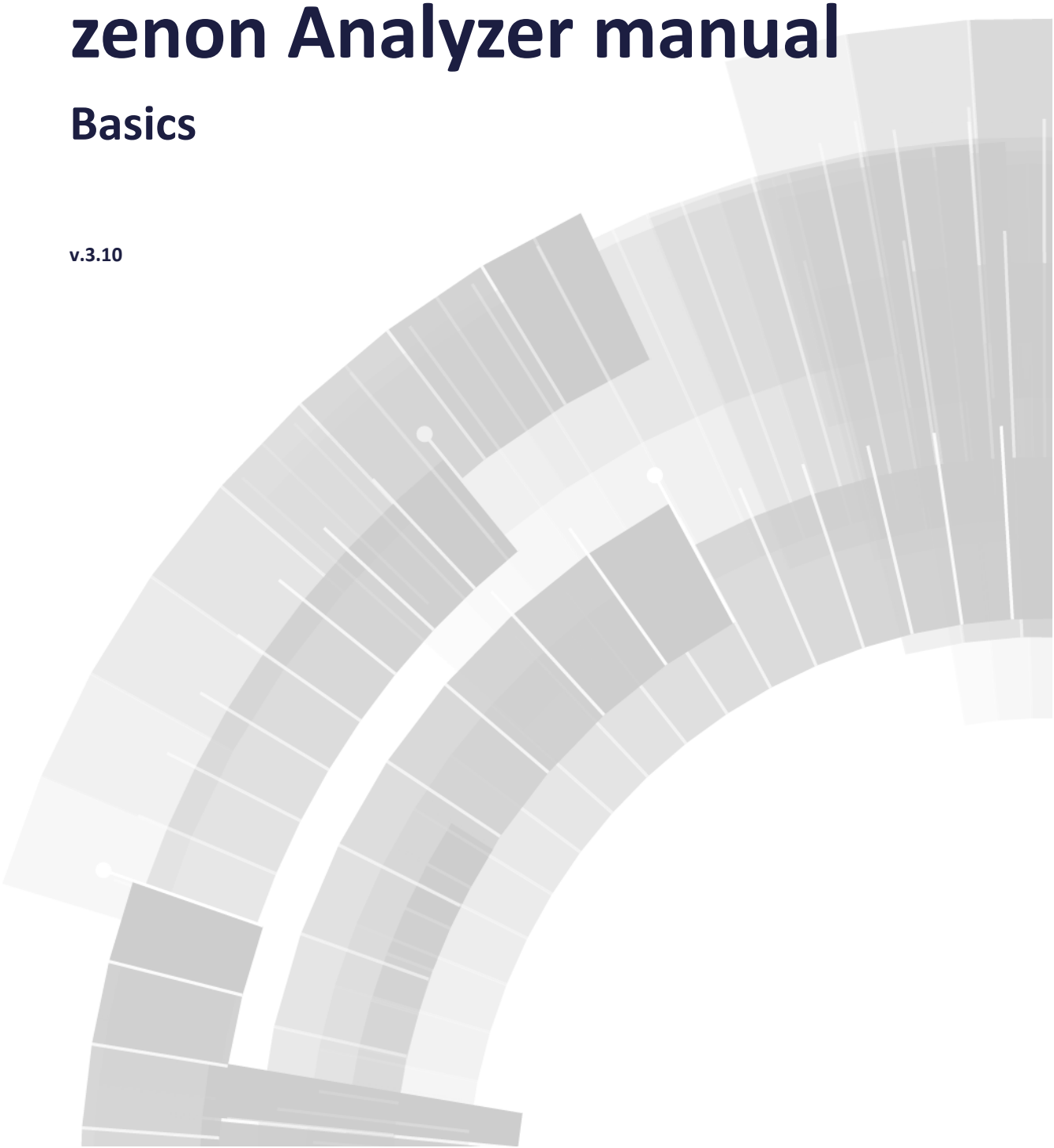
COPA-DATA
do it your way

zenon Analyzer manual

Basics

v.3.10



Contents

1. Welcome to zenon Analyzer help

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).

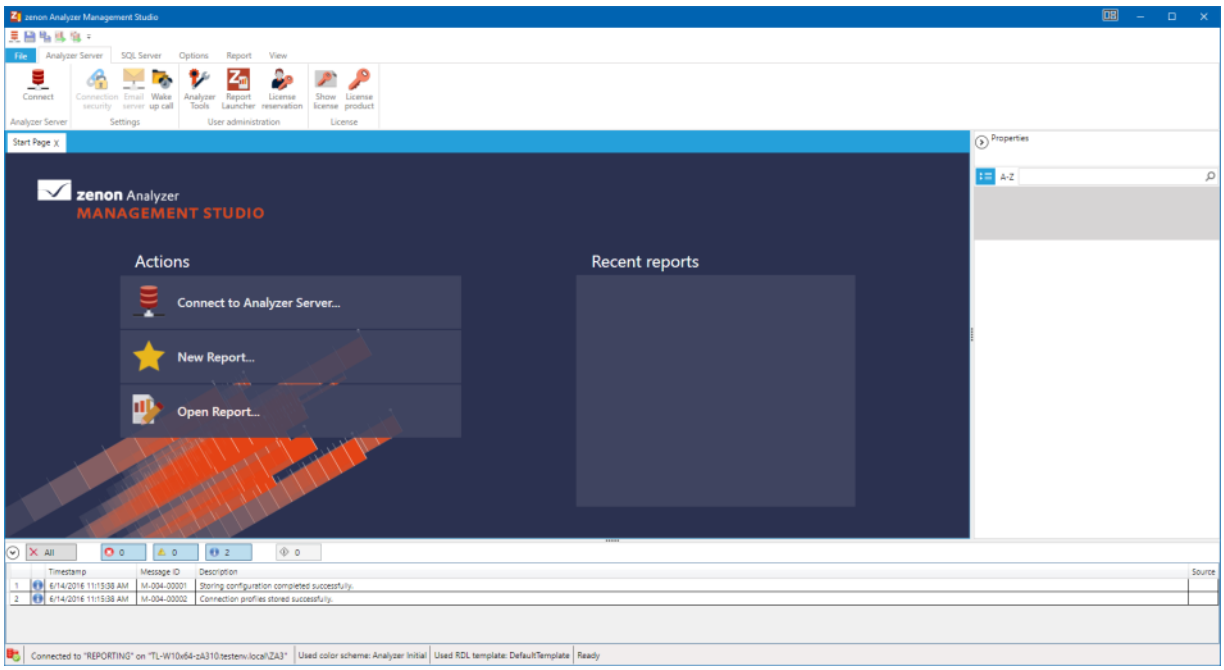
2. Upgrade information

Note when switching to a version prior to version 3.10:

- ZAMS updated (on page 6):
  ZAMS has a new user interface and an amended way of using it. You can now use several report templates as the basis of a report and configure report parameters that were previously pre-defined and fixed.
- Language table: (on page 13)
  The new language table makes it possible for you to edit system key words, as well as your own key words.

3. ZAMS user interface and operation

The user interface of ZAMS has been amended.



The user interface of the ZAMS consists of:

- **Menus, ribbons and tool bars**: Elements that allow access to actions.
- **Main window**: Contains start page and report pages.
- **Properties window**: Contains control elements for the configuration of reports.
- **Output window**: Shows errors, warnings, messages and status messages.
- **Status line**: Shows notices in relation to connections, reports and actions.

RIBBONS

Actions and commands are now selected using a menu and several Ribbons.

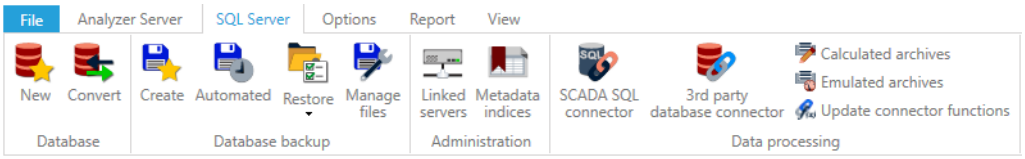
Ribbons consist of:

- **Tab**:
  Allows selection of the Ribbon and contains labeling. If there is too little space for the display of the complete Ribbon available, a standard button is shown. Clicking on this opens a menu with the actions and possibly further standard buttons.
- Ribbon **groups**:
  Subdivides the Ribbon into groups. These contain one or more actions and/or standard buttons.

- **Standard buttons**:
  Shows the presence of submenus.
- **Actions**:
  Allow the configuration and open dialogs.
  Actions are always marked with a short subtitle. A longer description is available via a tooltip.

Ribbons can be hidden or displayed again using the **Minimize ribbon / restore ribbon** in the **Quick access** toolbar. Hiding it is possible by double-clicking on the tab of a Ribbon.

