zenon
by COPA-DATA

# zenon Analyzer manual

## ZAMS - zenon Analyzer Management Studio

v.3.40

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# 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.

## 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.

# 2 ZAMS - zenon Analyzer Management Studio

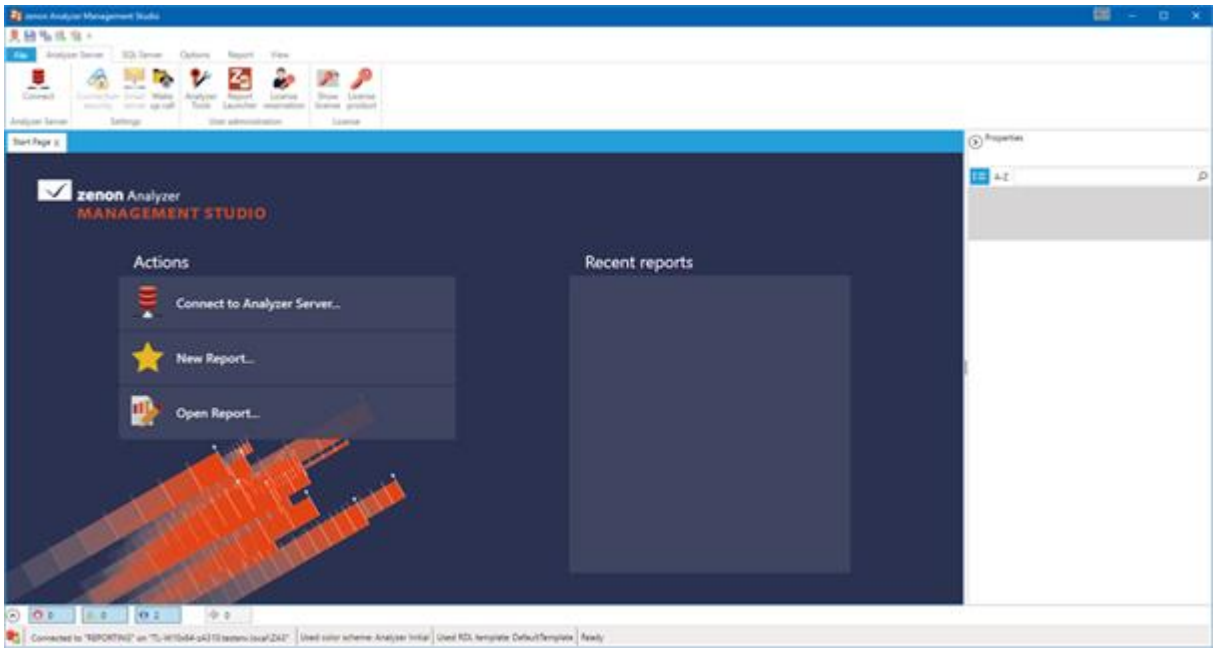
In zenon Analyzer Management Studio (ZAMS), you provide the reports that are called up, configured and displayed by users in Report Launcher.
You also start the external tools here:

- **Manual (on page 495) Data Editor**
- **Metadata Editor** (on page 447)
- **Migration Tool** (on page 651)
- **Prediction Model Manager** (on page 531)

ZAMS is the main application for:

- Configuration of zenon Analyzer
- Creation of reports from the report templates supplied with COPA-DATA
- Creation, editing and deleting report subscriptions and the attendant schedules on the Analyzer server
- The creation and deletion of linked servers in the SQL server instance of the Analyzer server
- Editing of metadata databases

- The migration of databases, reports and subscriptions




### Information

ZAMS is started in the language of the operating system. If this language is not implemented in ZAMS or the corresponding language file is missing, ZAMS is started in English. You can read details on the languages in the Language settings (on page 47) chapter.

## COMMUNICATION

ZAMS communicates with the Analyzer database using the Microsoft SQL Server 2016 Management Objects. It connects itself:

- To the SQL Server 2016 Reporting Service Web Service endpoint **ReportService 2016** of the Analyzer server
- to the selected database on the Analyzer server
- To **zrsLicSrv** on the Analyzer server

## SOFTWARE REQUIREMENTS

The following software is required for the use of ZAMS:

- **Microsoft .NET Framework 4.6.2**
  This must already be present on the computer before the installation of ZAMS.

### ERROR HANDLING

Error messages, warnings and messages are saved in the output window (on page 69), in accordance with the options (on page 46) that have been set.

# 3 Starting ZAMS

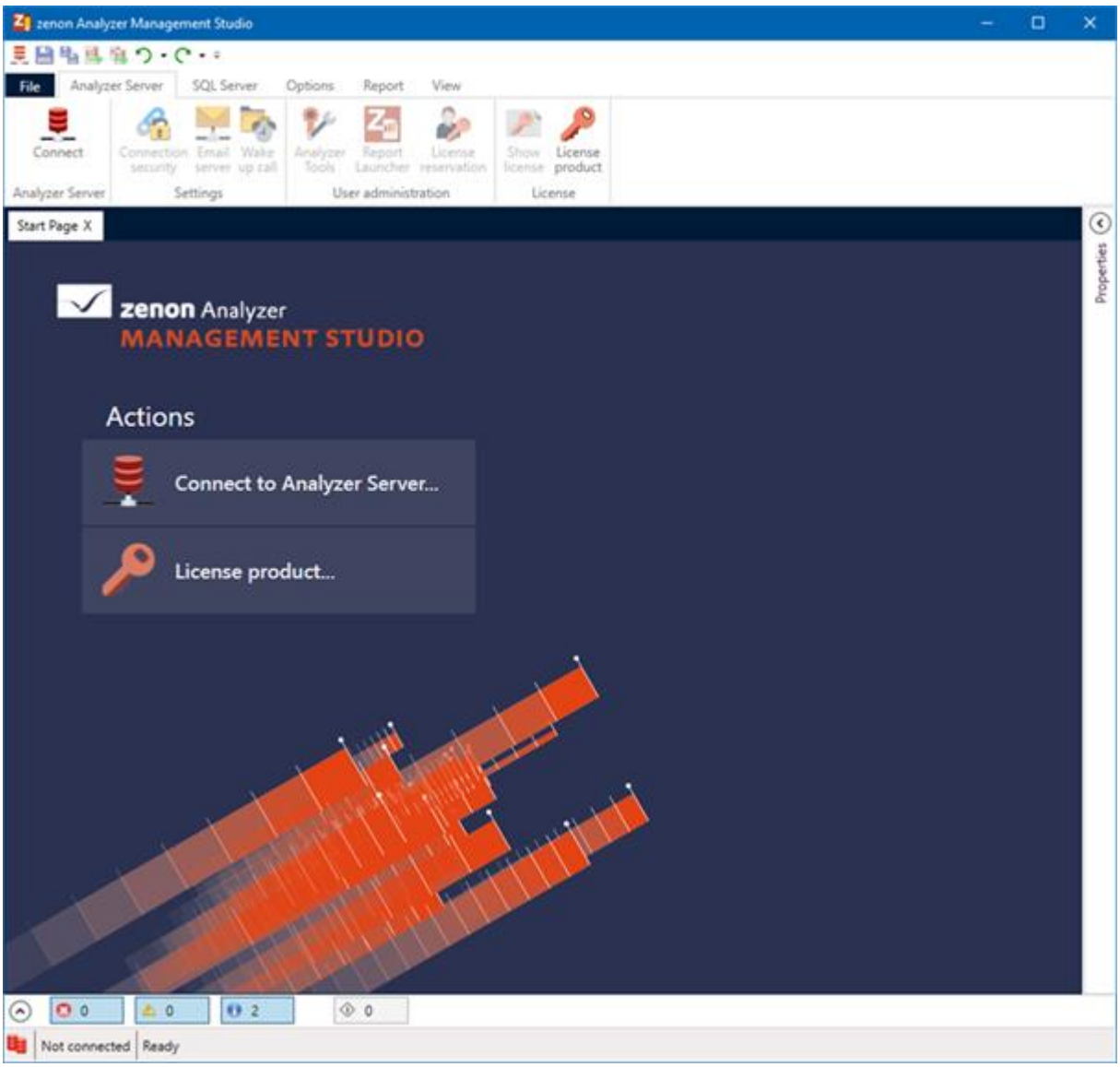
The zenon Analyzer Management Studio (ZAMS) is installed together with zenon Analyzer.

During installation, the user who carries out the setup is entered as a user with dedicated license (on page 427) with authorization level *3* (on page 414).

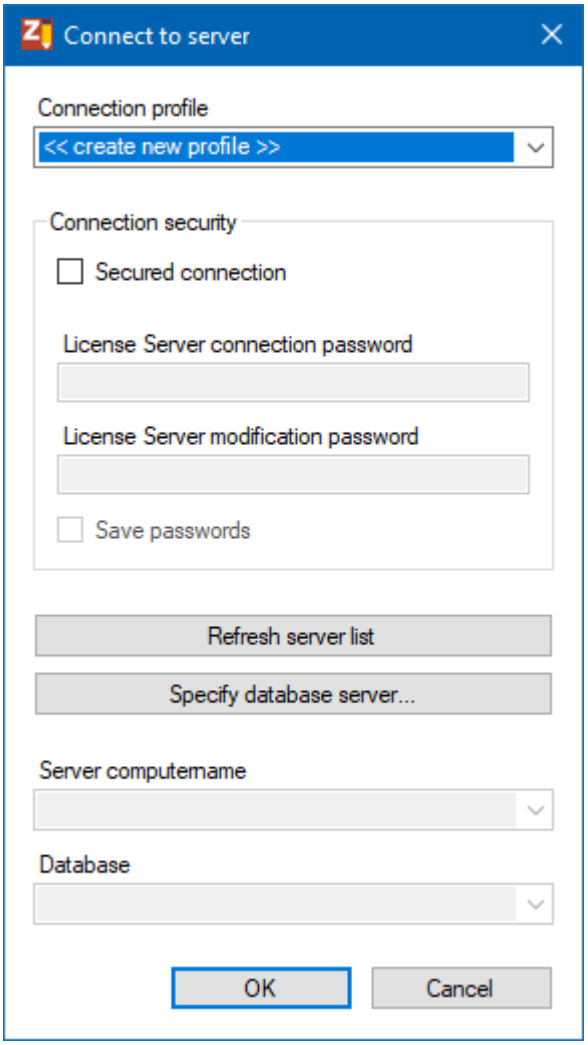
To start ZAMS:

1. In the Windows Start menu, select the **COPA-DATA -> ZAMS** entry
   or
   double click on a ZAMS report file (**.zams_rep**)

Starting ZAMS



2. The connection dialog is opened, depending on the setting in the Options (on page 36). If it is not shown, it can be started by clicking on **Connect to Analyzer server**:




3. Select the desired connection by clicking on **Connection profile** or create a new connection (on page 75)
4. Click on OK:
   - The connection test is carried out.
   - The database structure is checked and the license is validated.
   - the connection will be established.

   Note: A progress bar for each is shown if necessary.

   ZAMS is ready for the configuration of reports.

**Note:** If the connection fails due to a missing license, you can start **License Manager** and activate or assign a license. Presettings for connection profiles, deployment of reports and messages in the output window can be set in the options (on page 36) in the **File** menu.

### ACCEPTANCE OF THE CONFIGURATION FROM A PREVIOUS VERSION

When a new version of ZAMS is started, provided there are not yet any configuration files available, the configuration of the prior versions is used. To do this, its configuration files must still be present on the computer. The transfer happens separately for each user.

# 4 Example of configuration

A company wants to use zenon Analyzer. The following computers are available in the company network:

- The Analyzer server, called **SRV**
- An engineering station, called **ENG**

Both are in the **TEST** domain. There are the following users in the domain:

- **TEST\Admin**: Network administrator.
  Only this user can install programs on computers. This user should have access to the Analyzer as an administrator, however not permanently have a license.
- **TEST\ZamsAdmin**: This user is the future Analyzer administrator.
  They should be able to use all Analyzer applications and be able to complete all administrative tasks on the Analyzer with ZAMS. A license should be reserved for this user.
- **TEST\ReportViewer1**, **TEST\ReportViewer2** and **TEST\ReportViewer3**: These three users should evaluate reports in the Analyzer and be able to execute them, however a license should not be assigned to any of these users permanently.

### CONFIGURATION

1. **TEST\Admin** executes the Analyzer server setup on the computer called **SRV**. Once the setup has been completed, this user is entered as a user with dedicated license (on page 427) with authorization level *3* on the license server. They have administration rights in both the SQL server instance and Report Launcher. No other user has access rights to the Analyzer.
2. The user **TEST\Admin** ensures that the dongle is connected to the computer **SRV** and activates the dongle license with the **License Manager**.
3. **TEST\Admin** executes the ZAMS setup on the computer called **ENG**.
4. **TEST\Admin** starts the ZAMS on the computer called **ENG**. The connection to the server **SRV\ZA3** and on this server to the database **ZA_DATA** is established. When establishing a connection, ZAMS detects that the user **TEST\Admin** has the authorization level 3 and that a license for them could be established.
5. The user **TEST\Admin**

a) Starts the administration of the access rights to the Analyzer applications (on page 430) in ZAMS

b) Adds the user **TEST\ZamsAdmin**

c) Assigns the highest possible access right to this

d) Confirms the dialog with **OK**.

6. The user **TEST\Admin**

a) Starts the administration of the Report Launcher access rights (on page 435) in ZAMS

b) Adds the user **TEST\ZamsAdmin** as an administrator for the configuration of system access rights

c) Adds the same user for the object access rights of the root folder

d) Sets its access rights there to **content manager**

e) Confirms the dialog with **OK**.

7. The user **TEST\Admin** closes ZAMS and logs off from the **ENG** computer.

8. The user **TEST\ZamsAdmin** logs on to the **ENG** computer and starts ZAMS. The connection to the server **SRV\ZA3** and on this server to the database **ZA_DATA** is established. When establishing a connection, ZAMS detects that the user **TEST\ZamsAdmin** has the authorization level *3* and that a license for them could be established.

9. The user **TEST\ZamsAdmin**

a) Starts the administration of users with a dedicated license in ZAMS

b) Adds itself

c) Removes the user **TEST\Admin** from the list

d) Closes the dialog.

10. The user **TEST\ZamsAdmin**

a) Starts the administration of the access rights in ZAMS for the Report Launcher

b) Adds the three users **TEST\ReportViewer1**, **TEST\ReportViewer2** and **TEST\ReportViewer3** as a user for the configuration of the system access rights (on page 436)

c) Adds the same three users for the object access rights (on page 439) of the root folder

d) Leaves its access rights there on the **browser**

e) Confirms the dialog with **OK**.

