶ VBA macros
02 - Project Manager:	Tree view of the Project Manager.
03 - Detail view of the Project Manager:	Details for the module selected in the Project Manager.
04 - Main window:	Main work space; here documents such as screens or reports are displayed.
05 - Toolbar elements:	Toolbar for screen elements - vector elements and dynamic elements.
06 - Properties	Displays the properties of a selected object. Three modes are available and can be selected from the Properties toolbar.
07 - Properties help:	Displays short help messages for properties of screens, variables, functions and other elements which can be engineered.
08 - Output window	Messages are displayed here if projects are compiled and sent to Runtime.
09 - Status bar:	Shows status information for Editor readiness and screens.
10 - Toolbar properties:	Defines display and sorting options of the properties, shows Properties help.
11 - Cross-reference list:	

You choose which windows are shown:

- ▶ in the **Drop-down list** under **Options** or

The arrangement of the windows can be adjusted individually. Just the main window cannot be hidden.

THE NEXT STEP:

You can find information on creating a project in the Creating a project (on page 8) chapter.

3.2 Creating a project

CREATING THE WORKSPACE:

The workspace is the basis for one or more projects.
How to create a new `workspace` is described in the Tutorial Basic.

CREATING A PROJECT:

Then a new **project** is created in the workspace. A project is a self-contained and executable entity of engineering elements (e.g. screens, variables, functions, etc).

You can find more information on creating a project in the Basic Tutorial (Main.chm::/T_Basic.chm::/T_Basic_Ein_neues_Projekt_Erstellen_eines_neuen_Projekts.htm).

**Information**

Now you are able to create a project.

THE NEXT STEP:

To add screens to your projects, see Screens and templates (on page 8) in the next chapter.

3.3 Frames and screens

CREATING A FRAME:

Frames define the screen area, in which the screens are opened then. Each screen is based on a frame. You will find more information on creating frames in the Tutorial Basic and in the chapter Frames.

CREATING A SCREEN:

zenon offers different pre-defined screen types, so also the simplest "Standard", where a screen area can freely be defined. For the graphical design of the screens there are hardly any limitations. Simply select the pre-defined screen elements to display your equipment schematically in the screen.

EXTENDING THE SCREEN WITH SCREEN ELEMENTS:

zenon offers pre-defined vector and dynamic screen elements, which can be linked with functions or variables.

You will find more information on the picture elements in the Basic Tutorial; the different shapes of the pre-defined screen elements are described in detail in the Screen elements chapter.

Another possibility to save time in the engineering phase are pre-defined symbols, which you will find in the symbol library. You will find more information on symbols in the chapter Symbols and Element groups.



Information

You now can create a new project with screens and screen elements.

THE NEXT STEP:

Drivers and variables are needed in order for your screen elements to show "genuine" values and for your equipment to be observable via zenon. You can find further information on this in the Drivers and variables (on page 9) chapter.

3.4 Drivers and variables

SELECTION OF A DRIVER

Variables are based on drivers, so a Driver has to be selected first. During the engineering phase usually one of the simulation drivers is used. Later it is replaced by the driver for the according PLC. As an open and independent system, zenon already supports more than 250 communication protocols and drivers. You can find detailed information on the individual drivers in the corresponding driver documentation. You can find these in the online help in the **Driver** section.

CREATING A VARIABLE

Variables are the interface to the process data and represent certain measurement values or status. In order to make aware of critical events in your process, limit values can be defined for variables. You will find more information on creating a variable in the Tutorial Basic. You will find an extensive description of variables datatypes and reaction matrices in the chapter Variable definition and process data model.

DISPLAYING VALUES IN SCREEN ELEMENTS

Screen elements can be linked to variables in order to display incoming values. You will find more information on linking variables with dynamic screen elements in the Tutorial Basic. In the chapter Screen elements you will find a link to the dynamic - and vector screen elements of zenon.



Information

You now have an insight on how to use variables and drivers.

THE NEXT STEP

You not only want to monitor but also operate? Functions have to be created and linked to be able to operate zenon.

You can find information on this in the Functions (on page 10) chapter.

3.5 Functions

CREATING A FUNCTION:

Functions are the basis for operating the equipment in the Runtime. For example, they allow you to switch between the individual process screens or to change values.

Several functions can be combined and administered in a script. You will find more information on scripts in the chapter Scripts.