EXAMPLE OF SQL SERVER RIBBON



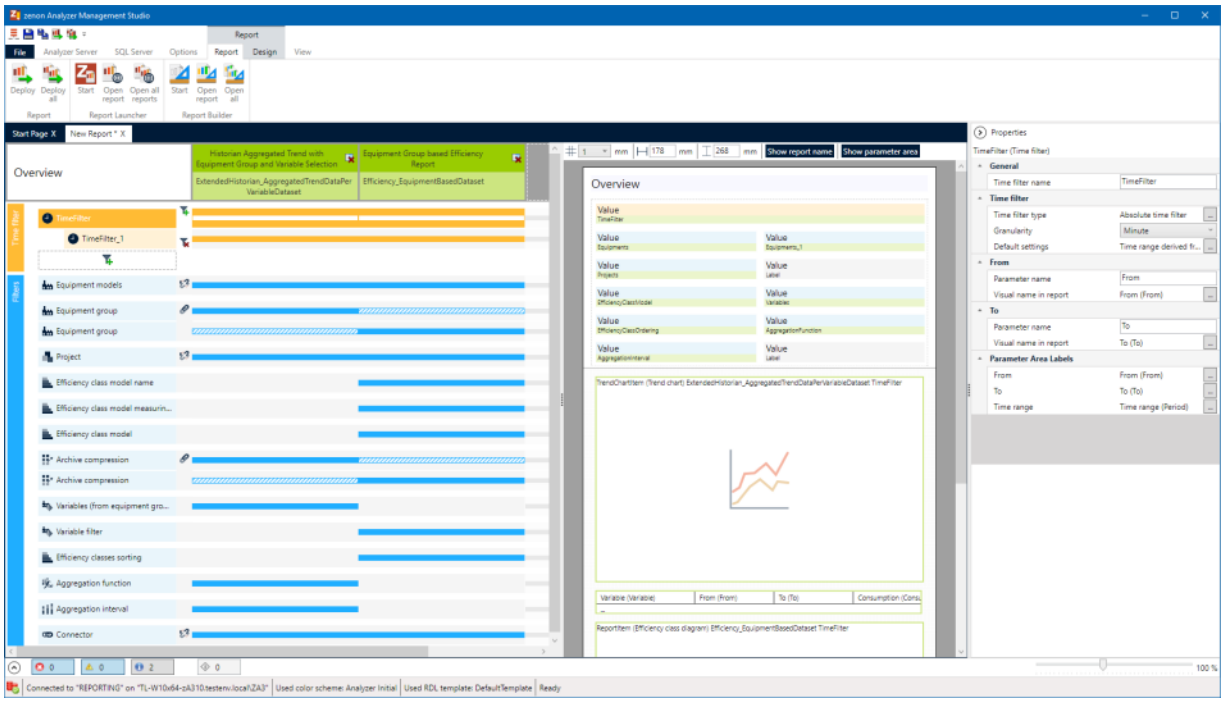
- **Tab**: SQL Server
- **Ribbon groups**:
  - **Database**
  - **Database backup**
  - **Administration**
  - **Data processing**
- **Standard button** in the **Database backup** Ribbon group:
  - **Restore**
    Contains the actions Restore, Restore as new database and Restore reporting services database.
- **Actions** in the **Database** Ribbon group:
  - **New**
  - **Convert**

OPERATING CONCEPT

The area to configure reports consists of:

- Area for report settings: Configuration from top to bottom.
- Design area: Arrangement of the report elements as they are displayed in the report.
- Properties area: Properties for settings and elements of the other areas

Preparation is carried out using the corresponding symbols in the ribbon.



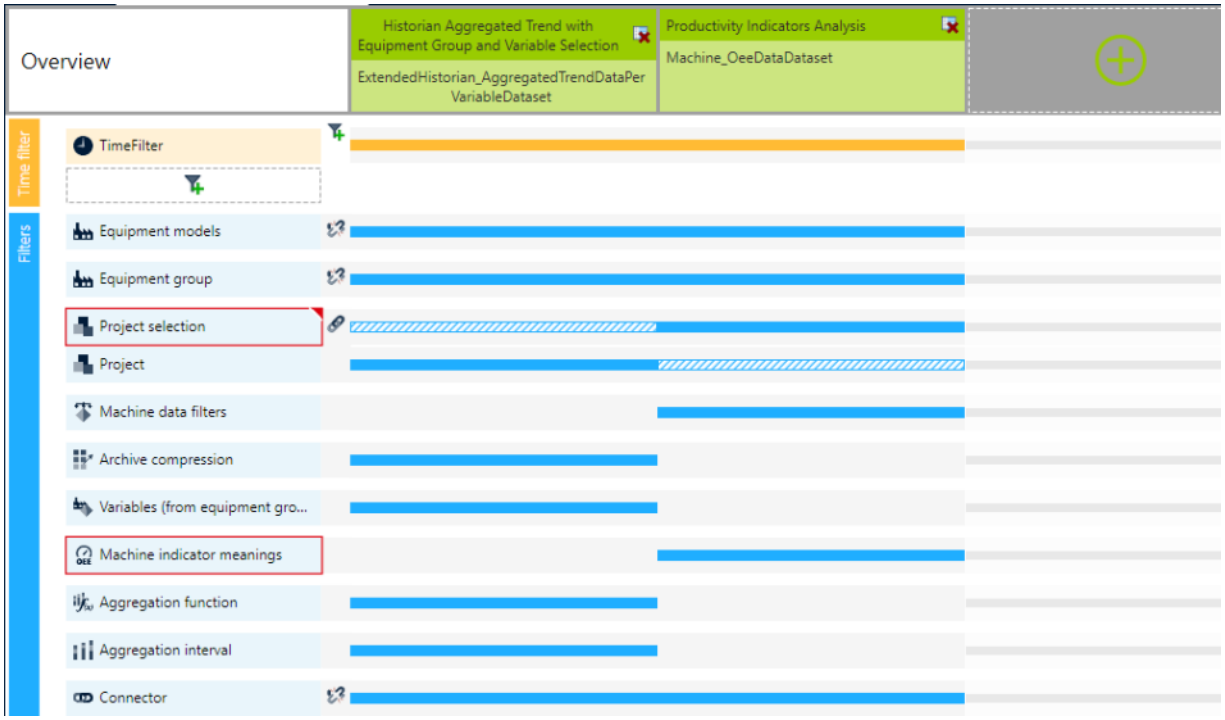
For the report configuration, it is recommended that you go from the higher-level aspects to the details:

1. Select the desired report template.
2. With several report templates: Select the report settings to be linked and link them.
3. Configure the report settings.
   Recommendation: Configure the report settings in the sequence in which they are offered in the report.
4. Configure the graphical appearance in the design area.

COMBINE SEVERAL REPORT TEMPLATES

Several main data sets can be inserted into a report. Either through a report that already contains some or by selecting several report templates for a report. In this case, in the area of the report settings, all settings of this main data set are also displayed. Commonalities of the attendant settings are shown as grouped.

Example:



Column	Contents
Column 1	Report settings
Column 2	Main data set 1
Column 3	Main data set 2
Column 4:	Possibility to add a further data set.

The assignment of the respective report settings to a main data set is shown through lines:

- Solid line: The report setting in this line is assigned to the main data set in the respective column.
- Dashed line: The report setting in this line is assigned to a different main data set. It can also be assigned using this. Grouping or substitution is possible.
- No line: The report setting in this line is assigned to a different main data set. It also cannot be assigned to this data set. Grouping or substitution is not possible.

  In the example, the upper variable filter is assigned to the main data set 1 and the lower variable filter to main data set 2.

Groupable report settings can be summarized. Their configuration is then applicable to all data sets for which they have been compiled. This allows the linking of several report templates.

To link report settings:

- Click on the symbol to link between column 1 and column 2.
  Or:

- Drag a solid line to a dashed line with the mouse.

RULES FOR GROUPING

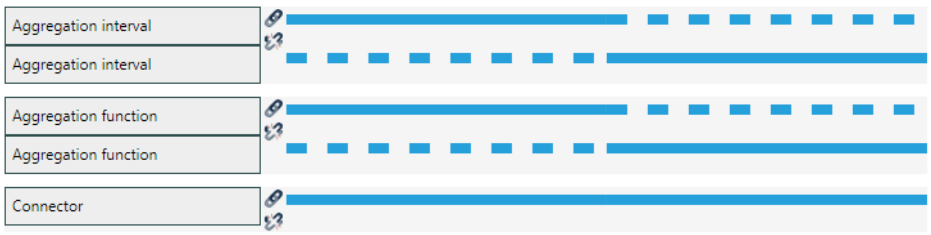
The following is applicable for grouping:

- Grouping can be made and removed at any time.
- When grouping, all settings needed by the setting to be grouped are also grouped.
  - Variables also group projects. Projects do not group variables.
  - The settings of the group that are linked to another replace its settings.
- Groupings can be removed again using the symbol to remove the grouping.
  - When removing a grouping, all settings that need the setting that is to be removed are also removed.
    Remove variables, does not remove projects. Remove projects, removes variables.
  - When removing a grouping, the first report setting contains the group of configured settings. All others are given the default settings.

EXAMPLES

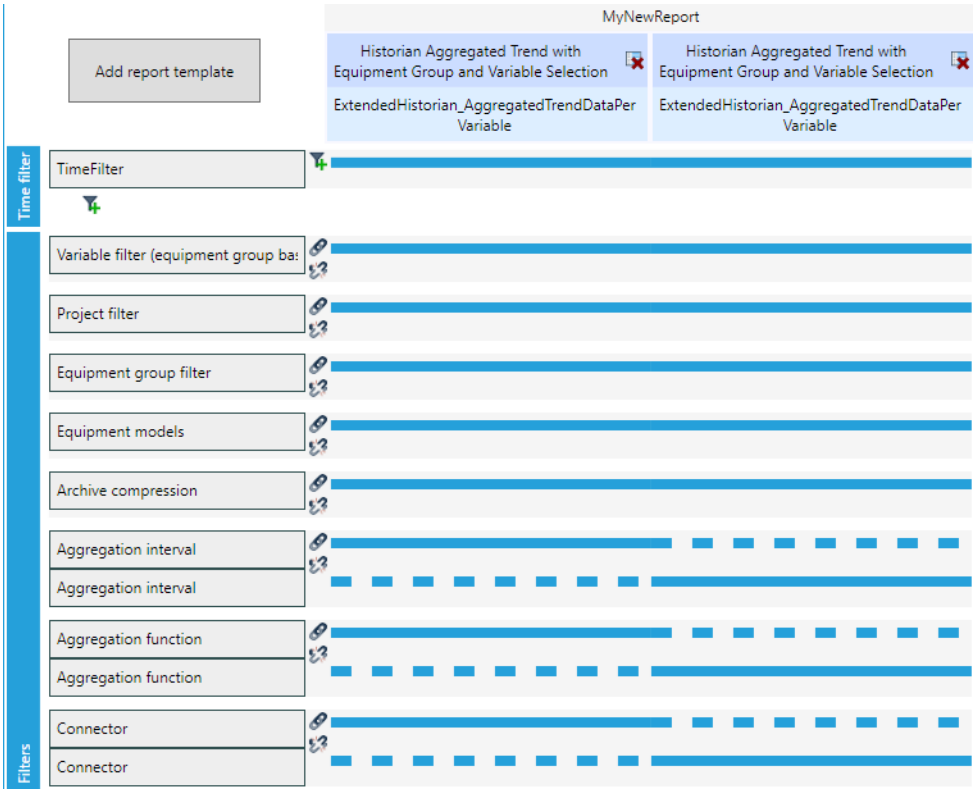
SIMPLE GROUPING

Archive compression and the connector are grouped in the following screenshot. Its settings thus apply to both main data sets.



DEPENDENT GROUPINGS

Only the variable filter was grouped in the following screenshot (at the very top). All other groupings are carried out automatically.



4. Reports

Changes to reports:

COMPARISON REPORTS

Comparison reports are no longer supplied. zenon Analyzer 3.10 allows the user free configuration of reports with several data sets and time filters.