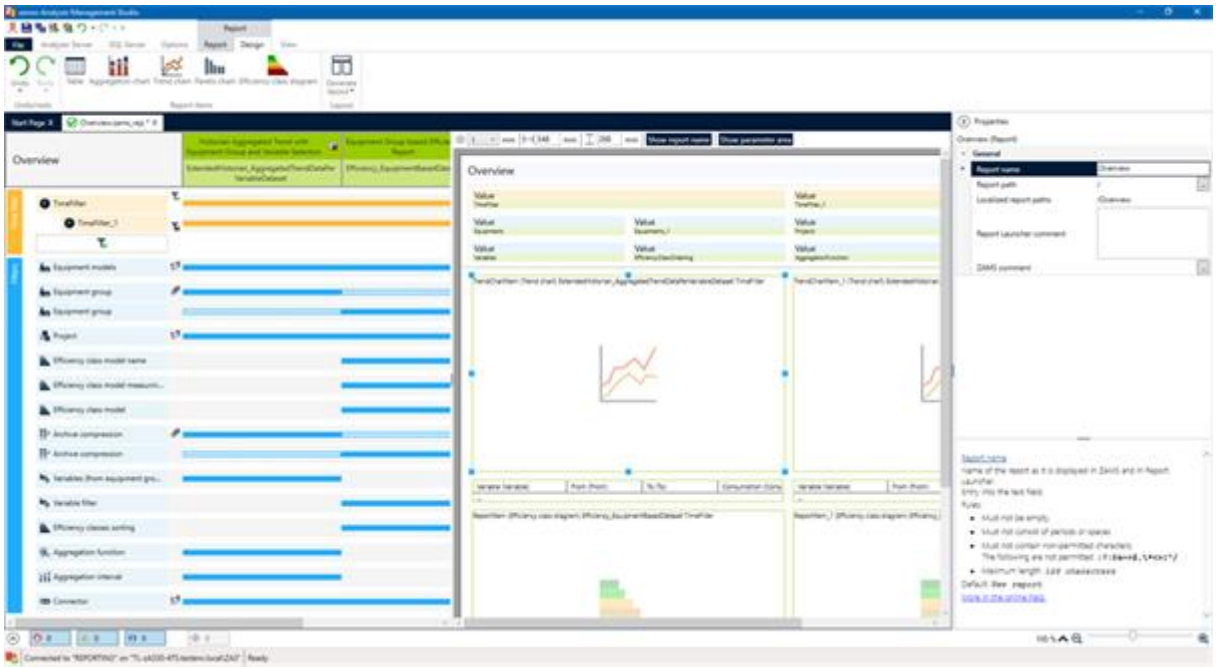
The configuration was carried out successfully.

# 5 Checklist for license problems

If ZAMS cannot establish a connection or the connection is broken due to problems with the license, check the following:

- Can the dongle be accessed from the Analyzer Server?
- Is the license activated and assigned to the zenon Analyzer?
- Is the TCP port *50779* open on the Analyzer Server?
- Can the license client communicate with the license server?
  **Note:** Firewalls or network failures, for example, may prevent this.
- Does the user have the required authorization levels?
- Is a license available for the user?
  **Note:** Users with a dedicated license are assigned licenses even if they are not connected.
- Is the report template or the report included in the scope of the license?

# 6 User interface



The user interface of the ZAMS consists of:

- **Menus**, **ribbons** and **tool bars**:
  These contain elements that allow access to actions and commands.
  The following are available:

- Menu **File** (on page 20)
- **Ribbons (on page 20)**
- Toolbar **quick access** (on page 24)

- **Main window** (on page 55):
  Can contain several pages. Each page has a tab. Navigate by clicking on the respective tab. The pages can be closed by clicking on the **X** tab.
  - **Start page:** (on page 55) Page that is opened when starting.
  - **Report pages** (on page 57): Pages to display and configure reports. Each report is shown and configured on its own page.
    Each report page contains:
    - Symbol in tab of whether the report could be correctly validated.
    - Area to administer the data sources and filter settings.
    - Design area for the graphic configuration of reports.
- **Properties window** (on page 67):
  Configuration of the report settings. This window can be hidden.
- **Embedded Help** (on page 67):
  Display of brief help for the properties to be configured.
- **Output window** (on page 69):
  Shows errors, warnings, messages and status messages.
  The window can be hidden.
- **Status line** (on page 71):
  Shows notices in relation to connections, reports and actions.
- **Dividing lines**:
  Make it possible to amend the size ratio between individual areas.

When ending ZAMS, the positions and sizes of the windows and the open/closed status. as well as the positions of the dividing line are saved.

**Note:** The **Default Layout** (on page 35) action in the **Display** ribbon can be used to reset the display of the user interface to the default status.

## AVAILABILITY

Whether an entry and the corresponding symbol are active or not depends on these factors:

- Has a connection been established and does it have a valid license?
- If reports have been opened and is the currently-active report write protected?
- Is there currently an action running in a background thread (such as **Prepare**, **Open in Report Builder**)?

- Configuration of the connection security or the e-mail server: ZAMS must run in the same computer as Analyzer Server.

For this, the following applies: A factor is only considered if all superordinate factors see the entry as active.

If an action that can change the connection or license status is to be executed, all reports are closed beforehand. The user is notified of this and can cancel closing. The action is not executed if it is not possible to close all reports.

### PROGRESS BAR

Operations in ZAMS are visualized by means of progress bars:

- Step display: Processes in several steps are shown by a corresponding display with information about the individual steps.
- Progress bar: If operations in ZAMS last for longer than 2 seconds and no progress bar is available, a general progress bar is shown in the form of a loading progress bar.

## 6.1 Menus and ribbons

Navigation in ZAMS is organized using menus and ribbons.
The following menus and ribbons are available:

**Menu:**

- File (on page 22)

Ribbons:

- Analyzer Server (on page 25)
- SQL Server (on page 27)
- Options (on page 29)
- Report (on page 30)
- Design (on page 32) (only available if a report window is in focus.)
- View (on page 35)

### STRUCTURE OF 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 group:
  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.

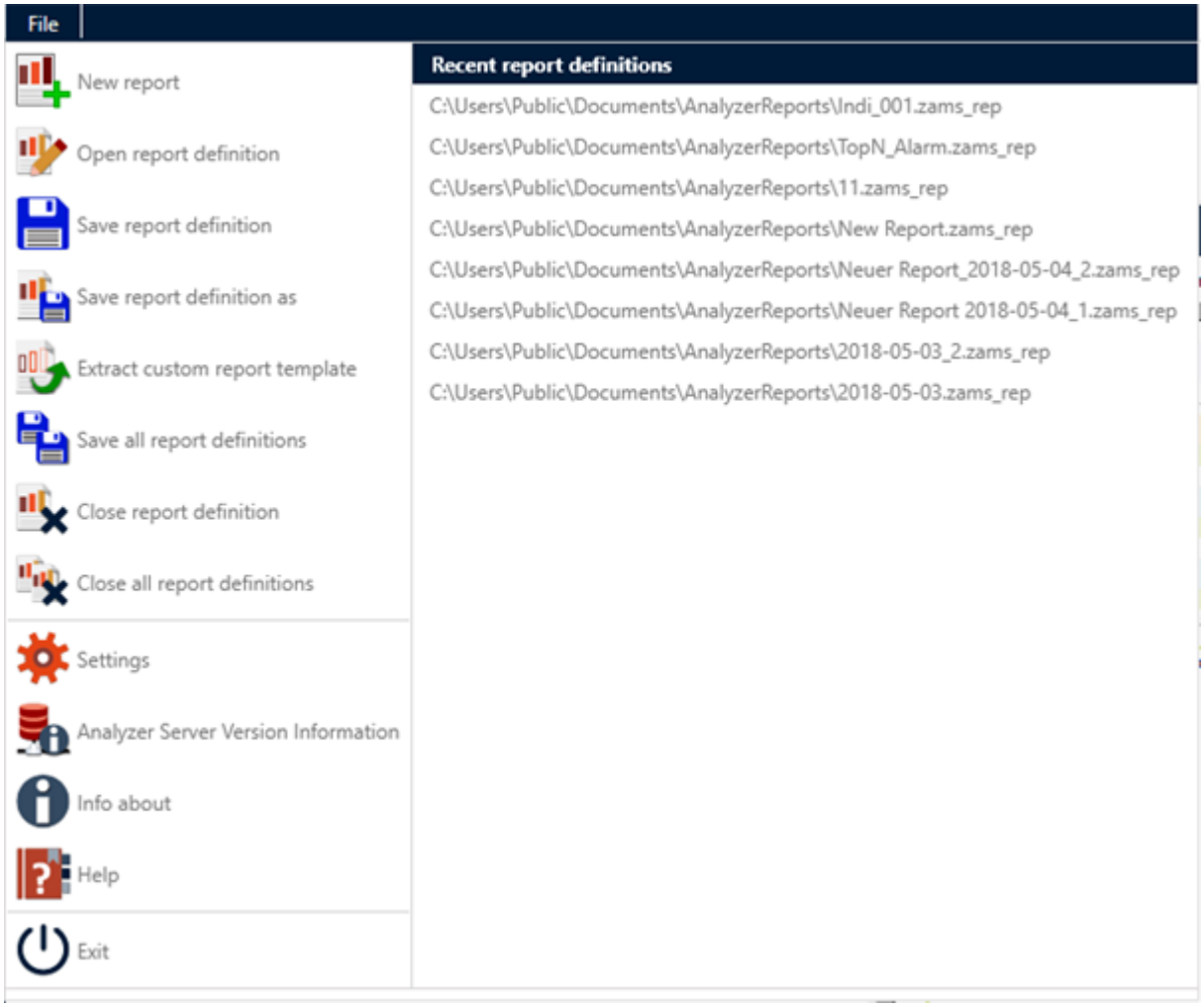
Ribbons can be hidden or displayed again using the **Minimize ribbon / restore ribbon** in the **Quick access** toolbar. Hiding is possible by double-clicking on the tab of a Ribbon.

### EXAMPLE OF SQL SERVER RIBBON

- **Tab**: SQL Server
- Ribbon **group**:
  - **Database**
  - **Database backup**
  - **Administration**
  - **Data processing**
- **Default 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**

### 6.1.1 File

The File menu contains a list of general actions and a list of reports that were edited last.




## ACTIONS

| Action | Description |
|---|---|
| **New report** | Opens a new window to create a report and sets the focus on the **Report** (on page 30). |
| **Open report definition** | Opens a new report window to select an existing report or to create a new report. |
| **Save report definition** | Saves the report of the window that is in focus. |
| **Save report definition as** | Saves the report of the window that is in focus under a different name. |

| Action | Description |
|---|---|
| **Extract custom report template** | Extracts the active report template and creates a custom report template. The **custom themes** dialog is opened to do this. For details, see also the **Create customer report template** chapter. |
| **Save all report definitions** | Saves all opened report definitions. |
| **Close report** | Closes the active report that is currently active.<br>Shortcut: **Ctrl+F4**<br>**Note:** Only one report window can be closed with the keyboard shortcut. The start window can be closed by clicking on the X button. |
| **Close all reports** | Closes all opened reports.<br>Shortcut: **Ctrl+Shift+F4**: |
| **Settings** | Opens the dialog (on page 36) with the settings for:<br>▸ Connection profiles<br>▸ Deployment<br>▸ Output messages<br>▸ Language settings<br>▸ Database backups |
| **Analyzer Server Version Information** | Opens window with information on:<br>▸ Version of the operating system<br>▸ Version of zenon Analyzer |
| **Info about** | Opens window with information on the ZAMS version. |
| **Help** | Opens online help.<br>Shortcut: **F1** |
| **Close** | Exits ZAMS. |

## LIST OF REPORTS

This list shows th reports that were last edited, sorted according to last use with the most recent report in the top position.

The number of reports in the list is established in the **Settings** in the Connection profiles (on page 37) tab in the **Maximum number of reports in history**.

### 6.1.2 Fast access

The ribbon contains 5 pre-defined actions and a configuration menu. These actions cannot be amended individually.
The tool bar for quick access can be displayed either above or below the ribbons.

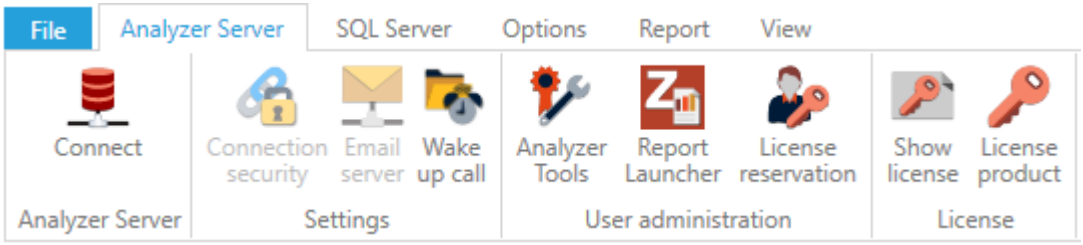
#### STANDARD ASSIGNMENT

| Action | Description |
|---|---|
| **Connect to Analyzer server** | Opens the dialog with the connection profiles (on page 75). |
| **Save report definition** | Saves the report that is in focus. |
| **Save all report definitions** | Saves all opened report definitions. |
| **Deploy report** | Allows the deployment of the active report.<br>Only available if there are no validation errors. Validation errors are shown in a tooltip. |
| **Deploy all reports** | Allows the deployment of all opened reports.<br>Only available if there are no validation errors. Validation errors are shown in a tooltip. |
| **Undo** | Makes it possible to undo an action in the configuration. Clicking on the symbol undoes the last action. Clicking on the arrow opens the drop-down list with the number of steps.<br>Actions in dialog windows cannot be undone. |
| **Restore** | Makes it possible to restore actions that have been undone. Clicking on the symbol restores the last action that has been undone. Clicking on the arrow opens the drop-down list with the number of steps.<br>The button is not available if:<br>▸ at least 1 step has been undone<br>▸ no action has been carried out in the report configuration since the undo |

| Action | Description |
|---|---|
| **Configuration menu:**<br>**Edit symbol bar for quick access** | Allows the amendment of the display of the toolbar and the ribbon:<br>▸ **Customize Quick access toolbar**:<br>Not currently available.<br>▸ **Show below the** ribbon:<br>Shows the tool bar for quick access under the ribbon.<br>▸ **Minimize ribbon/restore ribbon:**<br>Hides or shows ribbons. Hiding is possible by double-clicking on the tab of a Ribbon. |

## 6.1.3 Analyzer Server

The ribbon contains actions for the Analyzer Server.




## ACTIONS

### ANALYZER SERVER

Connection to the Analyzer server.

| Action | Description |
|---|---|
| **Connect** | Opens dialog with connection profiles (on page 75). |

### SETTINGS

Settings on the Analyzer server

| Action | Description |
|---|---|
| **Connection security** | Opens the dialog (on page 79) for configuration of the connection security.<br>**Note:** This function is only available if ZAMS is running |

| Action | Description |
|---|---|
| | on the Analyzer server and is connected to an Analyzer database with a valid license on the same computer and there is no other task running in the background. |
| **Email server** | Opens the dialog to **configure an email server** (on page 92).<br><br>**Note:** This function is only available if ZAMS is running on the Analyzer server and is connected to an Analyzer database with a valid license on the same computer and there is no other task running in the background. |
| **Wake up call** | Opens the dialog (on page 91) for configuring a wake up call.<br><br>This initializes the reporting services and prevents the cache being emptied. This periodic call up can shorten the waiting time when calling up Report Launcher and when connecting ZAMS and the **Migration Tool**. |

### USER ADMINISTRATION

Configuration of the user and their rights.

| Action | Description |
|---|---|
| **Analyzer Tools** | Opens dialog to administer the access rights to the Analyzer tools (on page 430). |
| **Report Launcher** | Opens dialog to administer the access rights to the objects in the Report Launcher (on page 435). |
| **License reservation** | Opens dialog to administer the users with a dedicated license (on page 427). |

### LICENSE

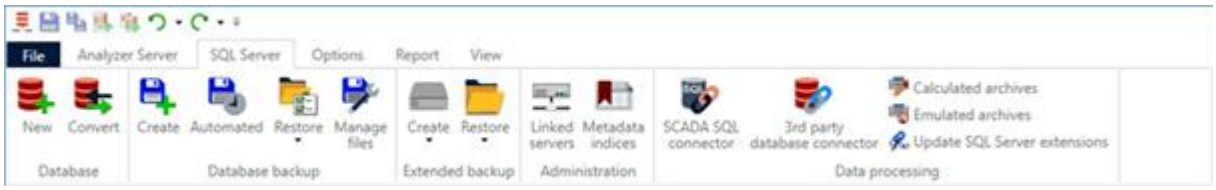
Display and configuration of the licenses.

| Action | Description |
|---|---|
| **Show license** | Opens dialog (on page 90) with information about the current license:<br>▸ Serial number<br>▸ License status |

| Action | Description |
|---|---|
| | ▸ Licensed report themes |
| **License product** | Opens the wizard/dialog of the **License Manager**. |

## 6.1.4 SQL Server

The ribbon contains actions for SQL Server.