LINKING A FUNCTION TO A DYNAMIC SCREEN ELEMENT:

You will find more information in the Basic tutorial. As zenon offers a great variety of different functions, they are listed and explained in the chapter Functions overview. Additionally you will find a short description in the dialog **Function new**.



Information

Now you are able to create a simple project. You can create a screen, link variables and functions to screen elements and also display limit value violations.

THE NEXT STEP:

To see your result in Runtime, see the Starting Runtime (on page 11) chapter.

3.6 Starting the Runtime

FROM THE EDITOR TO THE RUNTIME

What has been engineered in the Editor, can be monitored and operated in the **Runtime**. So we leave the development environment (Editor) and start the Runtime.

You will find more information on starting the Runtime in the Tutorial Basic and in the chapter Runtime.



Information

Now you can design your projects and then monitor and operate your equipment.

MORE?

This of course was only a short glimpse on the possibilities offered by zenon. To find out more, see further possibilities (on page 11).

3.7 Extended Possibilities

Here you can find numerous possibilities that you can implement with zenon:

You want to ...	No problem!
... call attention to critical process events (limit value violations)?	Alarm configuration
... analyze alarms?	Industrial Performance Analyzer
... log process and system events?	Chronological Event List
... log changes in the project?	History of Changes
... record and concentrate process data?	Historian
... color and dynamize lines?	Automatic Line Coloring
... create a FDA conform user administration (password system)?	User administration
... analyze log files?	Diagnosis Viewer
... display values from the process as curves?	Extended Trend
... administer maintenance data of machines?	Industrial Maintenance Manager
... send message?	Message Control
... create a client/server network?	Network
Development environment	Editor
Import or export parts of the project?	Import/Export
... execute actions at a defined time?	Production & Facility Scheduler
... create reports?	Report Generator
... create parameter lists for set values and commands?	Recipes
... define a function sequence?	Script administration
... execute functions at a defined time?	Time Control
... switch the language of the text information displayed in the Runtime?	Language switch
... control the access to certain zenon objects in Runtime with the help of variables?	Interlockings
... program cyclic tasks?	Process Control Engine
... getting to know the integration of zenon Logic?	zenon Logic Workbench
Data exchange on ERP level?	SAP Interface

4. Online updating of the zenon Help:

The **Documentation Download Tool** administers the updating of your online help including embedded help, dialog help, tooltips and the PDF product documentation from zenon and zenon Logic.

The updating is carried out online. An internet connection is necessary for this.

CONTENTS OF THE DOCUMENTATION UPDATE:

The **Documentation Download Tool** supports the updates of:

- ▶ zenon and zenon Logic product documentation
- ▶ Driver Documentation
- ▶ Tutorials
- ▶ Glossary

FILE FORMATS OF THE DOCUMENTATION UPDATE:

The **Documentation Download Tool** supports the updates of:

- ▶ Online help for zenon and zenon Logic (.chm)
- ▶ zenon product documentation (.pdf)

Note: The tool is only available in English



License information

Part of the standard license of the Editor and Runtime.

5. Guideline through the help

Here you will find an overview over the chapters of the online manual and a short introduction in the terminology of zenon. You can find notes on efficient project configuration in the **Configure projects efficiently with zenon** manual.

Parameters	Description
Alarm configuration	Critical process events Alarming is used within the overall system to draw attention to critical process events and to support the user in localizing and eliminating them.
History of changes	Documentation of the engineering, Audit trail The history of changes serves for complete documentation of the phase of engineering. The changes (e.g. change, delete, create) that are made can be logged.
Equipment Modeling	Depicts the structure and equipment and makes it possible to correctly assign details to the lower level (such as machines, recipes and processes) and to see the relationship. Complies with the standards ISA S88 and S95.
Historian	Recording process data The objective of archiving is the recording and free multi-stage summarizing (average, total, maximum or minimum) of the process data in connection with a flexible and user-friendly editing level conforming to the system.
Automatic Line Coloring	Topological coloring of lines (the automatic coloring of lines) allows easy automatic dynamizing of tubes in technology (for media) as well as in the energy distribution (for electricity).
Batch Control	The module Batch Control offers the possibility to automate batch-orientated manufacturing processes for lot products.
User Administration	zenon password system supports user administration for the editor (chapter Project) and for online operation (Runtime). With its password system it supports the requirements of the FDA (Food and Drug Administration, Part 11).
Screens	The main element of a project is the screens which are to provide the operator with the most comprehensive level of information about the plants that are operated.
Chronological Event List	Operation journal, Audit trail, all process and system events as well as user inputs can be logged in the Chronological Event List.
Controls	Integration for your own .NET user controls, ActiveX and WPF elements. Offers possibilities to access the zenon API.
Diagnosis Viewer	Reporting Tool Allows the reading of existing zenon log files, online logging, saving of the current view, parameterizing the Diagnosis Client and the Diagnosis Server.