PRODUCTION ANALYSIS MACHINE BASED

In zenon Analyzer 3.00, selection from 4 prescribed filters was possible. Now, a free number from 0 to 10 user-defined data filters can be used. In order for a data packet to be included in the calculation, there must be a value from the value list present for each data filter.

A data set is always a collection of values for all variables found that have the same time stamp. For the calculation of the summated times in the period under review, only data sets that correspond to all activated data filters are used. Data filters are configured by the user in the **machine data filter configuration** dialog for the **machine data filter** report setting.

5. Compatibility

In version 3.10, report templates (`zams_rep` files) that have been created with the versions 2.00 to 3.00 can be created. These are converted and saved as version 3.10 files.
Process during conversion:

- The previous report template is converted to a suitable version 3.10 report template.
  If the previous report template was a comparison report, two time filters are created. Otherwise a time filter is created.
- All settings of the previous report template are transferred to the new report template. If there is no preset from the previous report for a new setting, the default value is used.
- The report elements are applied and added to the design area.
- The settings for the parameter output area correspond to the default in the automatically-created layout.

The report templates of the old structure are mapped to their successor in the new structure. This was previously possible for the following report templates:

- Extended Historian Analysis - Historian Aggregated Trend with Equipment Group and Variable Selection
- Production Analysis Machine Based - Productivity Indicators Analysis
- Efficiency Class Analysis - Equipment Group based Efficiency Report

CONVERSION

Notes on conversion:

- **OEE indicators** and **OEE indicator lot archive:**
  During conversion, archive IDs are only transferred if the project can be read from the existing report template from the previous version and can be found in the metadata using the ID. The project IDs of the versions must be identical.

SUPERSEDED REPORT TEMPLATES

Some report templates are no longer offered in version 3.10, because they can be individually configured in version 3.10. These are mapped and amended to other report templates during conversion. In doing so, these report templates primarily get 2 time filters.

HISTORIAN AGGREGATED TREND WITH ONLINE VARIABLE SELECTION

The **Historian Aggregated Trend with online variable selection** report template is no longer supplied from version 3.10. The **Historian Aggregated Trend** has replaced it. Existing reports with the report template that no longer exists are converted to reports with active dataset pivoting when updating to version 3.10.

In doing so, please note:

- Conversion to a cycle of one second is no longer supported.
  Reports in which this is activated can no longer be upgraded.
- All included variables must have the same aggregation in the archive.
  Reports whereby variables with different aggregations are included in the archive cannot be upgraded.
- The main data set is set to pivoted for the upgraded report. The projects, archives and variables are read from the metadata and the filter settings are assigned corresponding values. The creation and execution of the Stored Procedures for the filter settings can take some time.
- The pivot columns are read when upgrading. An attempt is made, according to the connector set, to get data via the Stored Procedure of the main data set. If no data can be obtained, no pivot columns are detected. Upgrading can take some time.

6. Language table

The language table provides texts for reports in different languages on the basis of key words. This allows system texts to be translated to several languages and your own key words can be added and translated. The texts from the language table are added to the **RDL** when a report is presented.

Users can do the following by means of the language table:

- Change system texts
  (with the exception of names and descriptions of themes and templates)
- Add and delete some texts
- Reset the language table to the standard of the system texts
- Export changes to an XML file

You start the language table by means of:

- The **Language table** entry in the **Options** Ribbon
  or
- The symbol in the **Selection of key word from language table** dialog

LANGUAGES

The language tables provides system texts in eight languages:

- Chinese
- German
- English
- French
- Italian
- Russian
- Spanish

Czech

You can find further information on the new language table in the **Language table** chapter in the **zenon Analyzer Management Studio** manual.

7. Technical basics

The zenon Analyzer:

1. acquires data
2. compresses data
3. manages meta data such as equipment structure
4. manages templates
5. manages access rights and authorizations
6. calculates evaluations
7. distributes evaluations to Clients

> **Attention**
>
> Variable names must not contain two or more consecutive spaces. If several consecutive spaces are included, this can lead to a Javascript error when called up in the Report Launcher (**Error 500**).

GENERAL REQUIREMENTS

zenon Analyzer needs for:

- the creation and management of reports:

- An SQL Server 2016 database and
- the SQL Server 2016 reporting services

- the display of reports: Browser

A good knowledge of SQL and MS Report Builder 3.0 is required in order for you to create your own reports.

For details about the technical requirements see chapter Technology (on page 17).

HARDWARE AND SOFTWARE REQUIREMENTS

HARDWARE

Analyzer Server:

Parameter	Recommended	Minimum
CPU	Quad-Core Server CPU (maximum 24 cores/4 sockets)	Quad-core
RAM	Up to 128 GB	12 GB
Free memory	200 GB	10 GB

Engineering computer:

Parameter	Recommended	Minimum
CPU	Dual Core	Pentium IV
RAM	4 GB	1 GB
Free memory	200GB	2 GB
Monitor (pixels)	1920 x 1080	1024 x 768

SOFTWARE

Analyzer Server:

A 64-bit operating system is required for the database server. The following are supported:

- Windows Server 2012 R2
- Windows Server 2012
- Windows Server 2016
- Windows 8.1 64-Bit
- Windows 8.1 Pro 64-Bit
- Windows 8.1 Enterprise 64-Bit

- Windows 8 64-Bit
- Windows 8 Pro 64-Bit
- Windows 8 Enterprise 64-Bit
- Windows 10 Home 64-Bit
- Windows 10 Professional 64-Bit
- Windows 10 Enterprise 64-Bit

Note: An installed IIS service (on page 36) is required for the installation of the server.

Engineering computer:

The following are supported for ZAMS, the manual data editor, metadata editor and migration tool:

- Windows Server 2012 R2
- Windows Server 2012
- Windows Server 2016
- Windows 8.1 32-Bit and 64-Bit
- Windows 8.1 Enterprise 32-Bit and 64-Bit
- Windows 8 32-Bit and 64-Bit
- Windows 8 Pro 32-Bit and 64-Bit
- Windows 8 Enterprise 32-Bit and 64-Bit
- Windows 10 Home 32-Bit and 64-Bit
- Windows 10 Professional 32-Bit and 64-Bit
- Windows 10 Enterprise 32-Bit and 64-Bit

Web browser:

- Internet Explorer 11 (normal view only)
- Internet Explorer 10 (normal view only)
- Chrome
- Firefox

  Note: Zoom in the report is only possible with Chrome.

Recommended HMI/SCADA system:

- zenon 7.60.

.NET Framework 4.6.1:

- .NET Framework 4.6.1 has to be already run capable on the target computer in order to end the installation successfully.

DATA PREPARATION

The data preparation (on page 48) is done in several levels. With this data from different sources and formats can be evaluated universally and maintained easily.

DATA STRUCTURES

The data origin either from static project data or from dynamic user data. For details see chapter Data structure.

DATA COLLECTION

The zenon Analyzer accesses data non-invasively via connectors. Source systems need not be reconfigured. The existing infrastructure is embedded in the reporting of the zenon Analyzer independent of the manufacturers. For systems other than zenon 6.x, only a connector container is installed. This installation does not interfere in the Runtime system and does not interrupt the process.

8. Technology

In this section you learn about the technically needed requirements for

- Server
- Client
- Data Sources
- Development station

and the supported standards for

- Interfaces

SERVER

SQL SERVER 2016 DATABASE

In the database there are the meta data and possibly also user data saved in SQL. For the query, stored procedures (Level 2 (on page 50)) are executed. They again revert to **user defined functions** for data acquisition and data abstraction. If needed, they load the connector stub which requests the user data from the target system online. In addition there are the **user defined functions** which provide auxiliary functions for the evaluation.

SQL SERVER 2016 REPORTING SERVICES

The reporting services run as web application and as web server provide the Clients with all reports for displaying in the web browser. In addition, the parameters for the data source, reports, etc. are set using the **Report Launcher** web front end.

The path to **Report Launcher** is: **http://[computer name]/Reports_za3.**

REPORTING LICENSE SERVICE (ZRSLICSRV)

The reporting license service checks the CodeMeter dongle and the license (on page 33) available at the Server and forwards the licensing information to all involved components. It also has the list of all Client leases.

DATA SOURCE

CONNECTOR CONTAINER

On all computers which can server as data source, the connector container together with its different connectors must be installed and started. The TCP port of the connector container must be reachable from outside.

DEVELOPMENT STATION

ANALYZER EXPORT WIZARD

The Analyzer Export Wizard is integrated in the zenon Editor and is used to import the metadata to the SQL Server 2016 database. The wizard offers full support for zenon 7.xx. Older versions of the zenon Editor are not supported.

INTERFACES

The zenon Analyzer supports the following interfaces:

- zenon Runtime 5.50, 6.x, 7.x
- SQL

8.1 Client

There must be a web browser on the client to display and configure reports.

Information

zenon Analyzer was designed and tested for the following browsers:

- Microsoft Internet Explorer from version 10
- Chrome
- Firefox

Note:

- Compatibility view must be deactivated for Internet Explorer.
- Zoom is only available for the Chrome browser.

DOUBLE CLICK IN THE TREE STRUCTURE FOR EQUIPMENT MODEL DEPENDENT ON BROWSER

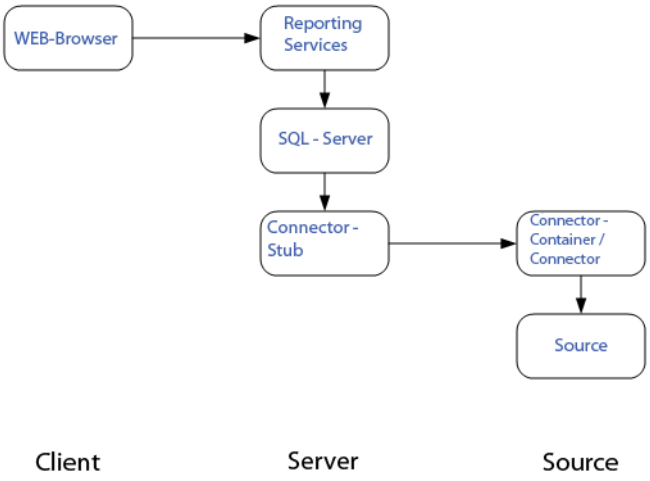
Different browsers react differently to a double click on a node in the tree structure:

- Internet Explorer:
  The opposite of the currently visible stats of the node that has been clicked on is passed on to the lower objects and transferred to the nodes.
  For example: The checkbox of the node is not ticked. Double clicking ticks the checkboxes of the node and all its sub-items.
- Chrome and Firefox:
  The current status does not change and is passed on to the lower objects.
  For example: The checkbox of the node is not ticked. Double clicking does not tick the checkboxes of the node and all its sub-items.