### ACTIONS

#### DATABASE

Create and convert databases.

| Action | Description |
|---|---|
| **New** | Opens dialog (on page 180) to create a new Analyzer database. |
| **Convert** | Starts the conversion (on page 182) of databases, the version number of which is lower than the current version number. |

#### DATABASE BACKUP

Backup and restore databases.

| Action | Description |
|---|---|
| **Create** | Opens the dialog (on page 220) for creating a project backup. |
| **Automated** | Opens the dialog (on page 230) to administer the automatically-created database backups. |
| **Restore** | Contains actions to:<br>▸ **Restore**:<br>Opens the dialog (on page 224) for renaming a profile.<br>▸ **Restore as new database**: |

| Action | Description |
|---|---|
| | Opens the dialog (on page 227) for restoring a database backup as a new database.<br>▸ **Restore Reporting Services database**: Opens the dialog (on page 229) for restoring the reporting services database. |
| **Manage files** | Opens the dialog (on page 250) to administer the backup files of the database. |

### ENHANCED BACKUP

Backup and restore databases and reports individually.

| Action | Description |
|---|---|
| **Create** | Selection of enhanced backup for reports or complete backups. Clicking on the respective button opens the dialog (on page 254) to create the enhanced backup. |
| **Restore** | Selection of the restoring of reports or complete backups. Clicking on the respective button opens the dialog (on page 254) to restore the enhanced backup. |

### ADMINISTRATION

Administration tasks.

| Action | Description |
|---|---|
| **Linked Server** | Opens dialog (on page 186) to manage the linked servers. |
| **Metadata indices** | Opens the dialog (on page 195) to manage the metadata indices. |

### DATA PROCESSING

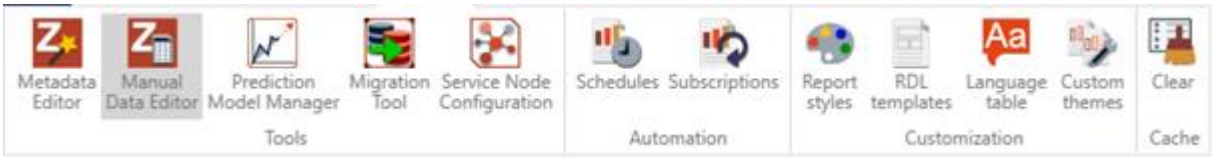
Configuration of connectors and archives.

| Action | Description |
|---|---|
| **SCADA SQL-Connector** | Opens the dialog (on page 126) to create an SQL connector. |
| **3rd party database connector** | Starts the configuration (on page 145) of the connector for third-party databases. |
| **Calculated archives** | Starts the dialog (on page 403) to configure calculated |

| Action | Description |
|---|---|
| | archives. |
| **Emulated archives** | Opens the dialog for configuring the archive emulation (on page 370). |
| **Update SQL Server extensions** | Renews the SQL server extensions (on page 125). The result is displayed in the output window. |

## 6.1.5 Options

The ribbon contains actions for the options.




### ACTIONS

#### TOOLS

Editors and tools.

| Action | Description |
|---|---|
| **Metadata Editor** (on page 447) | Allows you to amend visual names and descriptions, to enter equipment information and to create efficiency class models. |
| **Manual Data Editor** (on page 495) | Allows the editing of tables for price and standard values in a zenon Analyzer metadata database, as well as the administration of degree day figures. |
| **Prediction Model Manager** | Allows the creation, maintenance and administration of prediction models. The results of the prediction models are used in predictive analytics reports. |
| **Migration Tool** (on page 651) | Allows the migration of the Analyzer Server. |
| **Service Node Interface** | Opens the dialog to configure the **Service Node** and the Analyzer objects that are thus available in the **Service Grid** (on page 588). |

### AUTOMATION

Automation by means of schedules and subscriptions.

| Action | Description |
|---|---|
| **Schedules** | Opens dialog to manage schedules (on page 102) for the distribution of reports. |
| **Subscriptions** | Opens dialog to manage report subscriptions (on page 112). |

### ADJUSTMENT

Amendment of colors, language, templates and report themes.

| Action | Description |
|---|---|
| **Report styles** (on page 261) | Opens the dialog (on page 261) to create and edit and administer report styles. |
| **RDL templates** (on page 199) | Opens the dialog to administer RDL templates. |
| **Language Table** (on page 348) | Opens the dialog to configure the language table. |
| **Custom themes** | Opens the dialog to create and administer custom themes and report templates. |

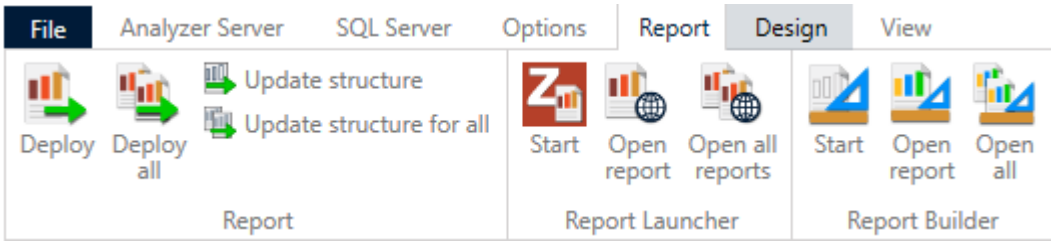
### CACHE

Operations for the cache.

| Action | Description |
|---|---|
| **Delete** | Updates (on page 346) the ZAMS cache. |

## 6.1.6 Report

The ribbon contains actions for the creation, editing and administration of reports.



# ACTIONS

## REPORT

Commands in the **Report** ribbon group:

| Action | Description |
|---|---|
| **Deploy** | Allows the deployment of the active report.<br>Only available if there are no validation errors. Validation errors are shown in a tooltip. |
| **Deploy all** | Allows the deployment of all opened reports.<br>Only available if there are no validation errors. Validation errors are shown in a tooltip. |
| **Update structure** | Provides the active report and retains the current layout in the process. All report elements, as well as headers and footers are retained.<br>Only available if there are no validation errors. Validation errors are shown in a tooltip. |
| **Update structure for all** | Provides all opened reports and retains the current layout in the process. All report elements, as well as headers and footers are retained.<br>Only available if there are no validation errors. Validation errors are shown in a tooltip. |

## CD_REPORTLAUNCHER>

Report Launcher - starts and opens reports.

| Action | Description |
|---|---|
| **Start** | Opens the Report Launcher.<br>When starting the Report Launcher or opening reports in the Report Launcher, Internet Explorer is addressed by ZAMS directly as ActiveX. |
| **Open report** | Opens the report currently displayed in ZAMS in the Report Launcher. |
| **Open all reports** | Opens all reports currently open in ZAMS in the Report Launcher. |

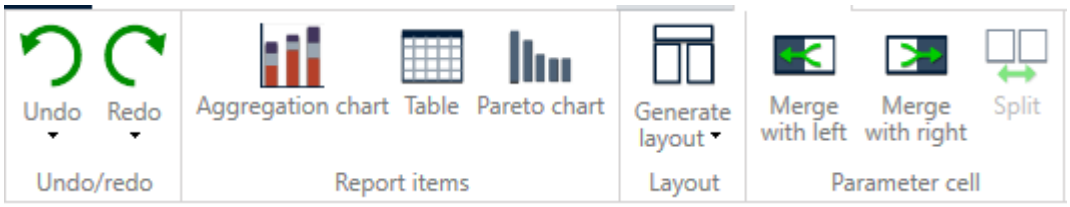
### REPORT BUILDER

Start Microsoft Report Builder and open reports. The Report Builder must already be present on the system for this.
Note: The Report Builder is also installed for ZAMS. In the Report Launcher, the Report Builder can be downloaded from the Microsoft website using a button in the main directory.

| Action | Description |
|---|---|
| **Start** | Opens the Microsoft Report Builder. |
| **Open report** | Opens the active report in Microsoft Report Builder.<br>**Note:** The Report Builder was only started if the report can be found on the server. |
| **Open all** | Opens all opened reports in Microsoft Report Builder.<br>**Note:** The Report Builder is only started for reports that can be found on the server.<br>**Attention:** For each report to be opened, a separate Report Builder instance is opened for each language variant. If more than 10 instances are to be opened, a warning is shown and a dialog is shown, in which the opening process can be canceled. |

## 6.1.7 Design

The ribbon contains actions for the design of reports.




Areas are available for:

- Undoing/restoring actions
- Adding report elements
- Layout
- The parameter area
- The parameter area cell

**Note:** Is only shown if reports are displayed. The actions that are offered depend on the selected report template, the configuration status of the report and the position of the insertion point in the design area.

## ACTIONS

### UNDO/REDO

Actions to insert report elements:

| Action | Description |
|---|---|
| **Undo** | Makes it possible to undo an action in the configuration. Clicking on the symbol undoes the last action. Clicking on the arrow opens the drop-down list with the number of steps.<br><br>Actions in dialog windows cannot be undone. |
| **Redo** | Makes it possible to restore actions that have been undone. Clicking on the symbol restores the last action that has been undone. Clicking on the arrow opens the drop-down list with the number of steps.<br><br>The button is not available if:<br>▸ at least 1 step has been undone<br>▸ no action has been carried out in the report configuration since the undo |

### REPORT ITEMS

Actions to insert report elements:

| Action | Description |
|---|---|
| **Table** | Adds a table to the design area.<br>When inserting, a dialog for selection and configuration is opened.<br>The table types that are available depend on the report template. |
| **Diagram** | Selection of a diagram.<br>A dialog for configuration is opened during insertion.<br><br>The diagram types that are available depend on the report template. |

### LAYOUT

Only available if a report has been selected, there is a report template and no validation errors have occurred.
Contains actions for the configuration of the layout:

| Action | Description |
|---|---|
| **Generate layout** | Adds a standard layout to the design area.<br>Clicking on the symbol creates all elements for the complete report. Corresponds to the **Complete report** detail selection.<br>Clicking on the arrow key opens a drop-down list to select the desired action:<br>▸ **Parameter area and report name**<br>▸ **Report body**<br>▸ **Entire report** |

### PARAMETER AREA

Actions for the parameter area.
Are shown when an empty parameter area is clicked in.

| Action | Description |
|---|---|
| **Add new column** | Adds a new column if there is sufficient space. |
| **Add new row** | Adds a new row if there is sufficient space. |
| **Delete last column** | Deletes the column furthest right.<br>Requirements:<br>▸ None of the cells in this column can be linked to a cell in the neighboring column.<br>▸ No cell in this column can be configured. |
| **Delete last row** | Deletes the lowest row.<br>Requirement: No cell in this row can be configured. |

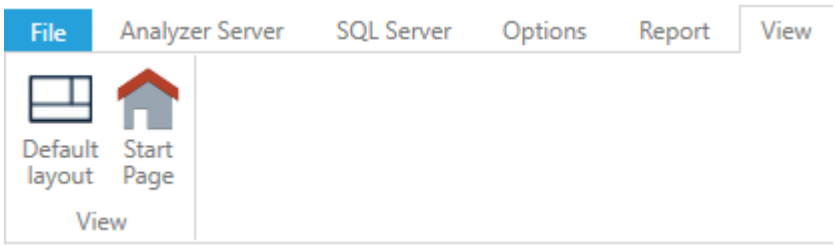
### PARAMETER AREA CELL

Actions for cells in the parameter area.
Are shown when clicking on an element in the parameter area.

| Action | Description |
|---|---|
| **Merge with left** | Connects the selected cell to the cell to the left of it. The report parameters of the seconds cell are overwritten. |
| **Merge with right** | Connects the selected cell to the cell to the right of it. The report parameters of the seconds cell are overwritten. |
| **Split** | Splits a connected cell to their original cells. The cell on the far left contains the configured report parameters. The newly-created cells remain empty. |

## 6.1.8 View

The ribbon contains actions for the display of ZAMS.




### ACTIONS

#### VIEW

Layout and start page.

| Action | Description |
|---|---|
| **Default layout** | Resets the configuration of the ZAMS user interface to the default status.<br>The following are reset:<br>▸ Dialogs, the size of which can be changed and/or can be moved<br>▸ The window size<br>▸ Column widths too, depending on the dialog<br>▸ Settings for separators<br>▸ Expanded states |

| Action | Description |
| --- | --- |
| **Start Page** | Opens the start page (on page 55). |

## 6.2 Settings

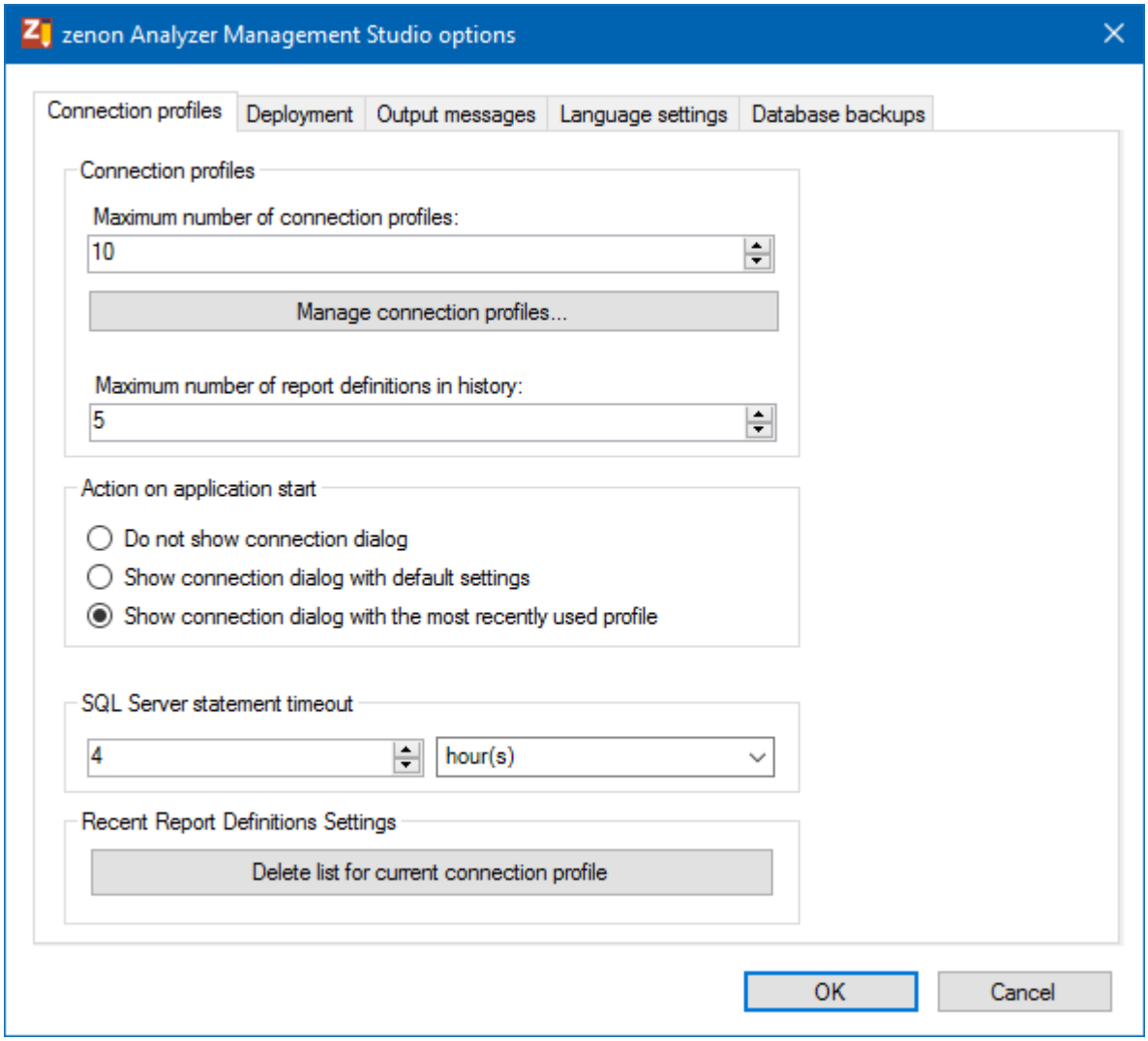
You can get to the settings for ZAMS via the entry **Settings** in the **File** menu. They are available regardless of whether there is a connection to the Analyzer server and regardless of whether there is a valid license. The settings are deactivated if one of the following actions is executed: **Open**, **Deploy**, **Deploy all**, **Open in Microsoft Report Builder** or **Open all in Microsoft Report Builder**.