Dynamic screen elements and Vector screen elements	Vector and dynamic elements zenon offers two different types of screen elements: Vector and dynamic screen elements. All elements can be dynamized.
Editor	project environment The control system consists of Editor and Runtime: The development environment, the Editor, and the online display, the Runtime. Projects are created in the Editor, operation and monitoring is done in the Runtime. Detailed description of the zenon engineering system, the Editor.
Energy Edition	A package with special functions for energy and process technology (such as Automatic Line Coloring).
Extended Trend	Display of values as curves The extended trend serves for the representation of the online (HD management) and historical values (archive values) of process variables and derived process variables.
Functions (on page 10)	Predefined macros which can be easily used and parameterized by engineers and that can serve for modifications in zenon User modifications in zenon are implemented via user-defined project functions. All functions used in a project are based on the existing system functions.
HTML	Display as HTML pages The use of a screen for the display of HTML pages offers all the possibilities of the Microsoft Internet Explorer.
Import/Export	Parts of a project can be imported to zenon or exported from zenon. The format of the export file is *.XML.
Industrial Maintenance Manager	Administration of maintenance data The Industrial Maintenance Manager helps administer machine and maintenance data. Service intervals can comfortably be planned and administered. You can see at a glance which device, equipment, machine, etc. has to be maintained today / this week / next month etc. Additionally

	service work done in the past is logged.
Industrial Performance Analyzer	Alarm evaluation The Industrial Performance Analyzer locates and minimizes weak points (downtimes) of equipment.
Installation and updates	Information for the installation of zenon on different operating systems (such as Windows CE, .. Embedded, etc.)
Keyblock Runtime Start	A program that starts zenon Runtime and blocks all Windows system keys. Users work in zenon Runtime and have no access to the operating system level.
Keyboards	Virtual keyboard Using a screen of the keyboard screen type allows you to create a freely definable virtual keyboard.
Configuration files	Information for system administrators, who directly want to edit the INI files.
Load Management	For implementation of energy supply management for small and medium-sized power supply companies and also for industrial firms whose energy supply is arranged by special contracts. Can be used for both forecasting and optimization.
Licensing	To be able to use the zenon Editor or Runtime, the product must be licensed. zenon runs in Demo Mode until it has been licensed.
Measuring unit switch	Enables conversion and switching of base units into conversion units, for example meters into yards or meters into decimeters, centimeters and millimeters. For the conversion units, a factor, an offset and a shift of the decimal point can be defined for conversion units, based in the relevant base unit.
Menu administration	The menu editor allows creating Windows compliant menus.
Message Control	Sending of messages via SMS, voice message or email The task of this module is to send messages to different recipients.

Mobile applications for zenon	With the mobile applications, you can visualize your zenon projects on mobile end devices, tablets and desktop computers.
Monitor configuration	Multiple monitor system With the zenon monitor administration of the control system you can define for each workplace if the target system of the project is equipped with one or multiple monitors.
Multi-Touch	With zenon, touch screens can also be operated with Multi-Touch gestures. Multi-Touch gestures for zooming and scrolling are suitable for navigation on touch panels in the worldview.
Network	Client/server model The control system works as a client/server system or as a multi-hierarchical system with substations, main stations and headquarters in network environment.
Notepad	Output of logs and text files.
OPC server	The OPC server makes the variables of the project available for standard OPC client tools.
PLC Diagnosis	With the PLC Diagnosis program details of a PLC can be displayed directly in a screen of the control system. Depending on the PLC different functionalities are available. At the moment, there is the Simatic S7 Graph step chain analysis for the display of step chain information of S7 PLCs and the zenon Logic Monitoring Viewer for the display of all programs being executed in the zenon Logic Runtime.
Process Gateway	The Process Gateway serves as a coupling to higher-level systems. Parts of the zenon process image of other applications can be made available and be updated.
Production & Facility Scheduler	Schedules, switching clocks The Production & Facility Scheduler (PFS) allows executing actions (e.g. changing of a variable's set value, executing a function) for a period of time or in a time grid.
Programming Interfaces	zenon provides different interfaces such as VBA, VSTA or .Net to include your own programs or to automate project configuration.