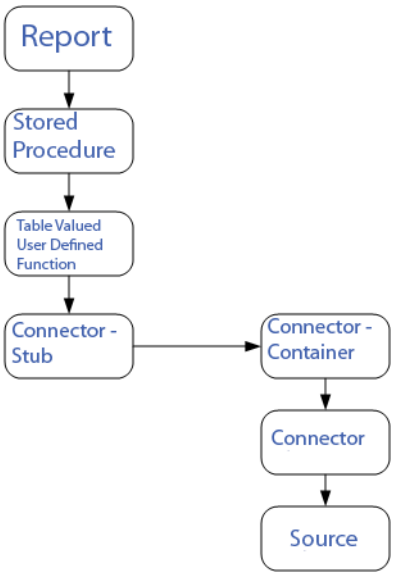
9. Architecture

The zenon Analyzer links data from different, heterogeneous sources to valid reports in real time. The reports react dynamically to data base changes.

COMMUNICATION FROM PROCESS POINT OF VIEW



COMMUNICATION FROM DATA POINT OF VIEW



ZENON ANALYZER

The zenon Analyzer consists of:

- Data Sources

- Connectors to the data sources
- Container for connectors and data harmonization
- Data filing
- Report Builder with filter and calculations
- zenon Analyzer Management Studio for creating and administering reports
- Web Server
- User interface at the Client for calling up and managing reports at the Client

PROCEDURE

Reports are configured and published by administrators or users.

Reports can also be created by administrators with Microsoft Report Builder 3.0. Prerequisite is a wide knowledge in SQL. For information about MS Report Builder refer to the corresponding help of the Microsoft Report Builder. End-users call up reports via the interface of their Client.

Data required for the report is collected via connectors and harmonized before use. With this, reports are also meaningful for different sources, time zones, etc.

10. Time formats

Three time formats are used:

- Local time: is used in reports
- UTC: is used in abstracted historical and current values and in database tables
- Unix time: is used in SQL tables

LOCAL TIME

Queries in the report and the display of results is done in local time.

UTC

Abstracted historical and current values are stated in UTC. For the display in the reports it is converted to local time.

UTC means Coordinated Universal Time. The time unit is second. UTC is the uniform basis for the international time determination and is made available to the public via time senders and other time services. Dependent on the time zone certain time periods must be added or subtracted to or from

UTC. This time period can vary one hour because of the day light saving time.
Example:

Country	Local time
Alaska	UTC -9
Australia, Queensland	UTC +10
Bulgaria	UTC +2
United Kingdom	UTC
Korea	UTC +9
Central Europe (CET)	UTC +1
Central Europe (CET) Daylight Saving Time	UTC +2
Saudi Arabia	UTC +3
USA East coast	UTC -5
United Arabic Emirates	UTC +4

CONSEQUENCES TO THE CONFIGURATION

Engineered date and time mean different date and time depending on the execution location of the Runtime.

For example: In the Editor you engineer in the PFS for the execution of a function in time zone **UTC +1** the local time `14:00 o' clock`. After transferring the files to a Runtime in tiem zone **UTC +10**, the function is carried out at `23:00 o' clock`. Unix time

In the SQL databases Unix time is used, e.g..:

- evacuated archives
- exported archives
- exported alarms
- exported CEL

PROCEDURE

- Query in reports are dispalyed in local time.
- The hand over from report to the table valued user defined functions is done in UTC.
- Query to SQL are converted to Unix time.
- Results are converted to UTC and displayed in the report as local time.

CHANGE STANDARD TIME/DAY LIGHT SAVING TIME

The switch from standard time to daylight saving time and vice versa can lead to anomalies with intervals at the time of switching. These arise as a result of the functions provided by the **.NET Framework** , **DateTime.ToLocalTime** and **DateTime.ToUniversalTime**.

INTERVALS

Compression	DSTstart	DSTend
Minutes	▸ Interval in local time: **DSTstart** – 1 minute, **DSTstart** + 1 hour) ▸ Interval in **UTC**: 1 minute	▸ Interval in local time: **DSTend** −1 minute, **DSTend** ▸ Interval in **UTC**: 1 hour and 1 minute
Hour	Interval (**DSTstart**, **DSTstart+1**) is not present.	▸ Interval in local time: **DSTend** –2, **DSTend** −1 ▸ Interval in **UTC**: 2 hours

Key:

- **DSTstart**: Time of the switch from standard time to daylight-saving time in local time. This means: The clocks are moved forward by 1 hour at the time of **DSTstart**.
- **DSTEnd**: Time of the switch from standard time to daylight-saving time in local time. This means: The hours are put back by 1 hour at the time of **DSTend**.

The **zrsGetCompressionIntervalIsCarpetPlot** UDF is used for the calculations.

11. Prerequisites

The following prerequisites are applicable for work with the zenon Analyzer:

ANALYZER SERVER HARDWARE AND SOFTWARE

HARDWARE

Analyzer Server:

Parameter	Recommended	Minimum
CPU	Quad-Core Server CPU (maximum 24 cores/4 sockets)	Quad-core
RAM	Up to 128 GB	12 GB
Free memory	200 GB	10 GB

Engineering computer:

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Note: An installed IIS service (on page 36) is required for the installation of the server.

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Web browser:

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- Chrome
- Firefox

  Note: Zoom in the report is only possible with Chrome.

Recommended HMI/SCADA system:

- zenon 7.60.

.NET Framework 4.6.1:

- .NET Framework 4.6.1 has to be already run capable on the target computer in order to end the installation successfully.

CONNECTORS

The following is applicable for the SCADA Runtime connector:

- Timeout: is independent of the report timeout.
  Default: 5 minutes (can be configured)
- Variables: Only variables that are listed in metadata are requested
- String variable: maximum of 4000 characters

The performance of a connector depends on the:

- Performance of the Analyzer server
- Performance of the Runtime server
- Load of the Runtime servers (connector runs with low priority)

- Network performance and network load

PROJECTS AND FILTERS

Reports can generally be created throughout several projects.

> **Attention**
>
> *Only archive data with variables from its own project can be evaluated.*
>
> *This means: For example, in an integration project, if a variable from a subproject is archived in an archive, then zenon Analyzer cannot access this variable.*

SCHEDULES

- **Calendar days in months** are limited to `1 - 28` (corresponds to February in non-leap years)
- The "`Month end`" event is not available

ANALYZER EXPORT WIZARD

The Analyzer Export Wizard works, depending on the version, with different zenon Analyzer versions and different zenon versions. For details, read the **Analyzer wizard compatibility** chapter.

> **Information**
>
> *Do not use zenon color palettes for dynamic limit values for zenon projects whose data is to be exported for zenon Analyzer. Limit values cannot be dynamically amended in zenon Analyzer. Information from color palettes can therefore not be evaluated. This can lead to illegible graphics.*

12. Installation and updates

The installation of zenon Analyzer consists of several components:

- Analyzer Server:
  Central SQL server.
  Note: Before installation, the IIS service (on page 36) must be installed on the operating system.

- zenon Analyzer Management Studio:
  Tool for the administration of zenon Analyzer and to create reports. It must be installed on the engineering computer:

You can find the hardware and software requirements in the Prerequisites (on page 23) chapter.

NOTE:

- ### .NET Framework 4.6.1
  `.NET Framework 4.6.1` has to be already run capable on the target computer in order to end the installation successfully. Otherwise, an error notification from the <CD-ZRS> setup will show up and the installation process will be canceled.
- ### Remote installation
  The installation medium must be on the local computer. Network drives may not be available punctually for a reboot during installation. For remote installations and virtual installations, copy the content of the installation medium to a temporary folder on the computer and start the setup.
- ### SQL Server Management Studio
  If the SQL Server Management Studio (SSMS) is to be available, it must be installed manually. You can find the setup on the installation medium in the following path: `\AdditionalSoftware\SSMS\SSMS-Setup-ENU.exe`.

  > **Attention**
  >
  > *Ensure that you have the appropriate licenses (on page 33).*

NOTE FOR WIZARDS

Several wizards are available for zenon Analyzer. This works with different zenon Analyzer versions and zenon versions. For details, read the **Analyzer wizard compatibility** chapter.

CARRYING OUT THE INSTALLATION

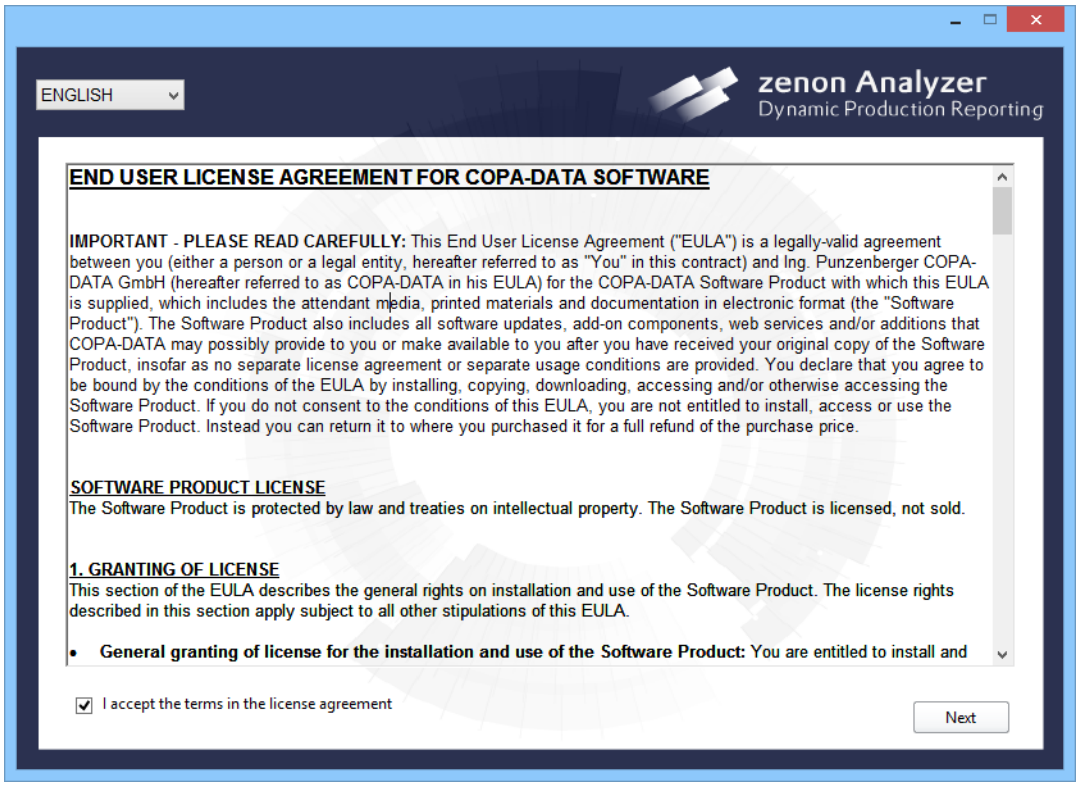
To install zenon Analyzer components:

1. Ensure that the components required for installation are already installed on the system.
   - General: .NET Framework 4.6.1
   - Server: IIS service (on page 36)
2. Connect the installation medium to the computer or copy its contents to a local folder.
   If Autorun does not automatically start the setup, use the file named `start.exe`.
3. Select the desired language from the drop-down list
4. Accept the license agreements

5. Click on the **Next** button.
6. Select the desired components
7. Click on the **Next** button.

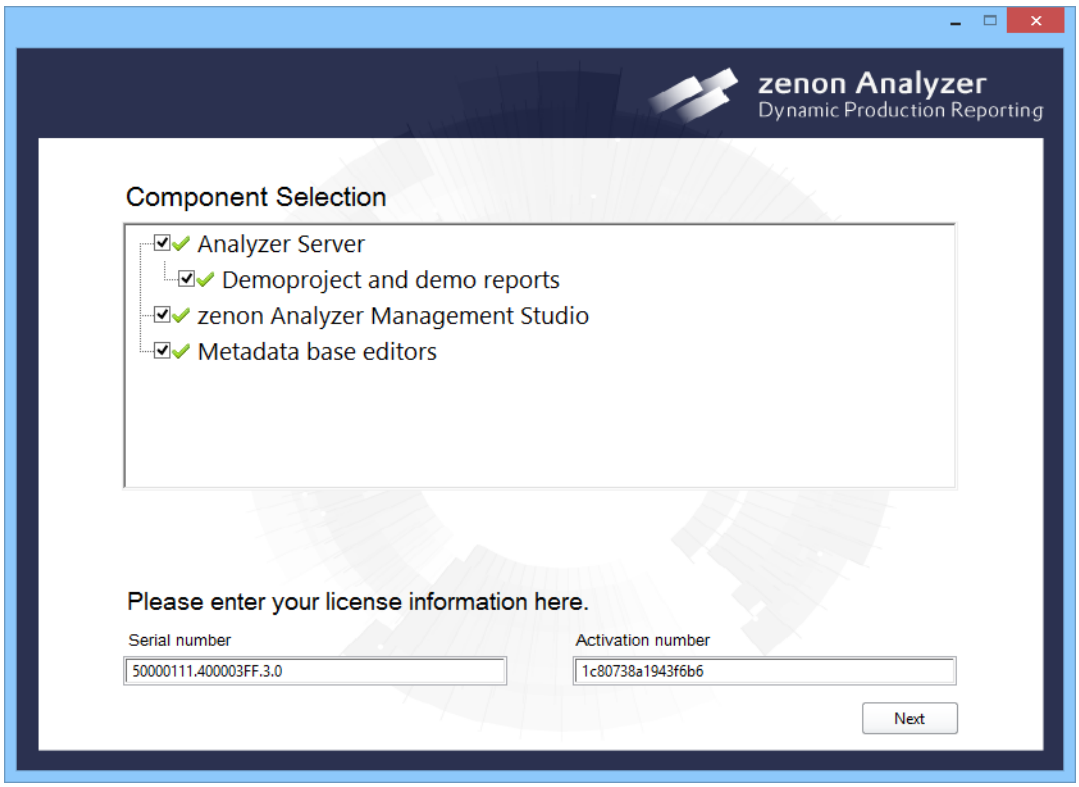
   The installation or the update will start.
8. Follow the instructions given to you by the installation wizard.

START WINDOW



Parameter	Description
Drop-down list "Language"	Selection of the language for the installation. The following are available: ▸ German ▸ English ▸ French ▸ Italian ▸ Spanish
License agreements	License agreement with conditions of use for zenon Analyzer. For installation, the requirements must be accepted by clicking on the **I accept the conditions of the license agreement** checkbox.
Next	Switches to the next step of the installation. Only active if the **license agreements** have been accepted.

MODULE SELECTION

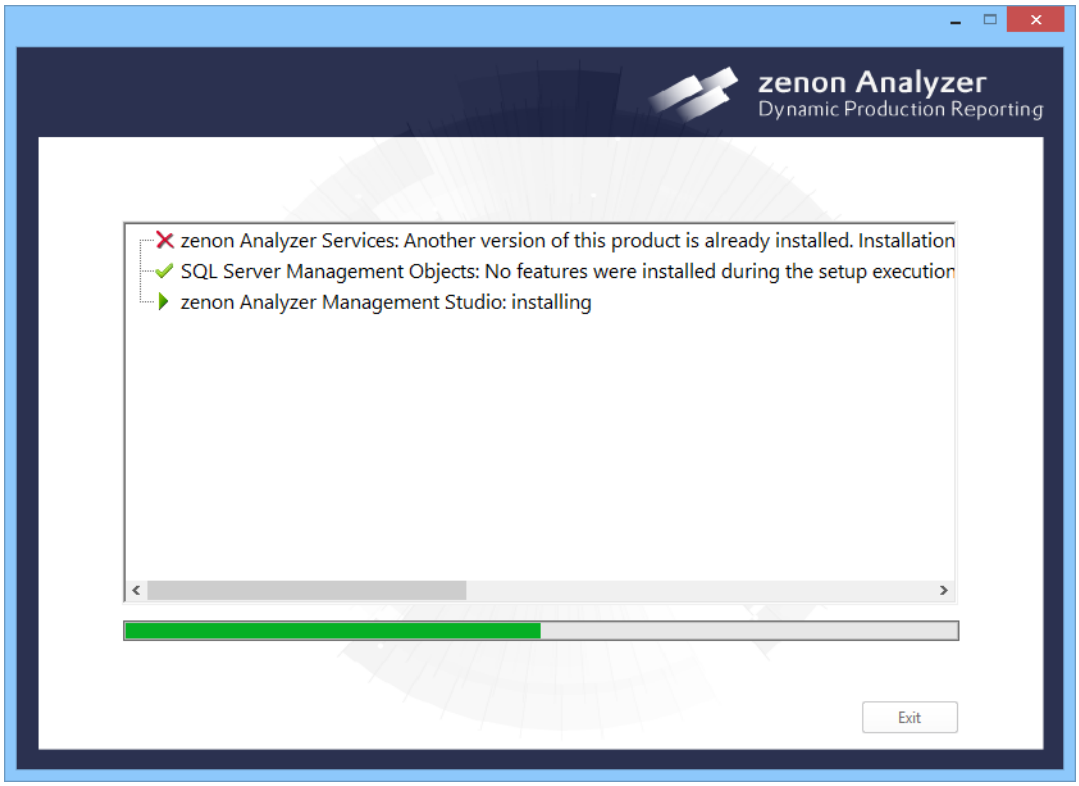


Parameter	Description
Module selection	Selection of the components to be installed by activating the corresponding checkbox. ▸ **Analyzer Server**: Central SQL server. Requirement: 64-bit operating system and installed IIS service. ▸ Demo project and demo reports: Example database Requirement: 64-bit operating system and zenon 7.50. ▸ zenon Analyzer **Management Studio**: Tool to create and administer sever connections and reports. Pre-requisite: 32-bit or 64-bit operating system. ▸ Metadata database editors
Serial Number	Entry of the serial number for licensing (on page 33). Only present if the Analyzer Server is to be installed. If there is already a serial number on the system, this is entered automatically.
Activation number	Entry of the activation number. Only present if the Analyzer Server is to be installed. If there is already an activation number on the system, this is entered automatically.
Next	Starts the installation. Only active if modules are selected for installation.

SYMBOLS MODULE SELECTION

Symbol	Meaning
✓	Installation can be carried out.
✗	Installation not possible.

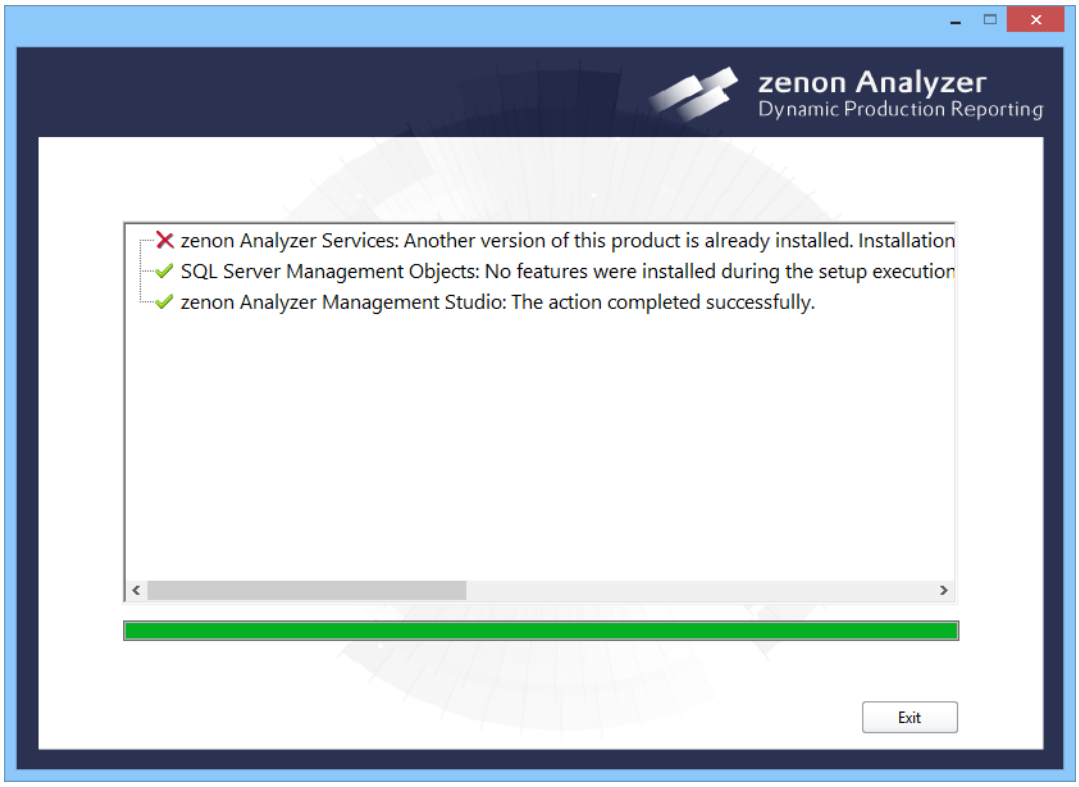
INSTALLATION PROGRESS



The course of installation is shown in its own window with symbols:

Symbol	Meaning
	Not yet installed
	Is currently being installed
	Installation OK
	Installation failed

After successful installation of all desired components, end the installation wizard by clicking on the **Exit** button.