The following are configured in the settings:

- **Connection profiles (on page 37)**
- Deployment of reports (on page 42)
- Messages in the output window (on page 46)
- Language settings (on page 47)
- Database backups (on page 51)

## 6.2.1 Connection profiles

In this tab, you define the starting behavior of the ZAMS.




| Option | Description |
|---|---|
| **Connection profiles** | Settings for connection profiles. |
| **Maximum number of connection profiles** | Number of connection profiles that are saved. If the set number is exceeded by the creation of a new connection profile, then the profile that has not been used the longest is deleted.<br><br>Entry in the field or configuration using the arrow keys.<br><br>▸ Minimum: 1<br>▸ Maximum: 255 |

| Option | Description |
|---|---|
| **Manage connection profiles** | Opens the dialog (on page 39) to manage the connection profiles. |
| **Maximum number of report definitions in history:** | Number of report definitions that are displayed in the **File** menu in the list of **Most recently edited report definitions** list.<br>▸ Minimum: *0* (no report is displayed)<br>▸ Maximum: *255*<br>If the permitted maximum is exceeded by a report that is being added, the oldest entry is deleted.<br>Default: *3*<br>This value applies for all connection profiles. The new maximum is written to the configuration by clicking on **OK**. All connection profiles are immediately checked for adherence to the maximum. The oldest entries are deleted if necessary.<br>Entries can be removed from the list using the **x** button. The removal of an entry is automatically offered if a report definition is selected from the list to be opened and this is no longer available in the save path. The list can also be deleted in full. |
| **Action on application start** | Defines the action carried out when the ZAMS is started. |
| **Hide connection dialog** | *Active*: Only the main window is shown. |
| **Show connection dialog with default settings** | *Active*: The dialog for establishing the connection is opened with the values for a new connection profile. |
| **Show connection dialog with the most recently used profile** | *Active*: The dialog for establishing the connection is opened with the values for the most recently used connection profile. |
| **SQL Server statement timeout** | Entry of the SQL server statement timeout.<br>This timeout enters into force if an individual SQL Statement runs for longer than is defined here, for example when backing up or when restoring a |

| Option | Description |
|---|---|
| | large database. With new connections, the currently-set value is used for the Timeout. If this is amended in the options, the existing connections are amended to the new value.<br><br>The Timeout can be set to a value between *1* minute and *7* days.<br><br>**Input elements:**<br><br>▸ Number element:<br>Entry of the quantity in the field directly or by means of the arrow keys.<br>Possible values for :<br>- days: *1 - 7*<br>- hours: *1 - 168*<br>- minutes: *1 - 10080*<br><br>▸ Drop-down list for granularity:<br>Possible values:<br>- minutes<br>- hours<br>- *days*<br>This selection influences the value range of the number element.<br><br>Default:*4 hours* |
| **Delete list for current connection profile** | Clicking on the button deletes the list of the last-used report definitions for the current connection on the start page. A request to confirm this action is made before it is deleted. |
| **OK** | Applies all changes in all tabs and closes the dialog. |
| **Cancel** | Discards all changes in all tabs and closes the dialog. |

### 6.2.1.1 Manage connection profiles

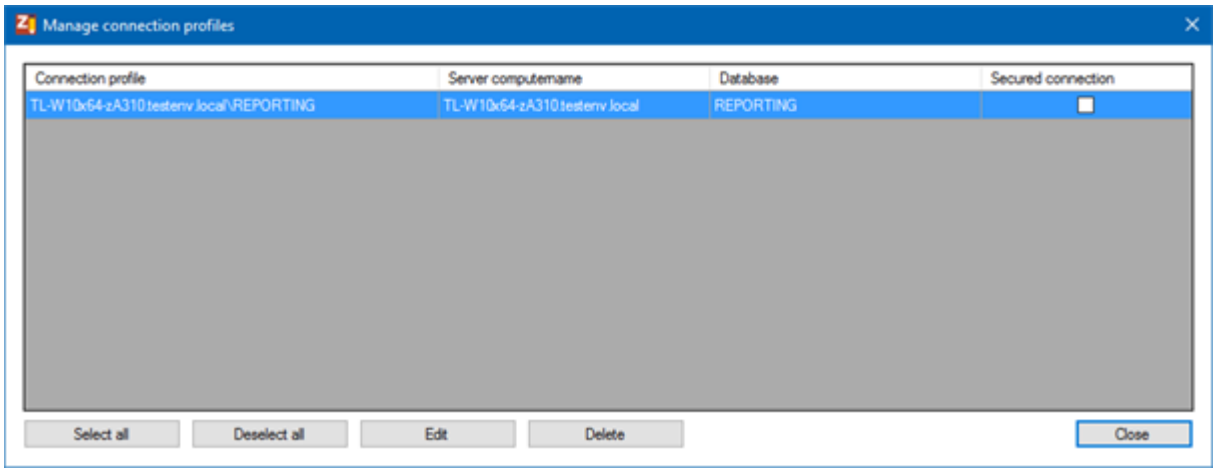
Connection profiles are administered in their own dialog. It can be deleted and edited. The structure and the configuration are identical for:

- **ZAMS** (on page 75)
- Metadata Editor (on page 493)
- Manual Data Editor (on page 527)
- (on page 496)Prediction Model Manager

(on page 531)However only the profiles of the respective tools can be administered.
Connection profiles for the **Migration Tool** are administered in their own dialog (on page 657).

## Attention

Changes in this dialog are only executed if the superordinate dialog from which the administration of the profile was opened has also been confirmed, by clicking on **OK**.

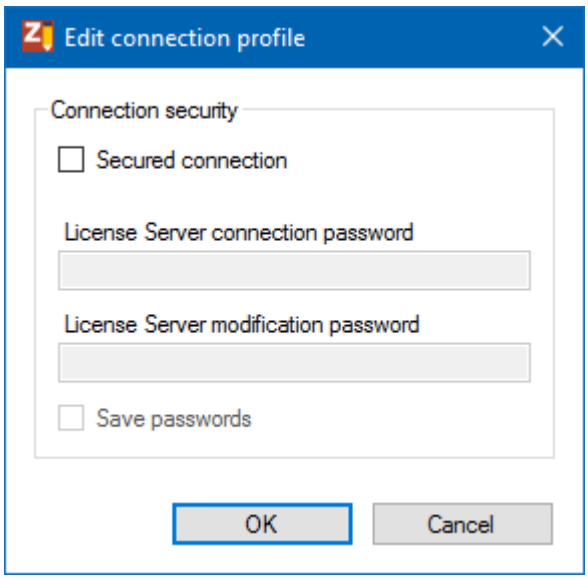



| Option | Description |
|---|---|
| **List of connection profiles** | The table displays all editable connection profiles.<br>**Note:** Metadata Editor and Manual Data Editor cannot edit the ZAMS connection profiles.<br>The following columns are shown:<br>▸ **Connection profile**: Profile name<br>▸ **Server computername**: Computer name of the SQL Servers<br>▸ **Database**: linked database<br>▸ **Secured connection**: Display by means of checkbox of whether communication is in secure form<br>Multiple selection is possible. |
| **Select all** | Highlights all entries |

| Option | Description |
|---|---|
| **Clear selection** | Deselects the highlighting of entries. |
| **Edit** | Opens the **dialog** (on page 41) for configuring a wake up call. |
| **Delete** | Deletes the highlighted connection profiles without requesting confirmation. Only available if at least one profile has been selected. |
| **Close** | Closes the dialog. The saving or rejection of changes is undertaken by the superordinate option dialog (see also the three option dialogs above). |

### 6.2.1.1.1 Edit

Activation or deactivation of the connection security for existing profiles.




| Option | Description |
|---|---|
| **Connection security** | Settings for the connection security (on page 82). The entries must correspond to the configuration on the server. |
| **Secured connection** | Activation or deactivation of the encrypted communication.<br>▸ *Active*: Communication is encrypted. For each connection, depending on the degree of encryption, passwords must be entered for the license service. |

| Option | Description |
|---|---|
| | ▸ *Inactive*: Communication is not encrypted. |
| **License Server connection password** | Entry of the password for the connection to the license server. Input is always hidden. The actual length is disguised. If the input field is active, it must be filled in order for a connection to be established.<br><br>Only active if the **Secured communication** and **Save passwords** options have been activated. |
| **License Server modification password** | Entry of the change password on the license server.<br>Entry is always hidden. The actual length is disguised. If the input field is active, it must be filled in order for a connection to be established.<br><br>Only active if the **Secured communication** and **Save passwords** options have been activated. |
| **Save passwords** | Stipulation of whether the connection parameters are saved in the connection profile.<br>Saving is carried out as a hardware-dependent and user-dependent hash of the password. |
| **OK** | Applies settings and closes the dialog. |
| **Cancel** | Discards all changes and closes the dialog. |

## 6.2.2 Deployment

In this tab you define:

- which actions happen automatically when a report is prepared or saved.
- Save path for report definitions
- access rights of objects
- Path for deployment

### AUTOMATION

Here, you define the behavior during deployment for:

- Saving the report definitions

- Overwriting reports on the Analyzer server
- Opening reports in the Microsoft Report Builder.

There are three procedures available for all these actions:

- *Yes*: carries out action automatically
- *No*: does not carry out action
- *Prompt*: Opens the dialog with a query of the user decision.
  **Note:** Closing the dialog for the query is interpreted as a *no* and the preparation is continued.

The save path for the report definition files can be pre-selected.

## ACCESS RIGHTS OF OBJECTS

You can use two options to define whether access rights are inherited or are only applicable for the logged-in user.

## FOLDER AND REPORT NAME FOR DEPLOYMENT

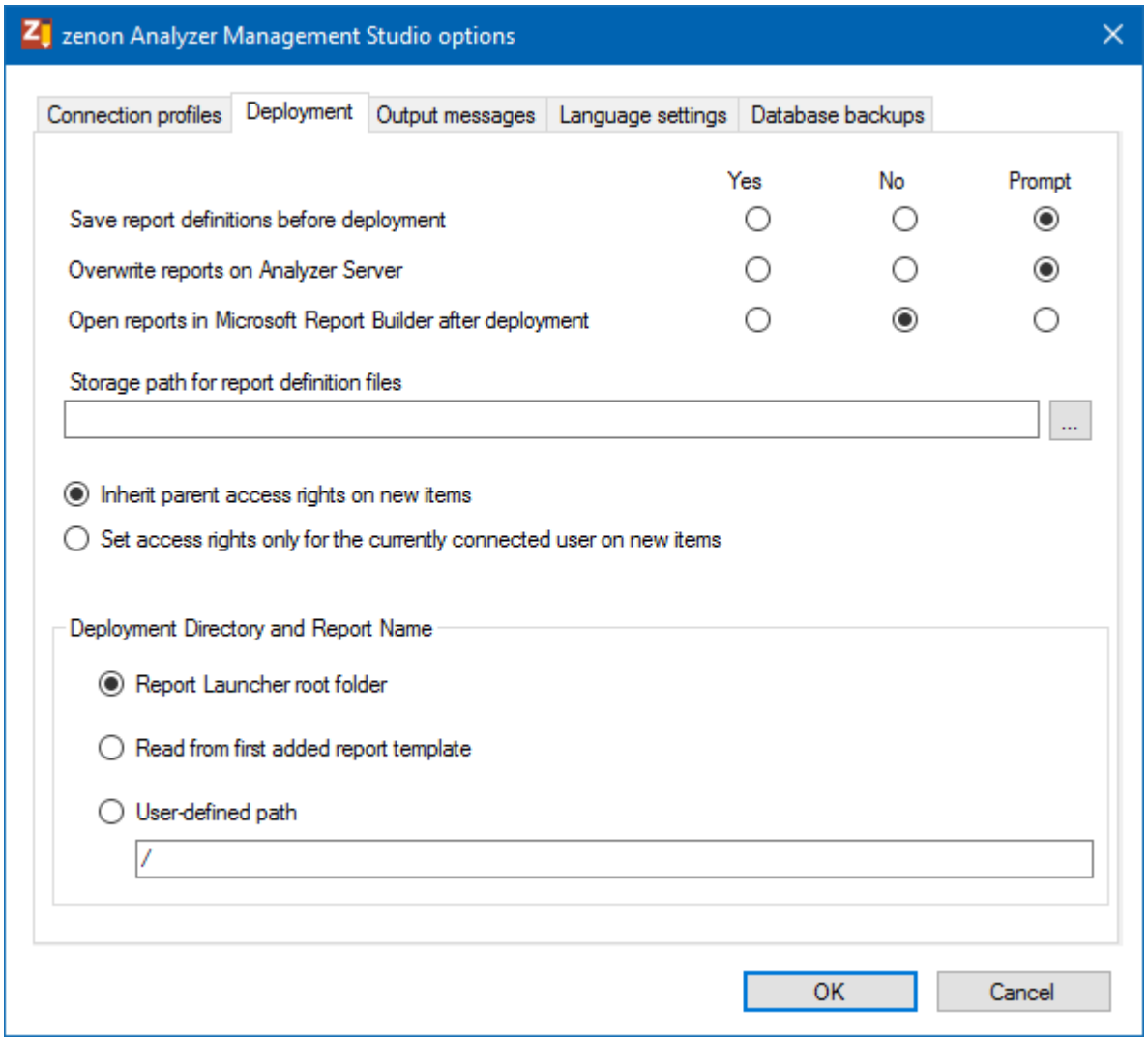
The folder and report name for deployment can be issued in the **deployment folder and report name** section in different ways:

- **Report Launcher root folder**:
  Reports are saved in the root folder of the Report Launcher.
- **Read from first added report template**:
  The following is applicable for this option:
  - The folder is determined by the first selected report template.
  - The report name is taken from the selection of the report template.
  - These settings are applicable per language.

