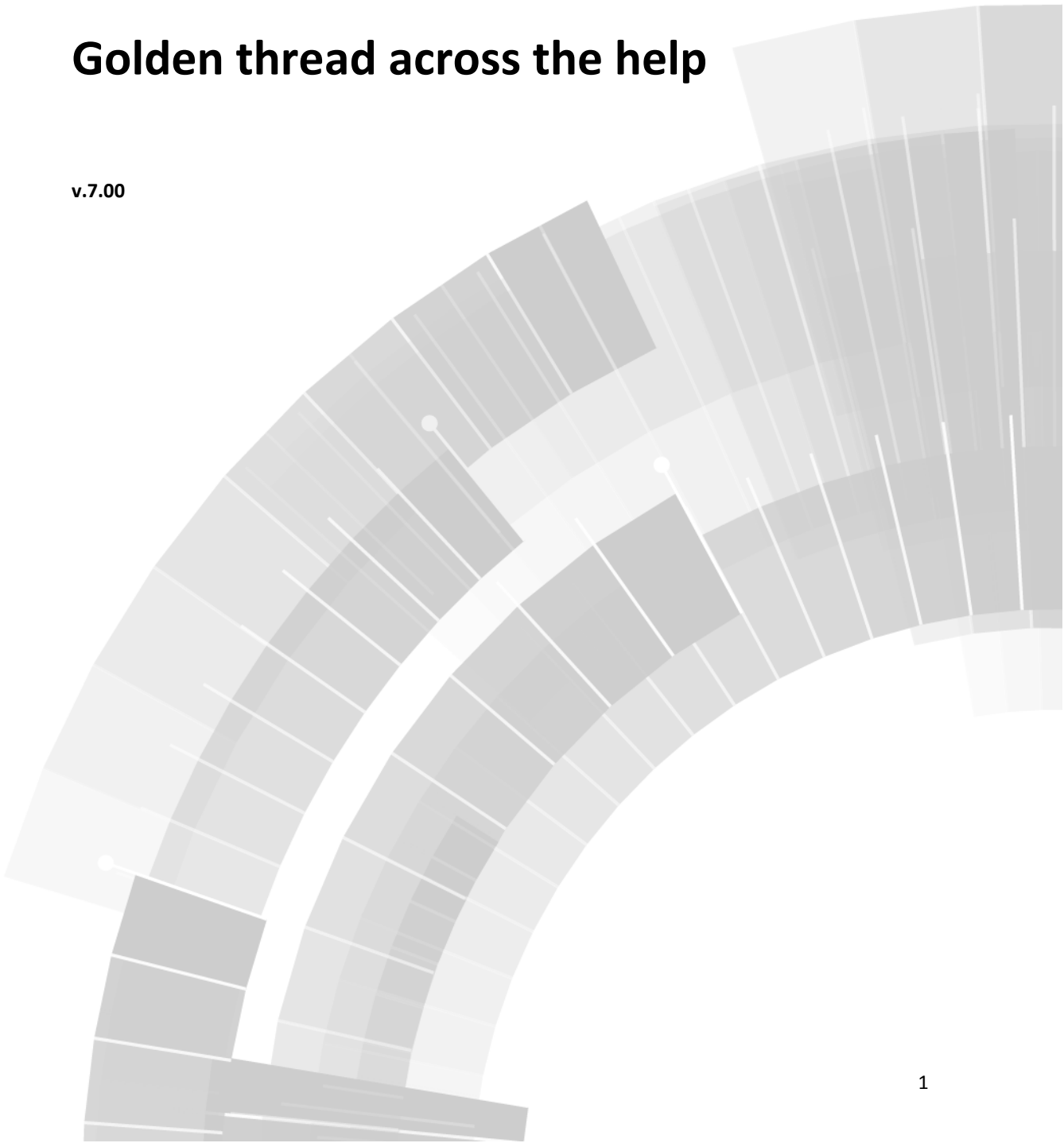
COPA-DATA
do it your way

zenon manual

Golden thread across the help

v.7.00



Contents

1. Welcome to COPA-DATA help

GENERAL HELP

If you miss any information in this help chapter or have any suggestions for additions, please feel free to contact us via e-mail: documentation@copadata.com (mailto:documentation@copadata.com).

PROJECT SUPPORT

If you have concrete questions relating to your project, please feel free to contact the support team via e-mail: support@copadata.com (mailto:support@copadata.com)

LICENSES AND MODULES

If you realize that you need additional licenses or modules, please feel free to contact the sales team via e-mail: 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

> **Info**
>
> *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:

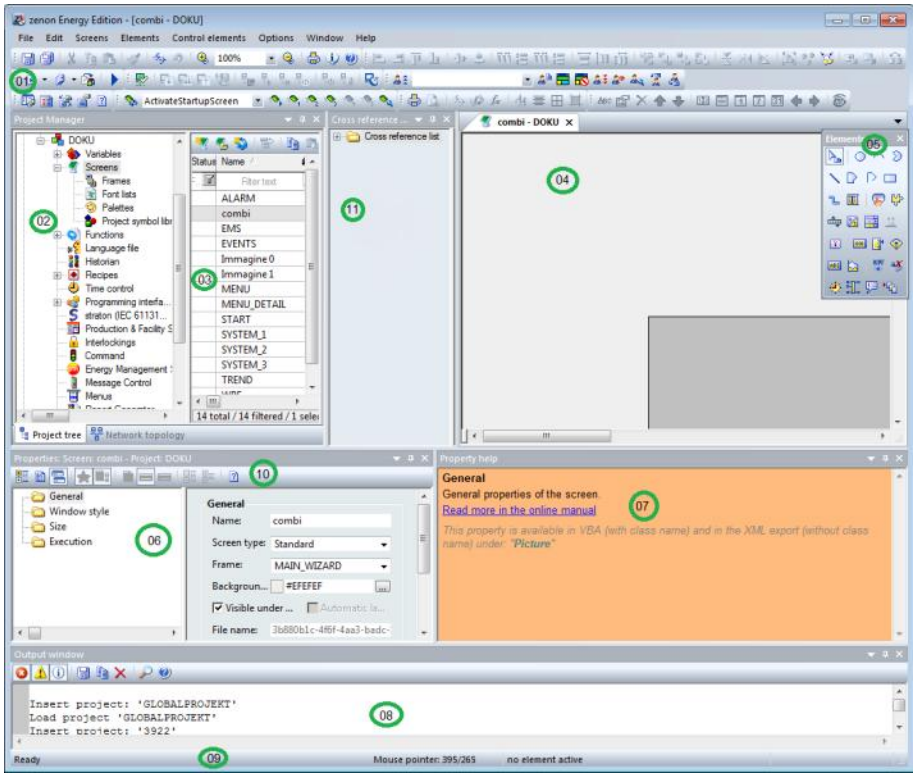
zenon consists of two parts:

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:	A collection of Tool bars for the Editor and its modules. They are available for: ▸ 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 availabe 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 displyed here if projects are compiled and sent to the 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 adjustedindividually. Just the main window cannot be hidden.

THE NEXT STEP:

In order to learn more about creating a project click the link in the box.

See also

Creating a project (on page 8)

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 (Main.chm::/T_Basic.chm::/T_Basic_Ein_neues_Projekt_Erstellen_eines_neuen_Arbeitsbereichs.htm).

CREATING A PROJECT:

Then a new project is created in the workspace. A project is a self-contained and run capable entity of engineering elements (e.g. screens, variables, functions, etc.).
You will find more information on creating a project in the Tutorial Basic Tutorial (Main.chm::/T_Basic.chm::/T_Basic_Ein_neues_Projekt_Erstellen_eines_neuen_Projekts.htm).

Info

Now you are able to create a project.

THE NEXT STEP:

You project should also get screens? Click the link in the box below.

> **See also**
>
> *Frames and screens (on page 9)*

3.3 Frames and screens

CREATING A FRAME:

Frames define the screen area, in which the screens are opened then. Every screen is based on a frame. You will find more information on creating frames in the Tutorial Basic (Main.chm::/T_Basic.chm::/T_Basic_Bilder_und_Funktionen_Schablonen_Schablonen_neu_erstellen.htm) 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 pciture elements in the Tutorial Basic (Main.chm::/T_Basic.chm::/T_Basic_Bilder_und_Funktionen_Bildelemente.htm), the different shapes of the pre-defined screen elements are described in detail in the chapter Screen elements ausführlich beschrieben.
Another possibility to save time in the engineering phase are our pre-defined symbols, which you will find in the symbol library. You will find more information on symbols in the chapter Symbols.

Info

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

THE NEXT STEP:

Your screen elements should display "real" values and you want to be able to monitor your equipment in zenon? Click the link in the box below.

See also

Drivers and variables (on page 10)

3.4 Drivers and variables

SELECTION OF A DRIVER

Variables are based on drivers, so a Driver (Main.chm::/T_Basic.chm::/T_Basic_Variablen_Treiber_Treiber_auswählen_und_einstellen.htm) 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. AAs an open and independent system zenon supports more than 250 drivers, you will find information aabout the single drivers in the according driver documentation. You will find it online in the section `Treiber` or on our CD/DVD as PDF files for printing.

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, limits can be defined for variables.
You will find more information on creating a variable in the Tutorial Basic (Main.chm::/T_Basic.chm::/T_Basic_Variablen_Variablen_Einfache_Variable_neu_erstellen.htm). 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 incomming values.
You will find more information on linking variables with dynamic screen elements in the Tutorial Basic (Main.chm::/T_Basic.chm::/T_Basic_Bilder_und_Funktionen_Bildelemente.htm). In the chapterScreen elements you will find a link to the dynamic - and vector screen elements of zenon.

Info

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.

See also

Functions (on page 11)

3.5 Functions

CREATING A FUNCTION:

Functions are the basis, so that equipments can be operated in the Runtime; e.g. switching between screens or setting of 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 (Main.chm::/T_Basic.chm::/T_Basic_Bilder_und_Funktionen_Bildelemente_Funktionen_für_die_Elemente_Funktionsverwaltung.htm). 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`**.