INSTALLATION ON THE CLIENT

Only a current browser is needed on the client. The language that is set in the browser determines the language for the Report Launcher. The language for zenon Analyzer Management Studio is specified in the ZAMS options.

13. Licensing

The components of zenon Analyzer must have a valid license.
There are the following restrictions without a valid license:

- No external access via the default access site is possible.
- There is no connector functionality
- Report templates and reports cannot be used.
- ZAMS only provides the following functionality without a license:
  - Information on servers and licenses
  - Input of licenses
  - Start **Metadata Editor**
  - Start **Manual Data Editor**
  - Start **Migration Tool**
  - Configuration of color scheme
  - RDL template
  - Configuration of settings
  - Displays of version information
  - Opening the help

  Note: If a license is lost during ongoing operation, reports that are open in ZAMS are closed. You are able to save them before they are closed.

Entry of the license data is carried out during installation for the Analyzer Server and via the zenon Analyzer Management Studio or the zenon licensing for all other components as required.

Note: A new zenon Analyzer license is only accepted if you have enough client licenses for all users with a dedicated license.

LICENSING IN WORKGROUPS

For licensing for computers that are not in domains, but in Windows workgroups, note the procedure in the Licensing in workgroups (on page 35) chapter.

LICENSING VIA ZAMS - ZENON ANALYZER MANAGEMENT STUDIO

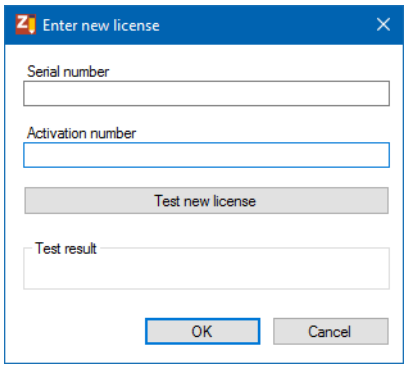
To enter new license data:

1. In the **Analyzer Server** Ribbon or in the **Show license** dialog, select the **License product** button. If there is no license, there is also a corresponding action available on the start page.

The dialog with the license information is opened.

2. Enter **serial number** and **activation number**.
3. Click on **Check new license**.
4. If the result is positive, click on **OK** to activate the license.

ENTER DIALOG LICENSE



Option	Description
Serial Number	Entry of the serial number.
Activation number	Entry of the activation number.
Test new license	Clicking on this button tests inputs before they are written to the license server, to see if: ▸ License data entered has the correct syntax ▸ a license can be occupied with the data entered ▸ The activation key corresponds with the serial number In order for the test to be started, both **serial number** and **activation key** must have been entered.
Test result	Displays the test result of **Test new license**.
OK	Writes the license entered to the license service on the Analyzer server and closes the dialog. The result of writing the license is displayed in the output window. In order for the license data to be written, both **serial number** and **activation key** must have been entered.
Cancel	Closes the dialog without writing data to the license service.

> **Attention**
>
> *If incorrect license data is entered, the access to the Analyzer server is blocked for all clients. Always check the new license data by clicking on the* ***Test new license*** *button before you set the license by clicking on* ***OK****.*

ENTRY IN ZENANALYZER.INI

The license information are saved in file **zenAnalyzer.ini** (on page 40) in the zenon system folder.

- Section **[DEFAULT])**
  - Entry **SERIAL3=**
  - Entry **ACTIVATIONKEY3=**

The CodeMeter check and management of simultaneous access is done via service `zrsLicSrv`.

For details about licensing and the CodeMeter dongle, see the Licensing manual, CodeMeter chapter.

13.1 Licensing in workgroups

Licensing for workgroups is different from the licensing for domains.

REQUIREMENTS

For licensing within workgroups, the zenon Analyzer License Service must work in Workgroup mode. To do this, the following requirements must be fulfilled:

- The computer that acts as the Analyzer Server must be a member of the workgroup.
- All users of the workgroup must also exist on the Analyzer Server.
- The license service on the Analyzer Server must run in the user context of a user of the workgroup. Other computers of the workgroup are thus recognized as members of the group.

CHANGING LICENSE SERVICE USER CONTEXT

This is how you change the user context for the license service:

1. Open the administration of the local services.
2. Go to the **zrsLicSrv** service.
3. Stop the service.
4. Click on **Properties** in the context menu of the service.

The dialog with the properties of the service is opened.

5. Open the **Log in** tab.
6. Activate the **This account** radio button.
7. Enter the user name, password and password confirmation for the desired user.
8. Close the dialog by clicking on **OK**.
9. Start the service.

14. IIS Publishing service installation

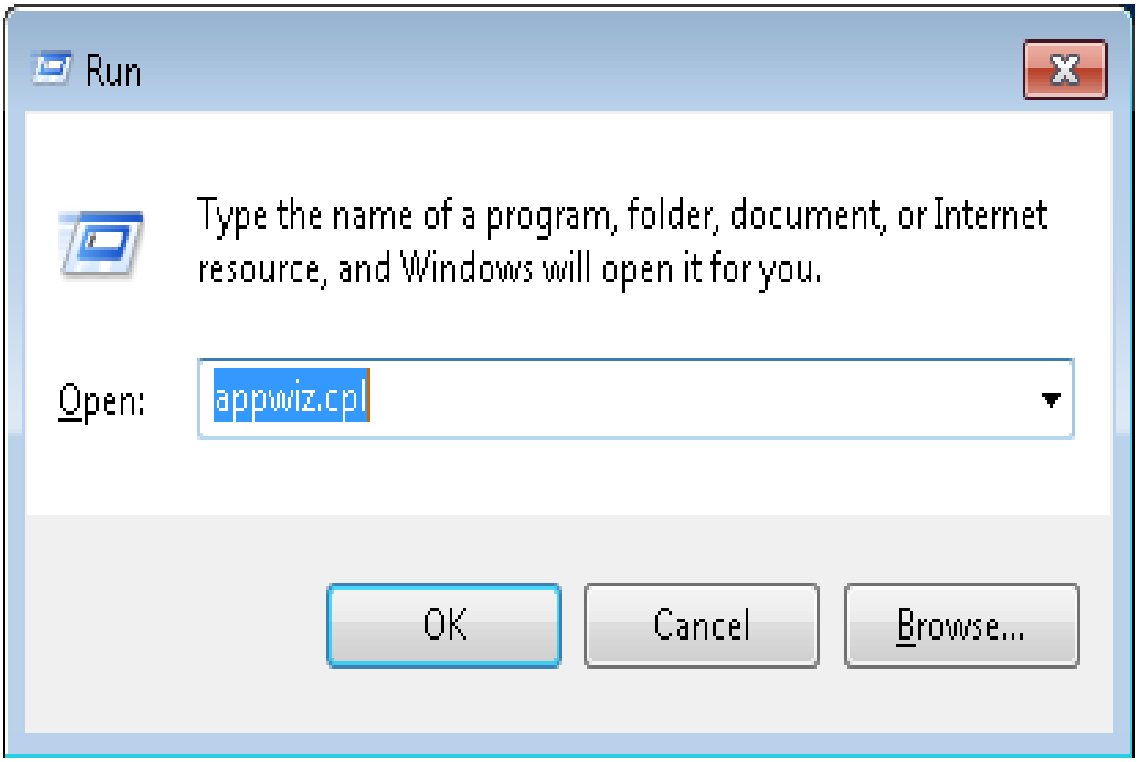
The IIS publishing service must be installed before the installation of zenon Analyzer on the system. The details of the process are different for different operating systems.

WINDOWS 8 AND 8.1

To activate the IIS publishing service:

1. Press the `Windows key + R` keyboard shortcut.

   The dialog to enter a command for the command input is opened.

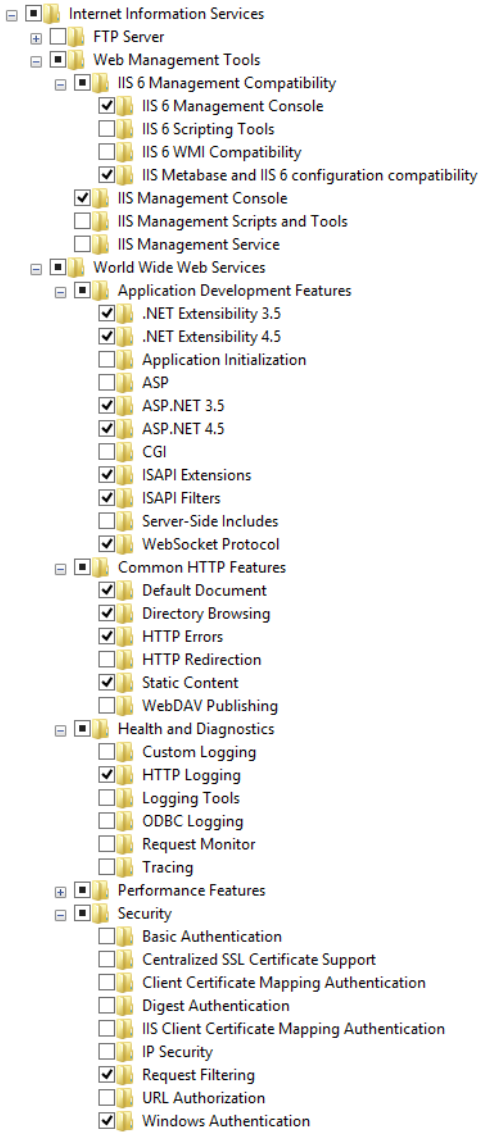


2. Enter `appwiz.cpl` in the input field.

   Click on **OK**.
   A new control panel window to configure programs and **Windows features** is opened.