  **Example:** For a new report, the **Archive trend** report is selected from the **Archive analysis** theme. **Archive analysis** is automatically selected as a folder on the Analyzer server. It is created if it is not present. All other reports are also stored in this folder automatically. The report name is automatically called **Archive trend**.
- **User-defined path**:
  A name given by the user is used for the folder. It is automatically created on the server if it is not present.
  The report name is entered into the report template.

**Note:** The report name cannot consist of more than 126 characters. Report name and report path have a maximum of 252 characters.

## DEPLOYMENT DIALOG

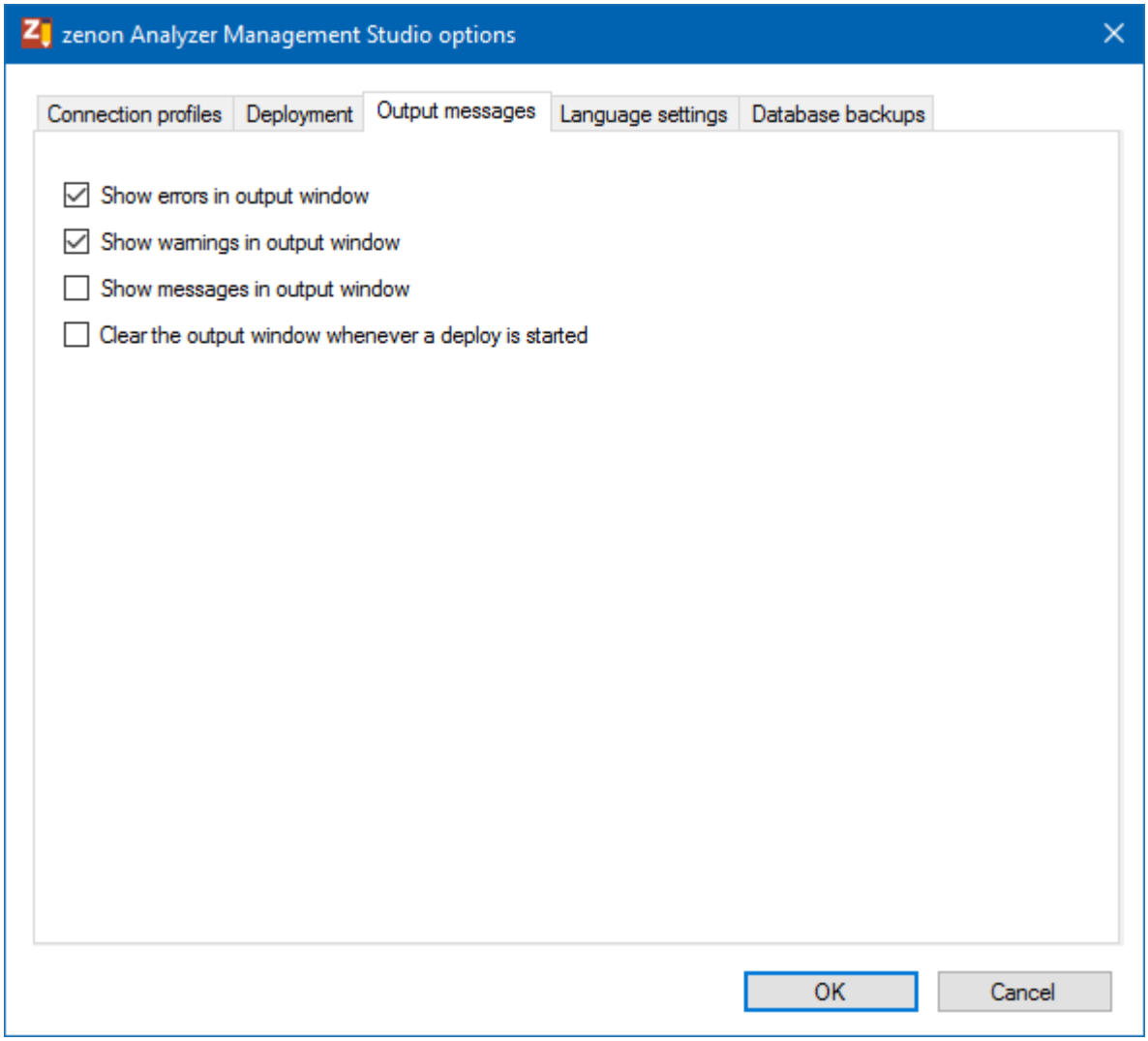



| Option | Description |
|---|---|
| **Save report definitions before deployment** | Decision on whether reports are saved on the hard drive before being deployed.<br><br>Default: *Prompt* |
| **Overwrite reports on Analyzer Server** | Decision on whether reports on the Analyzer server are to be overwritten.<br>Only has an effect if the **Save report definition before preparing** option has been set to *Yes* or *Query* has been set.<br><br>Default: *Prompt* |
| **Open reports in Microsoft** | Decision on whether reports can be opened in Microsoft |

| Option | Description |
|---|---|
| **Report Builder after deployment** | Report Builder after they have been deployed.<br><br>Default: *No* |
| **Storage path for report definition files** | Folder in which reports are saved. Click on the **...** button to open the browser to select a folder. Report files have the file name suffix**.zams_rep**. The path is saved for each user.<br><br>Default: *%Public%\Documents\Analyzer_Reports* |
| **Inherit parent access rights on new items** | ▸ *Active*: Newly-created objects have the same access rights (on page 435) as the object that is superordinate to them. |
| **Set access rights only for the currently connected user on new items** | ▸ *Active*: Only the user connected at the time of creation of the new objects has access to these new objects. To do this, they are assigned the role of Content Manager (on page 435). |
| **Deployment Directory and Report Name** | Selection of how the path and report name are determined using radio buttons:<br>▸ **Report Launcher root folder**<br>▸ **Read from first added report template**:<br>▸ **User-defined path** |
| **OK** | Applies all changes in all tabs and closes the dialog. |
| **Cancel** | Discards all changes in all tabs and closes the dialog. |

## 6.2.3 Output messages

In this tab, you define the display of messages in the output window.




| Option | Description |
|---|---|
| **Show errors in output window** | ▸ *Active*: Errors are displayed in the output window. |
| **Show warnings in output window** | ▸ *Active*: Warnings are displayed in the output window. |
| **Show messages in output window** | ▸ *Active*: Messages are displayed in the output window. |
| **Clear the output window whenever a deploy is started** | ▸ *Active*: The output window is cleared as soon as a function to deploy a report is executed. |

| Option | Description |
|---|---|
| **OK** | Applies all changes in all tabs and closes the dialog. |
| **Cancel** | Discards all changes in all tabs and closes the dialog. |

## 6.2.4 Language settings

The language of the ZAMS user interface and the language for reports can be pre-defined in ZAMS, regardless of the language of the operating system.

### ZAMS LANGUAGE WHEN ZAMS IS STARTED

The language of the operating system is detected and set when ZAMS is started. If another language has been defined for the ZAMS user interface in the options, this is used. If it is not possible to switch to a pre-defined language, the language of the operating system remains active.

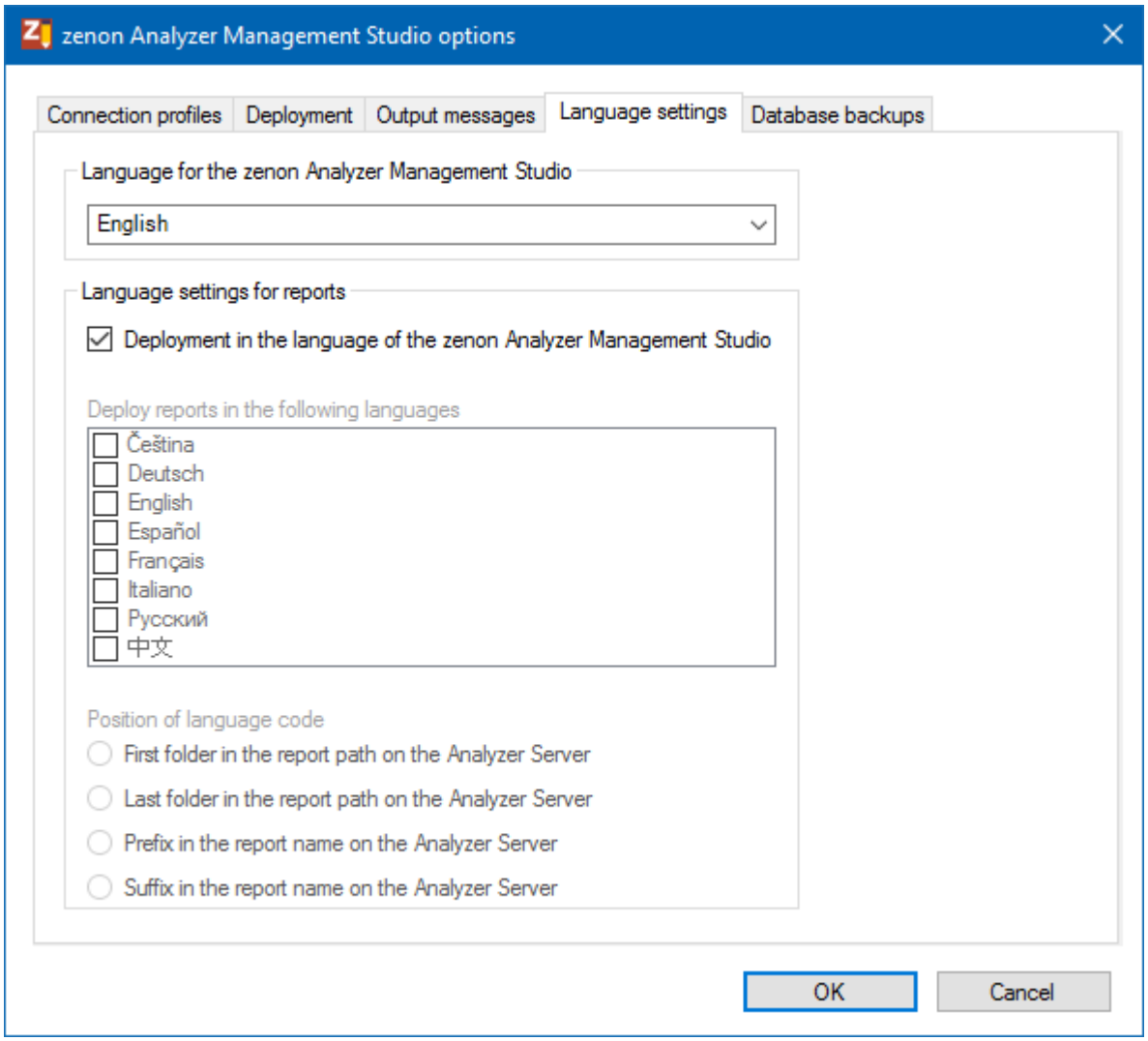
The switching of the ZAMS user interface language affects all areas of ZAMS, including report templates and data files.

### CONFIGURING THE LANGUAGE

To configure the language settings:

1. Open the menu **File**
2. Select the command **Options**.
3. Open tab **Language settings**
4. Select the desired language for ZAMS and/or the reports.

## DIALOG LANGUAGE SWITCHING



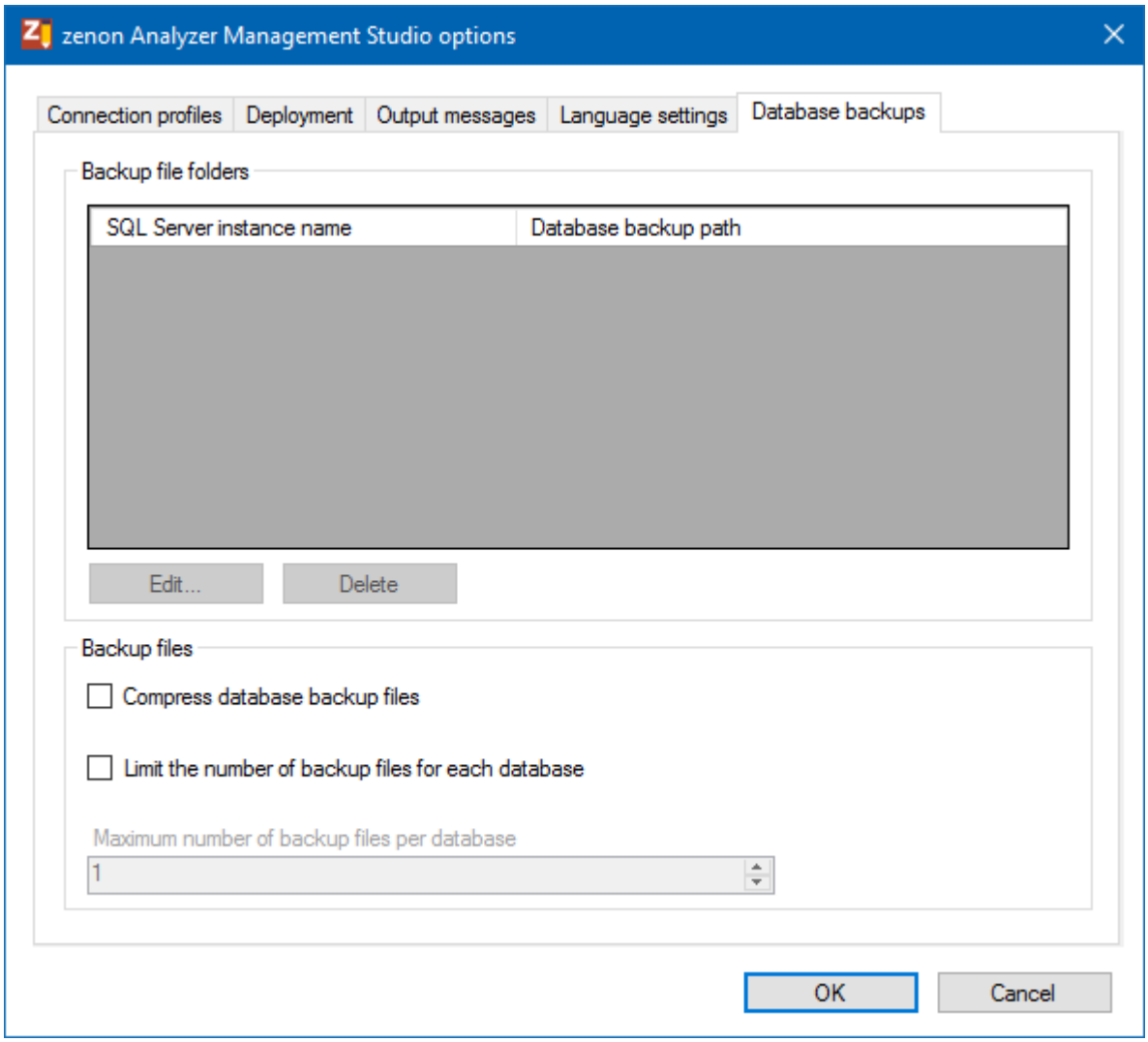

| Option | Description |
|---|---|
| **Language for the zenon Analyzer Management Studio** | Selection of the language for the ZAMS user interface from a drop-down list. The languages available are displayed in the writing convention of the respective language.<br><br>The language is immediately switched after the change is set and **OK** is clicked on. |
| **Language settings for reports** | Configuration of the languages for the preparation of reports. |
| **Deployment in the language of the zenon Analyzer Management Studio** | *Active*: Reports are always created in the language that was selected in the **Language for the zenon Analyzer Management Studio** option. |