Project conversion	Information on compatibility, including instructions for the correct conversion of older zenon versions.
Project Backup	Back up and restore existing projects. Project backups can then be restored to the same or another computer. Project backups can also be versioned.
Project simulation	Offers the possibility to switch between simulation mode and hardware mode. In simulation mode, switching actions are executed, recipes are sent, set values are defined etc. without these operations actually being sent to the process (such as to a control unit for example).
Project manager	Information on project creation, project administration Back up and restore projects, global projects, configuration, Remote Transport
Process data model and variable definition	Variables are the interface between the data source (PLC, field bus, etc.) and zenon. Variables, data types, drivers, reaction matrices
Cross-reference list	Project overview The Cross Reference List serves to generate a project overview in table format. For example, it is possible to see which variables are used in what screens in the Cross Reference List.
Remote Transport	The Remote Transport is used to transport Runtime files to a target system. This ensures that all necessary files are transferred to the target system. Other functions (such as incremental copying, transferring of status) are available.
Reporting with the Report Generator and	documentation, evaluation and presentation of process data on the basis of online and archive data from zenon. Reporting is divided into: <ul style="list-style-type: none"> ▶ Report Generator ▶ Report Viewer
Recipes	Input lists for set values and commands Recipes serve for the assembling of input lists for setpoint values and commands, which are executed with a function call in online operation.
Recipegroup Manager	In addition to the standard recipes, the Recipegroup Manager offers more functionalities, such as free layout, free grouping.

Runtime	<p>Online operation, Runtime</p> <p>The control system consists of Editor and Runtime: The development environment, the Editor, and the online display, the Runtime. Projects are created in the Editor, operation and monitoring is done in the Runtime.</p> <p>Online operation in the Runtime</p>
Runtime help	zenon offers the possibility to create a context-sensitive help for projects running in the Runtime.
SAP Interface	<p>zenon and SAP communicate using a two-way interface.</p> <p>The control system sends messages for any desired processes to the SAP application (such as monitoring stock in real time).</p>
Command Sequencer	Commands from the Command Processing module can be compiled into processes in Runtime and visualized. User interactions can also be executed.
Scheduler	<p>Time-triggered function calls</p> <p>The Scheduler is loaded, if the module PFS is not licensed. Its functionality is similar to the PFS, but the functional range is limited. The Scheduler allows the automatic execution of actions at a defined time.</p>
Fonts	Fonts existing in the operating system can be used in zenon.
Script administration	<p>Function sequence</p> <p>If several user defined functions should be connected in a sequence, they must be combined into a script.</p>
Language switch	Allows the language of text information to be switched between different languages in the Runtime.
Status processing	<p>Attribute for variables</p> <p>It is possible to issue a status for each variable with status processing. A total of 64 status bits are defined. The most common are spontaneous, invalid, manual value and replacement value.</p>
Styles	<p>Styles make it possible to extract graphics properties from screen elements in the Editor, to administer these and to apply these to other elements.</p> <p>They are always administered in the global object.</p>

zenon Logic Runtime	The zenon Logic Runtime interprets the compiled code (PLC code) of the zenon Logic Workbench. The Runtime runs on Windows 7/8 and 7 Embedded PCs, as well as Windows CE platforms.
zenon Logic Workbench	zenon Logic is an IEC 61131-3 programming environment. With zenon Logic development environment - the Workbench - PLCs can be engineered and programmed in the five defined languages of IEC 61131-3.
Driver simulation	If the underlying process is not available when configuring, this can be simulated and tested in advance.
Tools	<p>A range of tools support you for the management, analysis and configuration of zenon:</p> <ul style="list-style-type: none"> ▶ Diagnosis Viewer: Allows zenon LOG files to be read and configured. ▶ Keyblock Runtime Start: Starts zenon Runtime and at the same time blocks all Windows system keys. ▶ Online updating of the zenon Help (on page 13): Allows online updating of zenon Help. ▶ Project Translation Interface: Tool for the translation of zenon language files. Opens or saves data for the zenon Language Translation Wizard. With this, projects can be imported into or exported out of zenon. ▶ Startup Tool: Makes it possible to start the Editor and Runtime with certain parameters, to administer different zenon versions on one computer, to administer SQL instances and to define languages for Editor and Runtime. ▶ System Information Collector: Reads system information and zenon information, displays it in an output window and saves it as a ZIP file. <p>The following are available for zenon Logic:</p> <ul style="list-style-type: none"> ▶ zenon Logic Runtime Manager: Administer all stand-alone/manual-start zenon Logic Runtime projects on your computer. The documentation for this tool is part of the zenon Logic documentation.