3. In this window, click on **Turn Windows features on or off**.

   The window to select features of the operating system is opened.



4. Expand the **Internet information services** in this node.
5. Activate all **World Wide Web Services** there.
6. Expand the **General HTTP features** node.
7. Activate **Static content**. Expand the **Application features** node.
8. Activate **ASP.NET 4.5**

9. Expand the **Web administration tools** node.
10. There, activate the **IIS administration console**.
11. Expand the **Security** node.
12. Activate **Windows authentication**.
13. Click on **OK**.

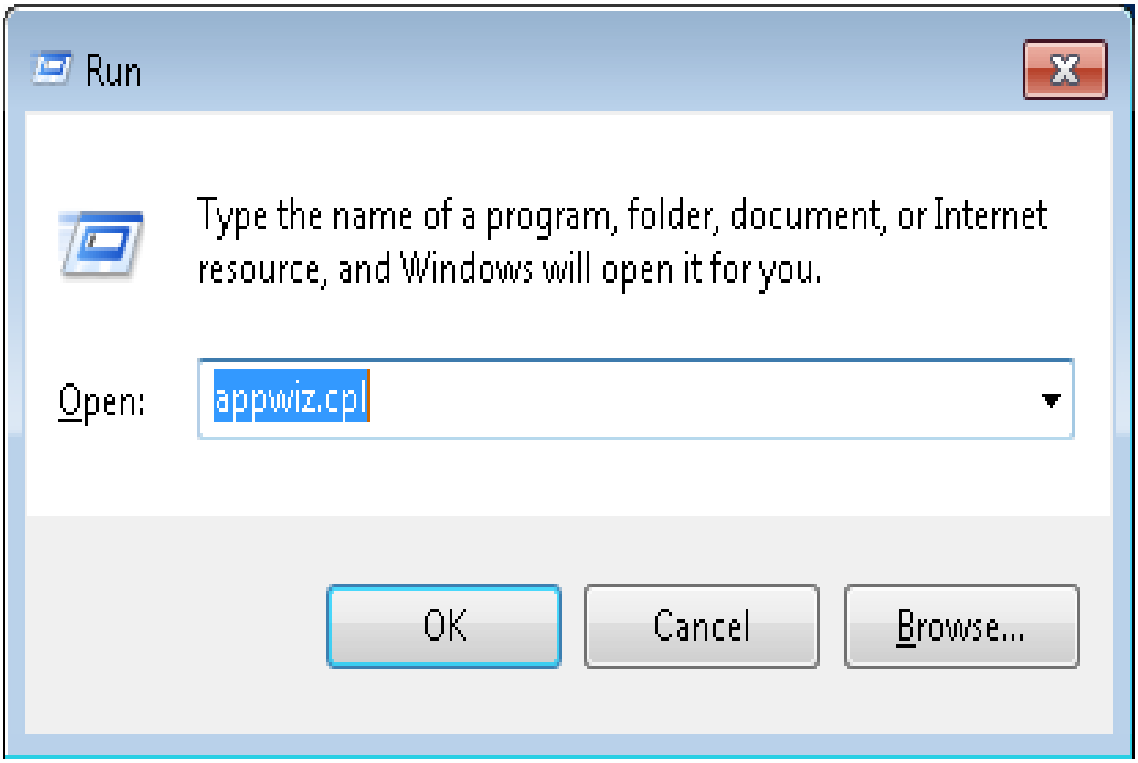
Note: The **WebSocket** protocol must also be activated.

WINDOWS 10

To activate the IIS publishing service:

1. Press the `Windows key + R` keyboard shortcut.

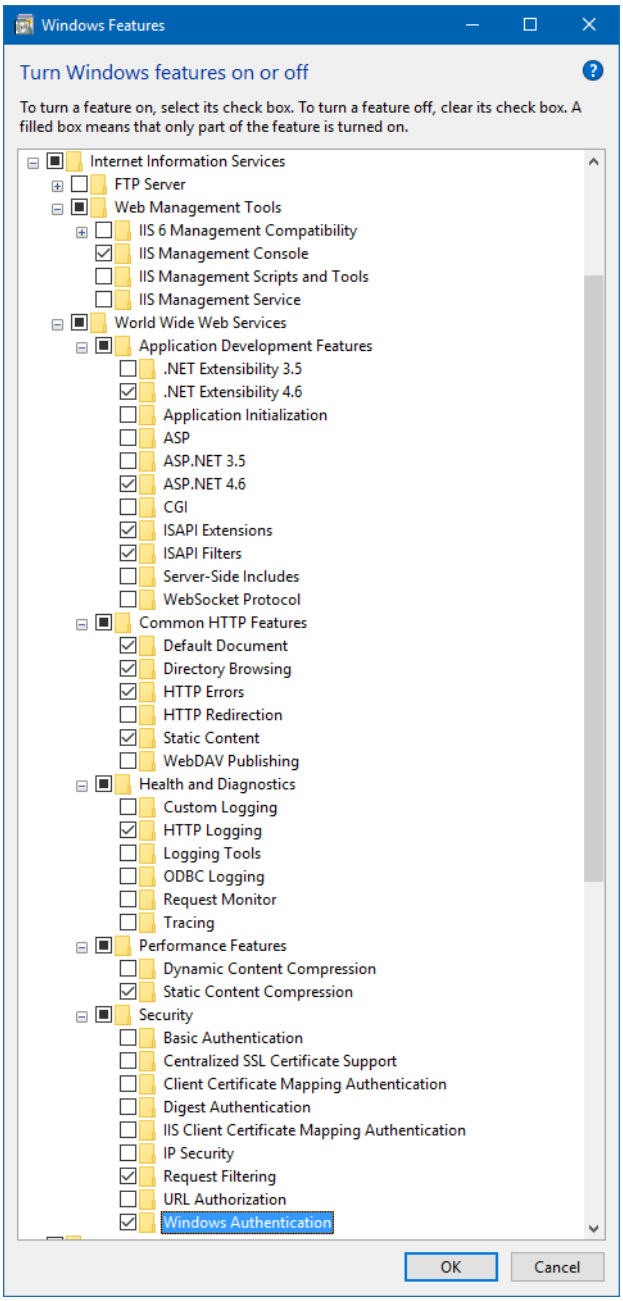
   The dialog to enter a command for the command input is opened.



2. Enter `appwiz.cpl` in the input field.

   Click on **OK**.
   A new control panel window to configure programs and **Windows features** is opened.
3. In this window, click on **Turn Windows features on or off**.

The window to select features of the operating system is opened.



4. Expand the **Internet information services** in this node.
5. Activate all **World Wide Web Services** there.
6. Expand the **General HTTP features** node.
7. Activate the **static content**.
8. Expand the **Application development features** node.
9. Activate **ASP.NET 4.6**

10. Expand the **Web administration tools** node.
11. There, activate the **IIS administration console**.
12. Expand the **Security** node.
13. Activate **Windows authentication**.
14. Click on **OK**.

Note: The `WebSocket` protocol must also be activated.

WINDOWS SERVER 2012 (R2)

Follow the instructions from Microsoft: https://technet.microsoft.com/en-us/library/hh831475.aspx (https://technet.microsoft.com/en-us/library/hh831475.aspx)

1. Open the **Assistant to add roles and features** wizard.
2. Go to the **server roles**.
3. Activate the **Webserver (IIS)**.
4. Expand the **General HTTP features** node.
5. Activate the **static content**.
6. Expand the **Security** node.
7. Activate **Windows authentication**.
8. Expand the **Application development** node.
9. Activate:
    - **.NET expandability 4.5**
    - **ASP.NET 4.5**
    - **ISAPI extension**
    - **ISAPI filter**
    - **WebSocket protocol**

15. configuration file zenAnalyzer.ini

Settings for zenon Analyzer are amended in the **zenAnalyzer.ini** configuration file. This documentation contains information for system administrators who want to edit the INI files directly.

You can find the INI file in the following path: `%cd_system%`.
It is only present if the Analyzer Server is installed. If there is only Report Launcher or ZAMS on the system, there is also no **zenAnalyzer.ini**.

Information

Settings should primarily be made using the user interface of zenon Analyzer. Changes to the INI files are reserved for experienced users.

zenAnalyzer.ini contains the following sections:

Section:	Description
[DEFAULT] (on page 41)	General settings. Contains serial number and activation number.
[NETZ] (on page 43)	Settings for connection security.
[**USER_LEVELS]** (on page 43)	Information on users and user authorisations.
[DEDICATED_USERS] (on page 44)	Configuration of dedicated users.
[CONNECTION_ZA2] (on page 46)	Information for connections to version **ZA2** databases.
[CONNECTION_ZAX] (on page 46)	Information for connections to version **ZA3** databases and higher.
[DEBUG] (on page 47)	Activation of debugging.

The sequence of the sections and the entries in the sections can vary.

FORMAT IN WHICH THE INI FILES ARE SAVED

Due to the system, only ANSI and Unicode are supported for reading the INI files.

Attention

UTF-8 format is not supported!

You should therefore always save your INI files as a text file in ANSI or Unicode format.

16. General settings [DEFAULT]

General settings for the Analyzer Server instances ZA2 and higher.

These contain the serial number and the activation key. You change these settings in ZAMS using the license product dialog.

Entry	Description
[DEFAULT]	General settings for the ZA2 instance.
SERIAL7=	Serial number for licensing of a version 2.xx server. Is set by the license server. Default: 0000
ACTIVATIONKEY7=	Activation key for activation of the license of a version 2.xx server. Is set by the license server. Default: (empty)
[DEFAULT_X]	General settings for the ZA3 instance or higher. **X** is a placeholder for the respective version of the instance. Example: **[DEFAULT_3]** corresponds to instance ZA3.
SERIALX=	Serial number for licensing of the server from version 3.xx. Is set by the license server. **X** is a placeholder for the respective version. Example: **SERIAL3=** contains the serial number for version 3.xx. Default: (empty)
ACTIVATIONKEYX=	Activation key for activation of the license of the server from version 3.xx. Is set by the license server. **X** is a placeholder for the respective version. Example: **ACTIVATIONKEY3=** contains the activation key for version 3.xx. Default: (empty)

SERIAL NUMBER AND ACTIVATION KEY

These entries are set by the license server if it contains the command to use a new license. As long as the license server is running and has a valid license, these values are not read again. If the license server does not have a license or a valid license on starting, it reads these entries in an interval of 1 minute until it finds a valid license.