| Option | Description |
|---|---|
| | *Inactive*: Reports are prepared in languages for which the checkboxes have been activated in the **Deploy reports in the following languages**.<br><br>Default: *active* |
| **Deploy reports in the following languages** | The languages of reports can be defined individually. To select a language, the checkbox in front of the language must be activated. |
| **Position of language code** | Setting for the procedures of how reports are stored according to the assigned language and displayed in the **All report deployment paths** of the report configuration.<br>The following options are available:<br>▸ **First folder in the report path on the Analyzer Server**<br>▸ **Last folder in the report path on the Analyzer Server**<br>▸ **Prefix in the report name on the Analyzer Server**<br>▸ **Suffix in the report name on the Analyzer Server**<br><br>(for further information, see the following options.) |
| ▸ **First folder in the report path on the Analyzer Server** | *Active*: An independent folder system is created for each language. To do this, in the path for the report, a folder with the respective language designation is created, and below this there are the folders for the themes. The reports are stored in the folders assigned to them.<br><br>For example: */DE/Alarmanalyse/Alarmliste*<br><br>*/EN/Alarm analysis/Alarm list* |
| ▸ **Last folder in the report path on the Analyzer Server** | *Active*: All languages have a common folder structure for the theme. To do this, a folder with the respective language designation is created for the report below the folder of the theme. The reports are stored in the folders assigned to them.<br><br>For example: */Alarmanalyse/DE/Alarmliste* |

| Option | Description |
|---|---|
| | */Alarm analysis/EN/Alarm list* |
| ▸ **Prefix in the report name on the Analyzer Server** | *Active*: Language designators are placed before the report names. To do this, reports are stored in the respective folder for the theme. Each report contains a prefix with the language designation and an underscore..<br>For example: */Alarmanalyse/DE_Alarmliste*<br>*/Alarm analysis/EN_Alarm list* |
| ▸ **Suffix in the report name on the Analyzer Server** | *Active*: Language designators are added to the report names. To do this, reports are stored for the respective theme in the folder. Each report contains a suffix with an underscore and the language designation.<br>For example: */Alarm analysis/Alarm list_DE*<br>*/Alarm analysis/Alarm list_DE* |
| **OK** | Applies all changes in all tabs and closes the dialog. |
| **Cancel** | Discards all changes in all tabs and closes the dialog. |

## 6.2.5 Database backups

The path for the database backup and the number of the backup files to be created is configured in this tab.




| Option | Description |
|---|---|
| **Backup file folders** | Lists all configured database backup paths:<br>▸ **Name of the SQL server instance**: Instance that is to be backed up.<br>▸ **Database backup path**: Folder in which the backup is to be created<br>Precisely one row can be highlighted in the table. The highlighted row can be edited or deleted.<br>**Note:** At this point it should be added that the |

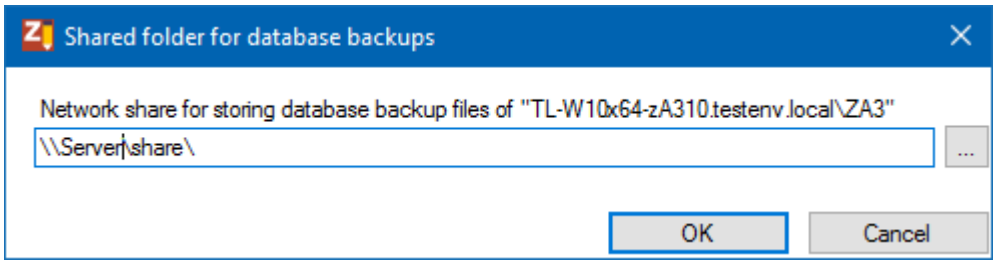
| Option | Description |
|---|---|
| | database backup always only works for the currently-connected SQL server instance. Editing in the dialog only works without an existing connection. |
| **Edit** | Opens the dialog for editing the backup path. |
| **Delete** | Deletes the selected entry. |
| **Backup files** | Configuration of the options for the backup files. |
| **Compress database backup files** | Setting of whether backup files are compressed.<br>▸ *Active*: Backup files are compressed.<br>Setting has an effect on all:<br>▸ from the changing of the option of manually-created backups<br>▸ Newly-created or amended automated backups<br>▸ New implicit database backups during database conversion<br>Existing database backup jobs are not changed. These must be explicitly amended using the appropriate menu item.<br>Database backup jobs are recognized and compressed or uncompressed and displayed accordingly. This detection and display depends on the status of this option. |
| **Limit number of backup files for each database** | ▸ *Active*: The number of backup files created is limited. The limit is defined in the **Number of backup files per database** option. As soon as the maximum has been reached, the oldest backup file is deleted each time a new backup file is created.<br>▸ *Inactive*: Unlimited backup files are created. **Attention:** Note the amount of memory available. If the limit of the storage medium is exceeded, no more backup files are created. |
| **Maximum number of backup files per** | Setting for the maximum number of backup files to |

| Option | Description |
|---|---|
| **database** | be created.<br>▸ Minimum: *1*<br>▸ Maximum: *100*<br>▸ Default: *1* |
| **OK** | Applies all changes in all tabs and closes the dialog. |
| **Cancel** | Discards all changes in all tabs and closes the dialog. |

## STORAGE PATH FOR DATABASE BACKUP FILES:

The first time a backup request is made and a path has not yet been established, you are requested to define a save path. This path is then used for all backups and restorations. This path is administered in the options in the Database backups (on page 51) tab of the Settings (on page 36).

**Note:** It is recommended that a path on the Analyzer computer is used for backup.




| Option | Description |
|---|---|
| **Network share path for storing database backup files of [database]** | A valid UNC path must be entered.<br>Clicking on the **...** button opens the dialog (on page 347) to select a network share.<br>A check is made if:<br>▸ The syntax of the path is valid if:<br>Only valid paths unlock the **OK** button.<br>▸ The path exists:<br>When clicking on **OK**, the path is only accepted if it can also be accessed.<br>▸ The path is different to that already used:<br>If a path is defined that is different to a path that has already been used, a corresponding message is given. The path can be created. The |

| Option | Description |
|---|---|
| | pre-existing database backup job can then be activated, deactivated and deleted, but can no longer be edited.<br><br>The configured path is saved individually for each user.<br><br>**Attention:** The access rights to network shares must be set correctly. For details, see the **Set access rights to network share correctly**. |
| **OK** | Accepts the path and closes the dialog. |
| **Cancel** | Discards changes and closes the dialog. |

### SET ACCESS RIGHTS TO NETWORK SHARE CORRECTLY

In order for all database backup or restore actions to run correctly, the access rights to the network share of the database backup folder must be correct. This path is administered in the settings (on page 36).
In doing so, the following applies:

- The folder must be on the Analyzer Server, because defined users must access it locally on the Analyzer Server.
- Because the folder must be accessible by both the Analyzer Server and the ZAMS computer with the same path, it must be authorized in the network. The folder is then accessible with the same path via a UNC path everywhere in the network.
- The following users must have full access to the network share:
  - **NT SERVICE\MSSQL$ZA3**: For the creation and restoration of backups.
    Defined **L**ocally on the Analyzer server. Virtual user, derived from the **SYSTEM**, in whose context the SQL Server instance is running.
  - **NT SERVICE\SQLAgent$ZA3**: For automatic creation of backups.
    Defined **L**ocally on the Analyzer server. Virtual user, derived from the **SYSTEM**, in whose context the SQL Server agent is running.
  - Every ZAMS user: To create and restore backups, administer backup files and administer automated backup jobs.

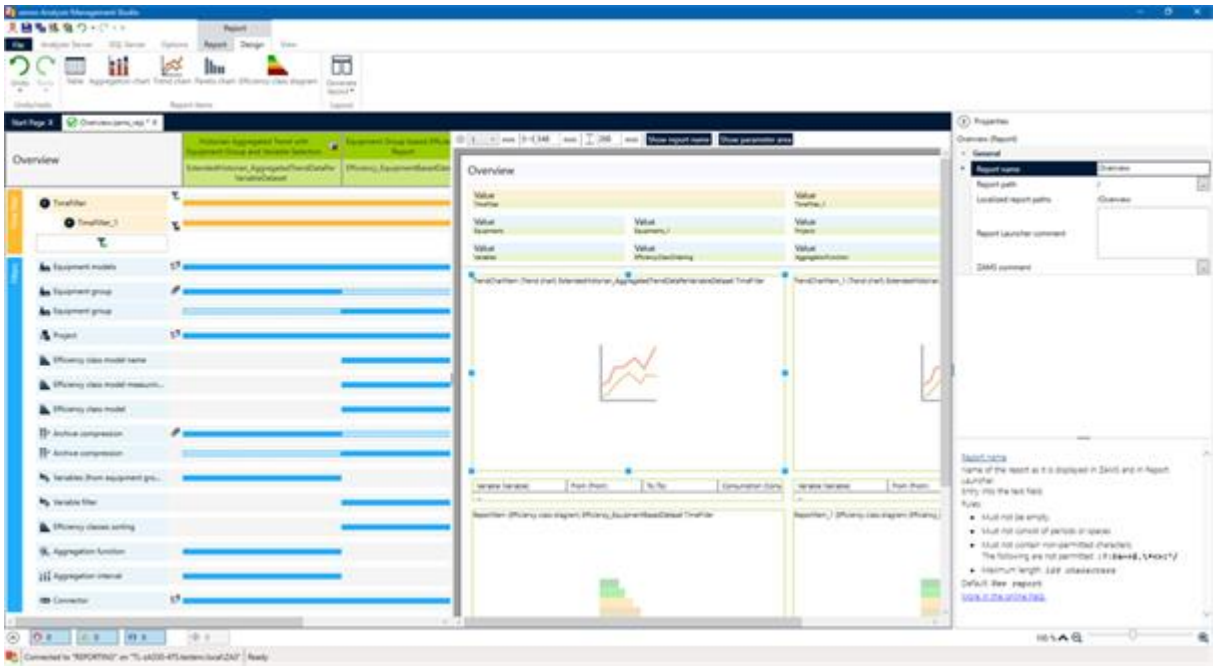
### BACKUP FILE NAME

The file name of a database backup file follows this scheme: **[database name]_yyyy_MM_dd_HH_mm_ss.bak**

e.g.: **ZA_DATA_2013_02_12_14_11_35.bak =** backup of **ZA_DATA** on *12.2.2013* at *14:11:35*

## 6.3 Main window

The main window contains the start page and all report pages. A separate page is opened for each report:



Navigation between the pages is carried out by clicking on the respective tab. To close a page, click on the **X** in the tab.
Tip: You can also use keyboard shortcuts:

- **Ctrl + F4**: Closes the active report.
- **Ctrl+Shift +F4**: Closes all reports.

### 6.3.1 Start Page

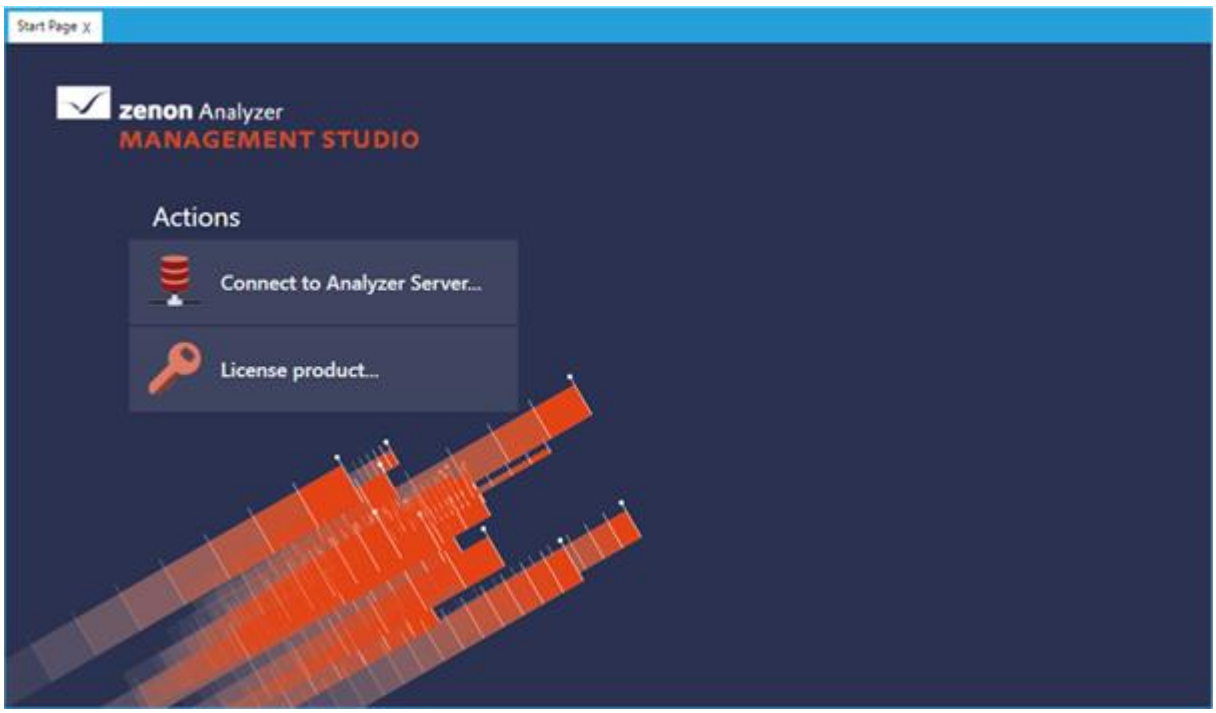
The start page is automatically opened when ZAMS is started. It contains different elements depending on the connection status.
If the start page has been deleted, it can be opened again using the **Start page** action in the **View** ribbon.

#### NO CONNECTION

The following is available if there is no connection to an Analyzer server:

- **Actions**: Quick access to often-used actions.
  - **Connect to Analyzer Server**: Opens the dialog to establish a connection.

- License product: Opens the **License Manager**. This can be used to activate and assign licenses.