Variables	Variables, also called process variables or data points, are the interface between the data source (PLC, field bus, etc.) and zenon. They represent certain measured values or states of the hardware, including properties such as scaling, limit values, etc.
Interlockings	Access authorizations Interlockings control the access to certain zenon objects during Runtime via variables.
Distributed engineering	Multi-user administration, distributed engineering The zenon distributed engineering functionality makes it possible for multiple users to work on the same project at the same time.
Video (Main.chm::/H_Video.chm::/H_Video.htm)	.avi files in zenon Online and saved video recordings (*.avi) can be replayed by using a screen for playing videos.
Worldview	Scrolling on large screens. By using the "Worldview overview" screen type, it is possible to scroll in standard screens that are larger than the screen resolution. Here it is also possible to zoom and depending on the zoom steps to show and hide detail information in the screen. (Zooming, panning, decluttering).
Wizards	Assistants for project support In order to be able to handle recurring tasks in the project configuration phase easily and quickly, zenon offers wizards for different tasks. Users can create wizards for individual tasks.
Time Control	In the time control, you can define all function calls that should be executed at a defined time or cyclically.
zenon Remote Desktop	With the zenon Remote Desktop, a remote desktop connection to a remote target system is established in order to administrate a remote computer easily. You will see the desktop exactly as it looks on the target system. The zenon Remote Desktop offers two connection types: one for "watching only" and one for "operating" the remote system.
zenon Science Package	The zenon Science Package makes it possible to program LEGO Mindstorms NXT 2.0 / EV 3.0. Programs are created in zenon Logic and executed on the LEGO Controller with zenon Logic, an IEC 61131-3 programming environment integrated into

	zenon.
zenon Web Server and zenon Web Server Pro	<p>The zenon Web Server gets projects onto the internet or intranet in exactly the same form. For the transfer no project adaptations are required. Contrary to the zenon Web Server Pro, the zenon Web Server only offers viewing functionality.</p> <p>The zenon Web Server Pro offers complete viewing and operating functionality. It is possible to directly engage in processes over the web.</p>
zenon for Windows CE	<p>The zenon CE Runtime can run on different CE hardware platforms. Generally, the CE version of zenon offers the same functionalities as the PC version of zenon, however with some limitations which result from the lower hardware resources.</p>
Allocations	<p>Value transfer</p> <p>The routing of the current value of a process variable to a second variable within a driver or across drivers is implemented with the use of allocations.</p>

6. Functionality of the online help - So I find, what I need

It sometimes happens, that information is documented in the online help, but cannot be found with the search functionality.

So you here find a short introduction, how you can successfully search and most of all find information in our online help.

SEARCH STRATEGIES

- ▶ As a default help starts on tab **Contents**. Here you will find the entire documentation (online manual, tutorials, and driver documentation) in a tree structure.
- ▶ Tab **Search** allows searching for certain terms by entering them in the search field.
- ▶ You can save your favorite help chapters in the **Favorites** tab. Simply switch to the desired chapter in the **Contents** tab or find it with **Search** (double-click it) and then switch to **Favorites**. The selected help chapter will now be proposed under **Current topic** and can be added to the favorites.

Searching for words and phrases:

Parameters	Description
Single word	e.g. alarm Chapters containing the word "alarm" are listed. The grammatical variations of this word are also searched for.
Phrase	e.g. "alarm administration" Chapters are searched for the complete phrase "alarm administration". Without quotation marks chapters containing both words alarm AND administration (but not necessarily together) would be found.
Extensions	e.g. alarm* Chapters are searched for words starting with "alarm". The asterisk (*) can also be in front of the word to be searched for (e.g. *alarm)
Replace	AND Both words should appear in the same chapter. e.g. Alarm AND CEL Chapters that contain both words are displayed.
	OR At least one of the words should appear in the chapter. e.g. Alarm OR CEL Chapters containing either the word "alarm" or the word "CEL" or both are listed.
	NOT Only one of the words in the chapter e.g. Alarm NOT CEL Chapters containing the word "alarm" but not the word "CEL" are listed.
	NEAR Both words in the same chapter, near to each other e.g. alarm NEAR CEL Chapters containing both words "alarm" and "CEL" with a maximum distance of eight words.