If one of the two entries **SERIALX=** or **ACTIVATIONKEYX=** has been amended manually in the INI file, the following situations can result:

- The previously-used license was was invalid.
  The license server automatically reads the new entries at the next attempt to validate the license.

- The previously-used license is valid.
  The license server does not read the new entries automatically.
  There are two methods to ensure that these new entries are read in:
  - Restart the **zrsLicSrv** license server service. This is the recommended method.
  - Ensure that the previously-used license becomes invalid.
    You can achieve this by removing the dongle for the previously-used license.
    Attention: Licenses for other applications that use the same dongle thus become invalid, for example zenon Editor or zenon Runtime. These applications are thus stopped.

17. Connection security and timeout [NETZ]

Settings for the connection security and timeout

CONNECTION SECURITY

Settings for connection security must only be set using ZAMS. To do this, use the **Configure connection security** dialog.

> **Attention**
>
> *Manual changes to these entries in **zenAnalyzer.ini** can lead to no connection to the Analyzer Server, license server or report server being possible any more.*

TIMEOUT

Entry	Description
RUNTIME_CONNECTOR_TIMEOUT_MSEC=	Connection timeout of the connector clients in milliseconds. Is read by the Connector Stub before each connector function call. Changes are immediately applied by saving **zenAnalyzer.ini**. Default: 300000 (5 minutes)

18. User [USER_LEVELS]

Settings for user authorizations.

These settings must only be set via ZAMS. To do this, use the **Analyzer applications access rights** dialog.

> **Attention**
>
> *Manual changes to these entries in **zenAnalyzer.ini** may lead to the connection to Analyzer Server no longer being possible.*

These entries are written by the license server if it receives a corresponding command. The entries are read when the license server starts. Manual changes to the INI file are only taken into account if the license server service **zrsLicSrv** is restarted.

19. Dedicated users [DEDICATED_USERS]

Settings for dedicated users with a fixed license.
You change these settings in ZAMS using the **Users with fixed license** dialog.

These entries are written by the license server if it receives a corresponding command. The entries are read when the license server starts. Manual changes to the INI file are only taken into account if the license server service **zrsLicSrv** is restarted.

Entry	Description
[DEDICATED_USERS]	Assignment of fixed license to users of an Analyzer Server instance **ZA2**. Configuration is carried out by means of the following entries: ▸ **DEDICATED_USERS_COUNT=**: Number of dedicated users. ▸ **DEDICATED_USER_X=**: Assignment of licenses to user names in consecutive numbering.
DEDICATED_USERS_COUNT=	Number of dedicated users. Example: **DEDICATED_USERS_COUNT=**4 means that dedicated licenses have been given to four users. Default: 0
DEDICATED_USER_X=	Assigns a dedicated license to a user If the value for **DEDICATED_USERS_COUNT=** is 0, this entry is empty. **X** stands for the consecutive numbering of the users. ▸ Minimum: 0 ▸ Maximum: Value from **DEDICATED_USERS_COUNT=** minus 1 Default: (empty)
[DEDICATED_USERS_X]	Configuration for users of an instance **ZA3** or higher. Corresponds to the configuration in **[DEDICATED_USERS]**. **X** is a placeholder for the respective version of the instance. Example: Entries in the **[DEDICATED_USERS_3]** section configure dedicated licenses for users of an Analyzer Server instance **ZA3**.

EXAMPLE

[DEDICATED_USERS 3]

DEDICATED_USERS_COUNT=3

DEDICATED_USER_0=User1

DEDICATED_USER_1=User2

DEDICATED_USER_2=User3

20. Connection to ZA2 [CONNECTION_ZA2]

Entries for the Connector Stubs connection to a Connector Container. These entries cannot be created with a tool. They must therefore be changed manually in the INI file if necessary.

The entries are read if the first Connector function after the SQL Server start that needs a connection with a Connector Conatainer is executed. If these entries are amended, it must be ensured that the Connector Stub uses the new entries. To do this, the SQL-Server instance that is used for **Analyzer 2.xx** must be restarted.

Entry	Description
[CONNECTION_ZA2]	Configuration of the database connection of the Connector Stub components that establish the connection to the Connector Container. These settings only relate to the connection to an Analyzer Server instance ZA2. Connections to other instances are configured by means of the settings in **Connection to ZA3 and higher [CONNECTION_ZAX]** (on page 46).
USER=	User name for the connection. Default: `ReportingUser`
PW=	Password for the connection. The password can be entered as open or encrypted. **Note:** Entry of an encrypted password is not possible via the INI file. Default: `Copa-Data`
SQLINSTANCE=	Denotes the SQL server instance to which the connection is to be made. Default: `Localhost\ZA2`

21. Connection to ZA3 and higher [CONNECTION_ZAX]

Entries for the Connector Stubs connection to a Connector Container. These entries cannot be created with a tool. They must therefore be changed manually in the INI file if necessary.

The entries are read if the first Connector function after the SQL Server start that needs a connection with a Connector Conatainer is executed. If these entries are amended, it must be ensured that the Connector Stub uses the new entries. To do this, the SQL-Server instance that is used for **Analyzer 3.xx** (or higher) must be restarted.

Entry	Description
[CONNECTION_ZAX]	Configuration of the database connection of the Connector Stub components that establish the connection to the Connector Container. These settings only concern the connection to an Analyzer Server instance ZA3 or higher. Connections to instances of version 2.xx are configured using the settings in **Connection to ZA2** [**CONNECTION_ZA2**] (on page 46).
USER=	User name for the connection. Default: `ReportingUser`
PW=	Password for the connection. The password can be entered as open or encrypted. **Note:** Entry of an encrypted password is not possible via the INI file. Default: `Copa-Data`
SQLINSTANCE=	Denotes the SQL server instance to which the connection is to be made. Default: `Localhost\ZA3`

22. Troubleshooting [DEBUG]

Settings for debugging.

These settings can only be changed manually in the INI file.

Parameters	Description
[DEBUG]	Settings for the writing of enhanced LOG entries.
EXTENDEDLOG=	Switches the writing of enhanced log entries off or on: ▸ `0`: off ▸ `1`: on At the time at whch the first log entry is to be written, write protection is still activated. To ensure that the first entry is also written, the license server service **zrsLicSrv** must be restarted. Default: `0`

23. Data preparation

The data preparation is done in several levels. With this data from different sources and formats can be evaluated universally and maintained easily.

- Level 1: Data abstraction (on page 48)
  On the lowest level the data abstraction or data unification is done. It makes sure that the source data are always available in the same format and in the same type for the actual evaluation algorithm.
- Level 2: Compression and calculation (on page 50)
  A level above the actual compression and calculation is done to create the data which should then be displayed in the report. This level is already independent of the data origin and therefore universal.
- Level 3: Report (on page 50)
  The output data of the second level are then displayed graphically in the report as third level. The display in the report in turn is independent of the algorithms necessary for the calculation on the second level. This means that no calculation and no compression is carried out in the report, which exceed the mere display (e.g. formating of local times or similar).

24. Level 1: Data abstraction

At data abstraction there are two different categories of data:

1. Engineering data

   They normally remain the same during the Runtime and are called meta data there.
   The metadata is abstracted or harmonized by the import wizard during import into the database. Regardless of their origin they are available in the format in which they are defined in chapter data structure.

2. Runtime data
   The actual Runtime data are those data which are generally used as the base for all evaluations. They are called user data there.

   Runtime data is tapped via connectors. COPA-DATA provides a Runtime connector and SQL connector with zenon Analyzer. Individual additions can be integrated into the connectors by agreement with COPA-DATA.

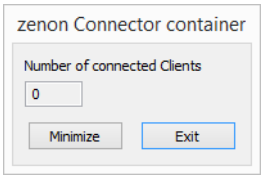
CONNECTOR CONTAINER

The connector container is an application (EXE) which runs at the source system and which loads and executes the connector plug-ins (DLLs). The connector container is a normal user process (no service) which is normally started together with the application which should deliver the data. The connector container opens a TCP port and waits for query requests from the connector stub whereon it loads the requested connector plug-in and invokes the fitting access function for the request. The return data is then sent to the connector stub. Several queries from different TCP connections can be executed in parallel if the source system supports this.

In normal operation the connector container is displayed as icon in the task tray and does not have an own main window. Additional status information can be displayed via a status dialog.

You can read more in the manual for report developers in the Connectors chapter.

DIALOG



Option	Description
Number of connected Clients	Displays the number of clients connected.
Minimize	Minimizes the dialog into the info area of the task bar.
Exit	Closes the connector container.

RESTART

If the connector container has been closed, it can be restarted by:

- Restarting the computer.
- Manual start.
  - From Windows 8: *Task-Manager -> Tab -> Autostart -> Connector-Container -> Open file path-> Double-click on* **zrsConnector.exe**.
  - Other operating systems: *Open file path-> Double-click on* **zrsConnector.exe**.
    32-bit path: %`Program Files (x86)%\Common Files\COPA-DATA\Connectors`

25. Level 2: Compression and calculation

All sorts of compression and calculation of the user data prepared in level 1 (on page 48) is carried out in the **Stored Procedures**. If necessary, filter criteria are handed over to them via parameters.

The **stored procedures** are independent of the format of the user data and of the visual display of the result. They contain only the calculation algorithms and the filter methods with regards to the meta data.

So far as it is technical feasible, they are also independent of specific presumptions concerning the meta data; i.e. independent of specific variable names. If this is not possible, the allocation to these fixed meta data parts is implemented as an obvious block at the beginning of the **stored procedures** in order to separate project-specific and universal evaluation part.

26. Level 3: Report

The result data generated in level 2 (on page 50) are formatted graphically in an SQL Server 2016 Reporting Services report. There is no calculation in the report itself. Also a direct access to database tables is never done but only to the **stored procedures** from level 2 (on page 50). With this the reports are:

- completely independent of the database structure
- universal and
- interchangeable