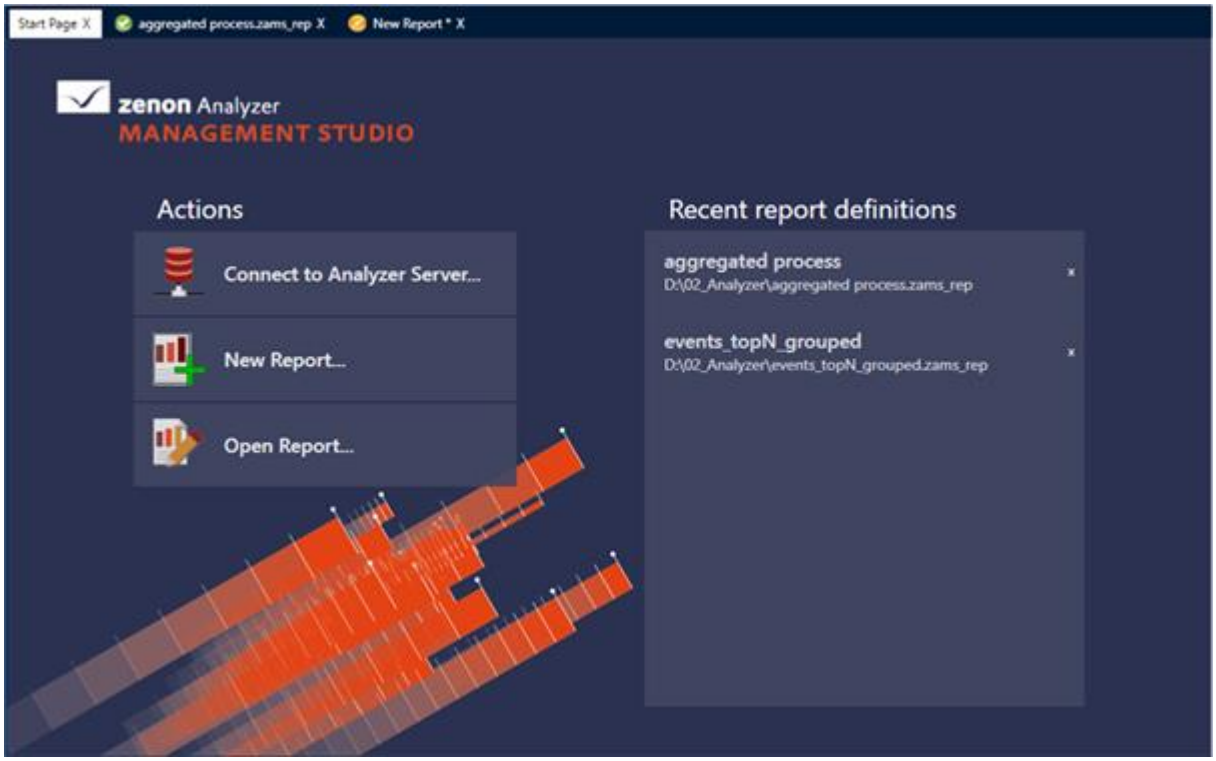



## CONNECTION ESTABLISHED

The following is available if there is a connection to an Analyzer server:

- **Actions**: Quick access to often-used actions.
  - **Connect to Analyzer Server**: Opens the dialog to establish a connection.
  - **New report**: Creates a new report and opens the dialog to select a report template.
  - **Open report**: Opens dialog to select a saved report.

- **Recent report definitions**: List of the report definitions last saved.
  Individual report definitions can be deleted from the list by clicking on the **x** button. The complete list can be deleted in the connection profile settings (on page 37).



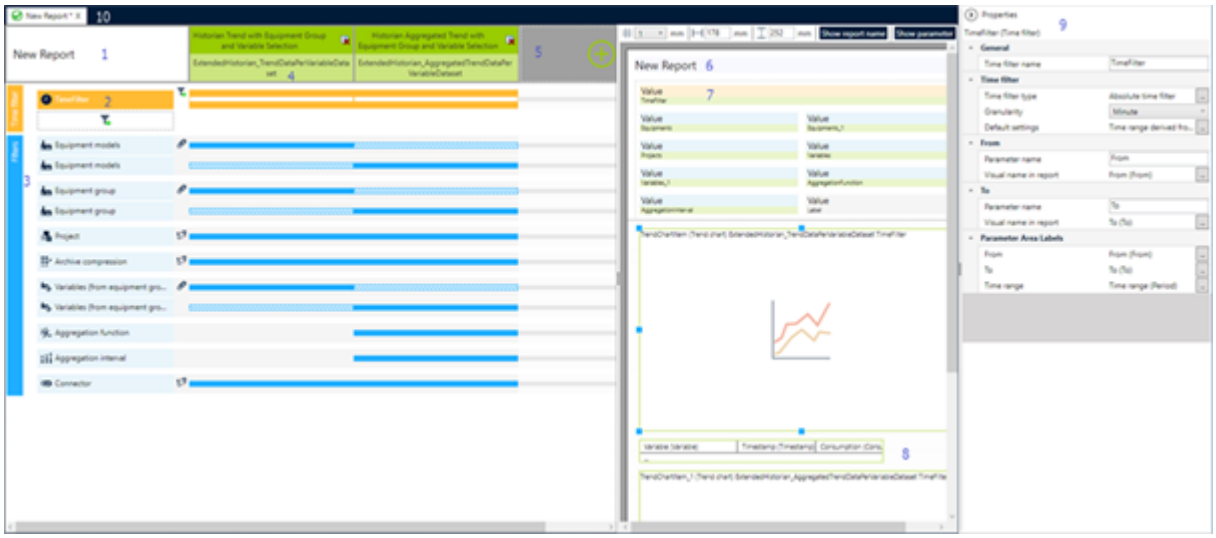

## 6.3.2 Report page

In the report page, report template for a report are selected, configured and arranged in the report. The report settings are configured in the **Properties window** (on page 67).

### Notes:

- If several reports are opened, each report is shown in its own page with a tab. The name is displayed in the indicator of the tab.
- Each report can use several report templates as a basis.
- If the mouse pointer is moved to above the indicator of the tab, the complete path to the save location is shown.
- Reports that contain unsaved changes are highlighted with an asterisk next to the name.
- Reports that are write-protected are displayed with a corresponding notice in brackets in the register title.

## OVERVIEW OF REPORT PAGE



1. Report name
2. Time Filter
3. Report settings (configuration elements)
4. Main dataset
5. Add dataset
6. Design area: Report name
7. Design area: Parameter
8. Design area: Report elements (diagrams, tables)
9. Properties for filter and settings with embedded help
10. Tab with:
    - Report title
    - Symbol for validation:
      - exclamation mark: Validation error in the report template
      - green tick: Successful validation

| Item | Description |
|---|---|
| **Report name (1)** | Display of the report name. This is configured using the properties. The display of the name in the Report Launcher is controlled using the corresponding control element in the design area (6). |
| **Time filter (2)** | Configuration of the time filter. These are always shown in the upper area of the report settings:<br>▸ Filter symbol with plus sign: Adds new filters. |

| Item | Description |
|---|---|
| | Symbol next to filter adds variant for configured filter. Symbol below the filter adds a new basic filter.<br>▸ Filter symbol with plus sign: Removes the attendant filter.<br>Up to 10 time filters can be configured in total. |
| **Report settings (3)** | Display of the configuration elements required for the respective report for data origin or data preparation.<br>They relate directly to the data of the report or offer a detailed configuration for other report settings. |
| **Report templates / main data sets (4)** | Each column to the right of the filter contains a main data set. A report template has at least one main data set, but can also have several more.<br>Symbol with red **X** deletes the report template from the table. |
| **Groupings** | If more than one report template has been selected, the respective report settings can be linked or separated using buttons.<br>Lines in the cells of the main data set show the assignment of report settings to main data sets:<br>▸ full: is assigned to this main data set.<br>▸ hatched: is not assigned to this main data set. It can be assigned however.<br>▸ No line: No assignment to this data set is possible.<br>The linking is carried out by means of symbols or Drag&Drop.<br>**Drag&Drop:**<br>If the mouse is moved over a line, the mouse pointer shows whether the report settings can be linked.<br>▸ Mouse pointer as a hand: Setting can be linked to another one (source).<br>▸ Mouse pointer with rectangle: The target can be linked to the source.<br>▸ Mouse pointer with dotted circle: No linking possible. |

| Item | Description |
|---|---|
| | **Symbols:**<br>▸ **Merge symbol**: Clicking on the symbol links main data sets.<br>The configuration for all linked report settings is thus applicable.<br>▸ **Break up symbol**: Separates linked main data sets.<br>The settings are set specially for report settings.<br>**Note:** The symbols for linking and separation are only visible if the attendant action can also be executed. |
| **Add report template (5)** | Clicking on the button opens the dialog to select a report template. A maximum of 5 report templates can be used. If 5 report templates are loaded in the report, the button is deactivated. |
| **Design area (6, 7, 8)** | Here, tables and graphics can be inserted and places using the **Design** tab.<br>**Attention:** This configuration is not a replacement for MS Report Builder; it only offers a limited preview and does not necessarily correspond to the subsequent view in Report Launcher. |
| **Properties (9)** | Separate window (on page 67) in which the properties of the configuration elements are edited. |
| **Tab** | The tab for the report template contains:<br>▸ The file name for the report template *.zams.rep<br>▸ A symbol for the validation of the configuration<br>Validation display:<br>▸ Exclamation mark: Validation error in the report template<br>▸ Green check mark: Successful validation |

## GENERAL NOTES

### DATA LABELING

Data fonts for pie charts are always outside the pie segments.

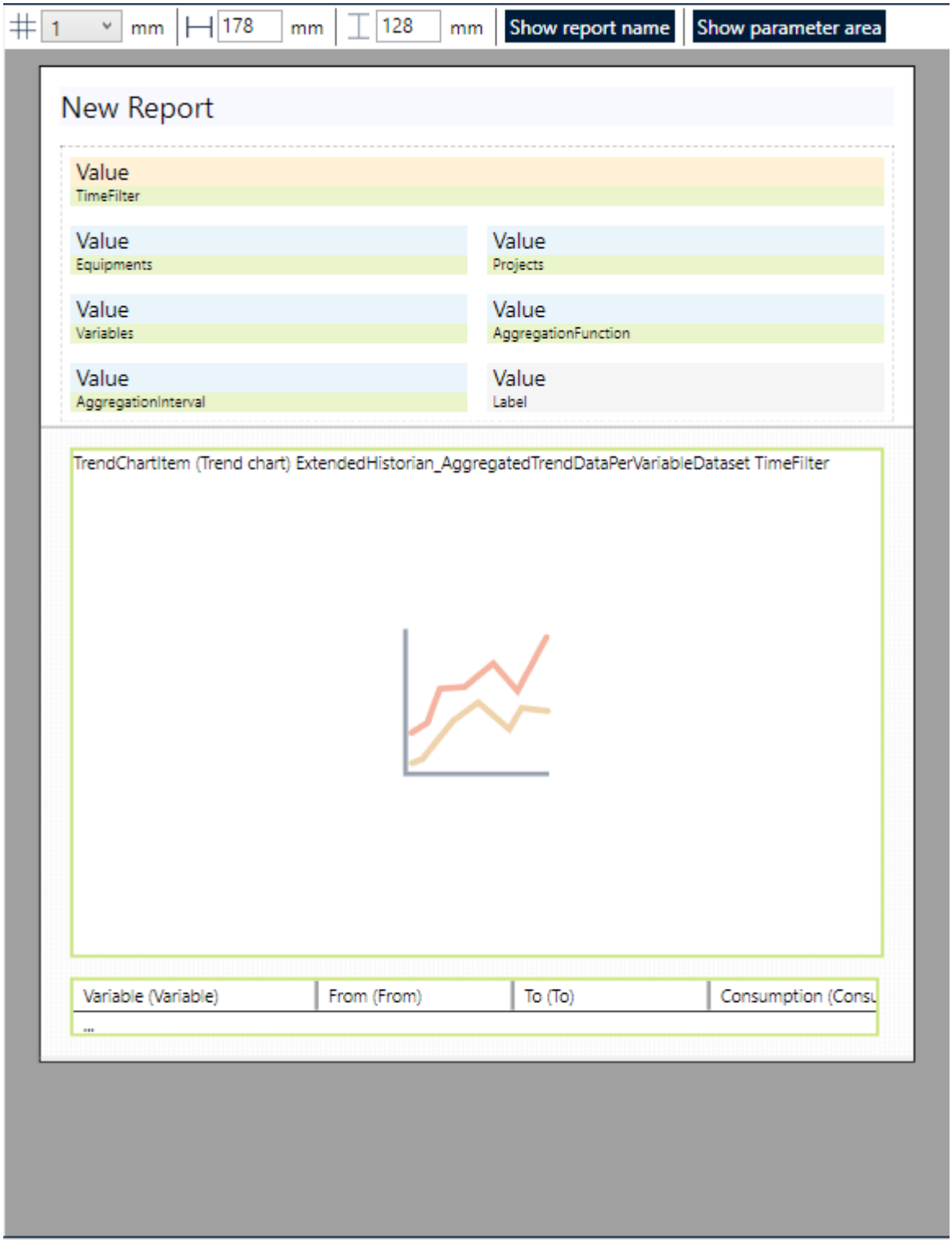
### REPORT SETTINGS

You can find details on the report settings in the **Elements in the report** chapter and in the report creation documentation.

## 6.3.2.1 Graphical configuration in the design area

The design area allows the compilation of a report with the graphical elements that are to be subsequently used when creating the report in Report Launcher.

**Attention:** This configuration is not a replacement for MS Report Builder; it only offers a limited preview and does not necessarily correspond to the subsequent view in Report Launcher.



| Item | Description |
|---|---|
| **Toolbar** | Contains properties for the configuration of:<br>▸ **Grid size**<br>▸ **Height**<br>▸ **Width**<br>▸ **Show report name**<br>▸ **Show parameter area** |
| **Report name** | Display of the report name.<br>Can be hidden. |
| **Report parameters** | Display of the report parameters.<br>Can be hidden. |
| **Graphical elements** | Display of the report using tables and/or graphics.<br>Configuration using the symbols of the **Design** *ribbon*. |

**Hint:** Use the **Generate layout** action to create a standard layout in the design area.

## ELEMENTS IN THE REPORT AREA

The elements in the report area are placed and configured by means of Drag&Drop or by means of properties. Above all:

- **Report name**
- Parameter display
- Report items:
  - Tables
  - Diagrams

  After selection of a report element in the ribbon, the element can be positioned in the design area. As soon as the mouse is in an area in which the element can be placed, the corresponding element is symbolized instead of the mouse pointer. The element is added at the corresponding mouse position after clicking in the design area.

### SIZES AND POSITION

Report elements have, if they are highlighted, handles on the edge, with which the sizes and position can be changed by means of Drag&Drop. Moving is only possible within the report limits. The position and size can also be changed in the properties window. The minimum size depends on the respective type of report element.

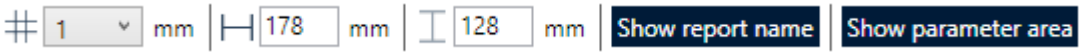
The main data set and time filter can be set for all report elements.

The following is applicable for the input of sizes and positions:

- All sizes and positions are stated and calculated in millimeters.
- Entries are corrected to the maximum permitted value.
  For example: If a width of 1 is entered, the value is set to the minimum possible width possible due to the content of the report.
- Report elements must not overlap, but can border one another directly.
  During configuration, overlaps are shown visually with red coloring.
- If report elements are positioned too close to the border when being added, they are moved automatically.
- If report elements are too large for the configured report width, they are amended automatically.