Info

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 violations.

THE NEXT STEP:

Time to see, what has been engineered? Click the link in the box below.

See also

Starting the Runtime (on page 12)

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 (Main.chm::/T_Basic.chm::/T_Basic_Runtime_(Onlinebetrieb)_Runtime_starten.htm) and in the chapter Runtime.

Info

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. You want to know and to learn more? Click the link in the box below.

See also

Extended Possibilities (on page 13)

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 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 (ALC)
... 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/export parts of the project?	Import/Export
... execute actions at a defined time?	Production and 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 (PCE)
... getting to know the integration of zenon Logic?	zenon Logic Workbench
Data exchange on ERP level?	SAP interface

4. Guideline through the help

> **Info**
>
> *Here you will find an overview over the chapters of the online manual and a short introduction in the terminology of zenon.*

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 done are logged.
Historian	Recording process data The objective of archiving is the recording and free multi-stage summarizing (average, total, maximum and/or minimum) of the process data in connection with a flexible and user-friendly editing level conforming to the system.
Automatic Line Coloring (ALC)	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).
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).
Creating screen	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.
File Structure	Information for system administrators, who directly want to edit the ini files. System files, zenon6.ini, project.ini, nbflist.ini, varibales file, dBase import file
Dynamic screen elements/ 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 and operated and monitored in Runtime. Detailed description of the zenon engineering system, the Editor.
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 11)	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. At a glance you will see, 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.
Keyboard	Virtual keyboard Using a screen of the keyboard screen type allows you to create a freely definable virtual keyboard.
List	Logs and text files The list screen displays logs and text files derived from database queries or text files.
Menu administration	The menu editor allows creating Windows compliant menus.

Message Control	Sending messages by SMS, voice message or as an email The role of this module is to send messages to different recipients.
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.
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.
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 Control Engine (PCE)	Programming cyclic tasks The Process Control Engine (PCE) offers the possibility to develop cyclic application flows in VB script or JavaScript. The PCE is especially suitable for long-lasting functions that run in the background (e.g. extensive export functions). Contrary to VBA VB Script supports multi-threading.
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 and Facility Scheduler	Schedule, switching clock The Production & Facility Scheduler (PFS) allows the execution of actions (e.g. changing a variable's set value, executing a function) in relation to a period of time or a time pattern.
Project configuration	Information on project display, project administration Save, 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. E.g. in the Cross Reference List, one can see which variables are used in what screens.
Report Generator	The Report Generator (option) serves for the creation of reports on the basis of online and archive data.
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	Additional to the standard recipes the Recipegroup Manager offers more functionalities, like e.g. free layout, free grouping.
Runtime	Online operation, time running 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 and operated and monitored in Runtime. Online operation in the Runtime
Runtime help	zenon offers the possibility to create a context-sensitive help for projects running in the Runtime.
Scheduler	Time-triggered function calls 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.
Fonts	Fonts existing in the operating system can be used in zenon.
Script administration	Function sequence If several user defined functions should be connected in a sequence, they must be combined into a script.
Language switch	The language change functionality allows to switch the language of text information between different languages in the Runtime. This functionality is essential for the realization of international projects.
Status processing	Attribute for variables With the status administration, it is possible to define your own attributes for each variable. Altogether there are 32

	statuses / attributes. The most common are spontaneous, invalid, manual value and alternate value.
zenon Logic Runtime	The zenon Logic Runtime interprets the compiled code (PLC code) of the zenon Logic Workbench. Runtime runs on Windows XP and Vista and embedded PCs and 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 the IEC 61131-3.
VBA	Extension of zenon You can use VBA in order to extend zenon functionality. The possibilities of VBA in zenon are described in form of examples of special solutions.
Interlockings	Access authorizations Interlockings control the access to certain zenon objects during Runtime via variables.
Distributed engineering	Multi-user administration, multiple workspace ability The zenon multi-user function 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.
What offers zenon under CE?	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.
Web Server and Web Server Pro	The WEB server gets projects to the intranet or internet. For the transfer no project adaptations are required. Contrary to the Web Server Pro, the Web Server only offers viewing functionality. The Web Server Pro offers complete viewing and operating functionality. It is possible to directly engage in processes over the web.
Wizards	Assistants, project support In order to be able to handle recurring tasks in the engineering phase easily and quickly, zenon offers wizards for different tasks. Users can create wizards for individual

	tasks.
World view	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).
Allocations	Value transfer The routing of the current value of a process variable to a second process variable within a driver or across drivers is implemented with the use of allocations.

5. 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 favourite help chapters in the property page **Favourites**. Simply switch to the desired chapter in the property page **Contents** or find it with **Search** (doubleclick it) and then switch to the property page **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)
Links	AND Both words in the same chapterl. e.g. alarm AND CEL Chapters containing both words are listed.
	OR At least one of the word 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 word in the chapter. e.g. alarm NOT CEL Chapters containing the word "alarm" but not the word "CEL" are listed.
	NEAR Both word in the same chapter, near to each other e.g. alarm NEAR CEL Chapters containing both words "alarm" and "CEL" in a maximal distance of eight words.