### TOOLBAR

The appearance of the report area can be configured using different actions in the toolbar:




| Tool | Description |
|---|---|
| **Grid size** | Creation of the grid size. All elements present in the report are directed towards this window.<br>- Minimum: *1 mm*<br>- Maximum: *10 mm*<br>Default: 1 *mm*<br>The grid is shown in the background of the report. Report elements can only be positioned in this grid.<br>Exceptions: Report parameters and elements within the elements (such as parameter output range and table columns).<br>If the grid size is changed, all report elements that have already been configured are emended to the new grid size. The report width may also be enlarged in the process. |
| **Width** | Setting the report width of the area in millimeters.<br>- Minimum: *92 mm* and dependent on |

| Tool | Description |
| --- | --- |
| | content<br>▸ Maximum: *10000 mm*<br>Default: *200 mm*<br>The width can only be amended using the value of this property. If elements are dragged from the edge, this has no effect on the width.<br>The width is automatically amended if:<br>▸ The grid size is increased<br>▸ Report elements too large for the configured width, for example if table columns are added and the table has already reached the pre-configured edge |
| **Height** | Setting the report height of the area in millimeters. Parameter range and report name are not included in it.<br>▸ Minimum: *50 mm*<br>▸ Maximum: *100000 mm*<br>**Note:** If the report exceeds a total size of *11557 mm* during preparation, a validation error is shown.<br>Default: *200 mm*<br>The height can only be amended using the value of this property. If elements are dragged from the edge, this has no effect on the height.<br>The height is automatically amended if:<br>▸ The grid size is increased<br>▸ Table rows are added and the table has already reached the pre-configured border |
| **Show report name** | Setting of whether the report name is shown in the header of the report.<br>Default: *active* |
| **Show parameter area** | Setting of whether the report parameters are displayed in the header area of the report. |

| Tool | Description |
|---|---|
| | Default: *active* |

### 6.3.2.2 Configuration process

To configure to a report:

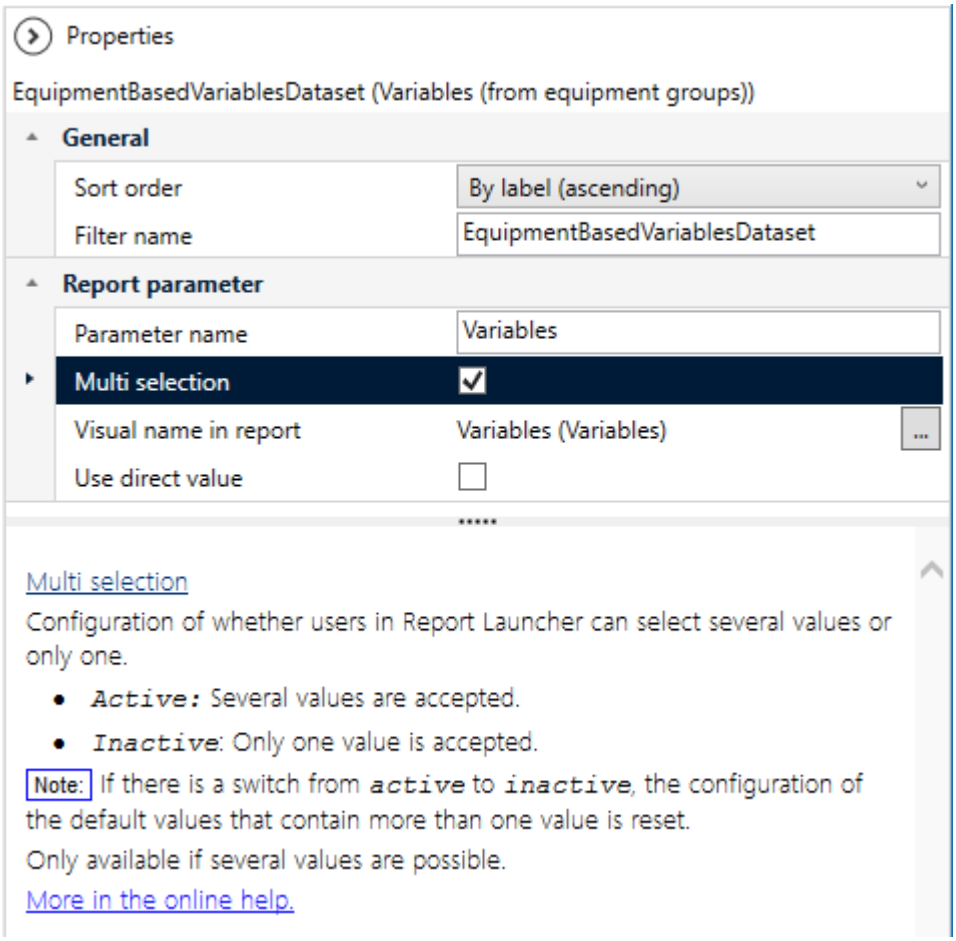
1. Create a new report or open an existing one
2. Select the desired report template.
   You can also combine several report templates into one report. To do this, click on the green plus sign in the header.
3. With several report templates, decide which report settings are to be linked by grouping.
4. Configure the properties of the report settings in the properties window.
5. If necessary, select the required actions in the **Design** (on page 32) ribbon, for example:
   - **Insert table**
   - **Insert diagram**
   - **Generate layout**
   - Actions for the report parameters

**Note:** You can zoom (on page 69) the display of the design area with the slider in the header of the output window.

You can find details on the configuration of reports in the **Create report** and **Examples for report configuration** sections.

## 6.4 Properties window

The properties of the report settings are configured in the properties window.




You can find details on the report settings in the **Elements in the report** chapter and in the report creation documentation.

### MINIMIZE PROPERTIES WINDOW

The properties window can also be minimized. To minimize or show the window again, click on the arrow in the left corner next to the buttons or on a free area in the bar.

## 6.5 Embedded Help

There is brief help available in each property that is configured in the ZAMS window directly. This help informs you of the use of the respective property and its configuration. A link leads to comprehensive help in the manual. Links to the manual or to other texts of the embedded help are opened in a separate window.

To display the help: Click on a property. The corresponding information is displayed in the window for the embedded help.
Requirement: The **Analyzer.chm** file must be present in the program folder of the ZAMS file. This is automatically installed with ZAMS.

The window is integrated into the properties window (on page 67). It is shown or hidden with it. Its height can be amended by means of a sliding line.
The embedded help is also available for the **Prediction Model Manager** and the dialog of the report styles.

## EMBEDDED HELP WINDOW

The window is below the properties.

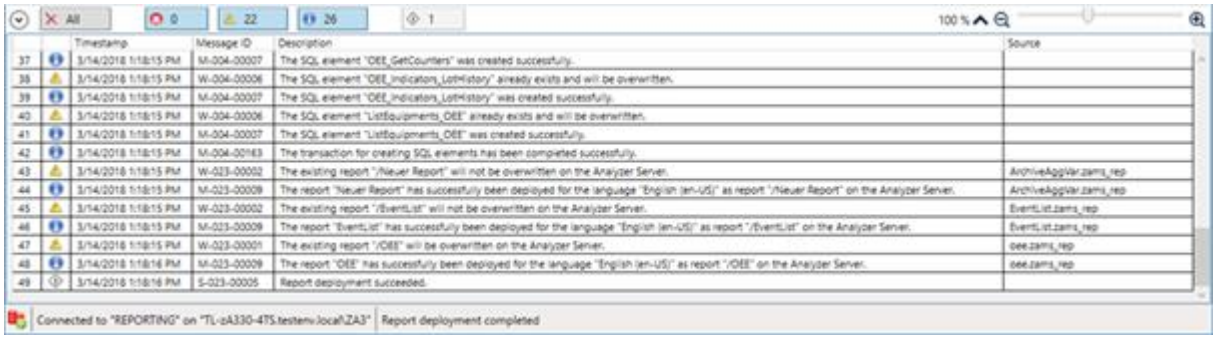
It consists of:

- **Title**: Name of the selected property.
- **Help text**: Information on the selected property and its configuration.
- **Link**: Link to the online manual. Click on the link to open the online manual as a CHM file in a separate window.

## 6.6 Output window

The output window lists error messages, warnings, information and status messages in a table. These notices can be filtered and deleted. The types of messages that are displayed are defined in Options (on page 46).

### DISPLAY IN THE OUTPUT WINDOW




| Property | Description |
|---|---|
| **Buttons** | Control display of messages and the hiding or display of the window. The setting of the buttons is saved when ZAMS is closed. |
| **Zoom slider** | Zoom settings for the design area of the report configuration. The zoom level currently used is shown to the left of the slider in percent.<br><br>The zoom range can be regulated between *25 %* and *200 %* by means of either:<br>▸ Moving the slider with the mouse: The zoom range is amended in steps of *5 %*.<br>▸ Click on the magnifying glass symbol for plus or minus: Clicking reduces or enlarges the zoom range in steps of *5 %*. If the symbol is clicked on and held, the zoom range is amended continually.<br>▸ Click on the arrow symbol and select a pre-defined zoom level. If one of the proposed zoom levels is currently used, this is also marked with a tick.<br><br>Default:*100 %* |
| **Delete all** | Clicking on the button empties the complete table. |
| **Error** | Button displays the number of errors that can be displayed in the table. Clicking on the button switches the display in the table on or off. |

| Property | Description |
|---|---|
| **Warnings** | Button displays the number of warnings that can be displayed in the table. Clicking on the button switches the display in the table on or off. |
| **Messages** | Button displays the number of messages that can be displayed in the table. Clicking on the button switches the display in the table on or off. |
| **Status messages** | Displays the number of status messages that are displayed in the table. These cannot be hidden. |
| **Table** | Contains error messages, warnings, information and status messages; also shows the source of the message, if available.<br>▸ Messages can be sorted with the column titles. Clicking on the respective column head sorts the table according to this column. A second click inverts the sorting. The standard sorting increases in accordance with column 1 **(Numbering**).<br>▸ Double clicking on a message in the table displays the report and the context in which the message was created in the report area of the main window. To do this, the report must already be open.<br>▸ Messages are deleted when ZAMS is closed.<br>Clicking on the header selects the column for sorting and sorting in ascending order. Clicking again reverses the order. |
| **Numbering** | Contains consecutive numbering. The numbers are assigned chronologically upon receipt. |
| **Symbol** | Symbol that displays the type of message. The symbols correspond to the symbols on the buttons.<br>Sorting sequence ascending:<br>▸ Error<br>▸ Warning<br>▸ Information<br>▸ Status information |
| **Timestamp** | Displays the time stamp of the time at which the message was created. |
| **Message ID** | Unique ID of the message. |

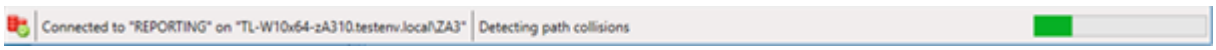
| Property | Description |
|---|---|
| **Description** | Explanation of the message. |
| **Source** | Name of the report concerned at the time the message was created. If the message was not created in the context of a report, this column remains empty.<br><br>The following are linked to reports:<br>▸ Messages when loading the report. For example messages on missing styles, incorrect server or database.<br>▸ All messages that are logged in dialogs that have been opened from a certain report. In the pivot configuration, for example.<br>▸ All messages when preparing a report.<br>▸ All messages when preparing several reports that can be assigned to one report. Messages that are applicable for several reports are displayed without assignment. |

### MINIMIZE OUTPUT WINDOW

The output window can also be minimized. To minimize or show the window again, click on the arrow in the left corner next to the buttons or on a free area in the bar. No messages are displayed when the window is minimized. The buttons with the display of the messages that are available continue to be displayed.

## 6.7 Status line

The status display of ZAMS informs you of the connection and objects.
It consists of several sections:




- Symbol that shows the status of the connection;
  Possible statuses are:
  - No connection established
  - Connection established
  - Secured connection established
- Connection message: Display of the server and the database
- Message that describes the current task

- Progress display that is shown if necessary and displays the progress during longer working stages such as:
  - Open report
  - Saving all reports
  - Deploying all reports
  - Opening all reports in Report Builder

## 6.8 Keyboard shortcuts

The following keyboard shortcuts are available in ZAMS when configuring reports:

### HELP

| Key combination | Meaning |
|---|---|
| **F1:** | Opens online help. |

### LICENSING

| Key combination | Meaning |
|---|---|
| **Ctrl+L:** | Shows the license information. |
| **Ctrl+Shift+L** | Opens the dialog to license the product. |

### REPORTS

| Key combination | Meaning |
|---|---|
| **Ctrl+N:** | Creates a new report and opens the dialog to select a report template. |
| **Ctrl+-O:** | Opens the dialog to select an existing report. |

### DEPLOYMENT

| Key combination | Meaning |
|---|---|
| **Ctrl+D:** | Starts the process to prepare the current report. |
| **Ctrl+Alt+D:** | Starts the process to prepare all open reports. |

### REPORT DEFINITIONS

| Key combination | Meaning |
|---|---|
| **Ctrl+S:** | Saves the current report in a report definition file. |
| **Ctrl+Shift+S:** | Opens a dialog to save a report definition file under a different name. |
| **Ctrl+Alt+S:** | Saves all opened report definition files. |

### REPORT WINDOW

| Key combination | Meaning |
|---|---|
| **Ctrl+F4:** | Closes the current report window. |
| **Ctrl+Shift+F4:** | Closes all open report windows. |

### SERVER CONNECTION

| Key combination | Meaning |
|---|---|
| **Ctrl+Shift+C:** | Opens the dialog to establish a connection to the server. |
| **Ctrl+I:** | Shows information on the current server connection. |

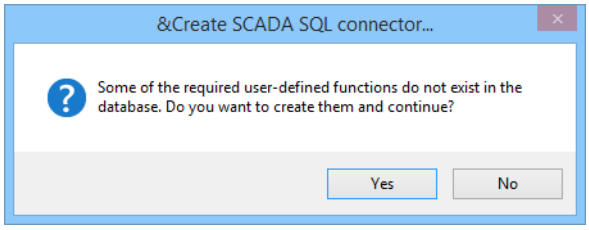
# 7 Analyzer Server and Reports

In ZAMS, you can:

- Manage Analyzer server (on page 74)
- Configure connection security (on page 79)
- Create and administer reports
- Deploy reports
- Manage RDL templates (on page 199)
- Automate report handling (on page 101)
- Display (on page 90) and enter (on page 91) licenses
- Automating processes (on page 101)
- Refresh caches (on page 346)

### MISSING UDF

With some actions, the database is checked to see that it is up to date. If missing **UDF**s are established, you receive an error message accordingly:




Available actions:

- **Yes**: The missing UDFs are created automatically. You can continue with the desired configuration.
- **No**: The action is canceled.

### CIRCULAR DEPENDENCIES WITH ARCHIVES

When configuring, it must be ensured that no circular dependencies of variables are created. This could lead to the SQL server instance crashing. When configuring emulated archives, archives of 3rd party databases or calculated archives, a corresponding check is automatically carried out in ZAMS. Configurations that lead to circular dependencies are prevented.

## 7.1 Information about the Analyzer Server

You can do the following via the **Analyzer Server** ribbon:

- Connect ZAMS to the Analyzer server
- Configure an activation call for the Analyzer Server
- Request the license status of the Analyzer server
- Assign new license
- Configure the connection security

### SERVER INFORMATION

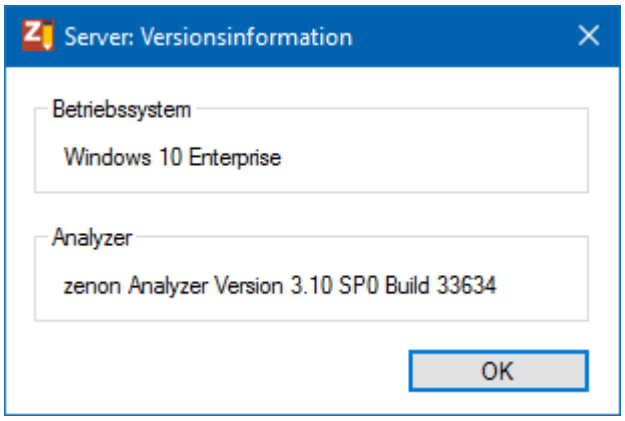
To receive information on the version of the Analyzer server:

1. select **Analyzer Server Version Information** entry in the **File** menu

   The information window is activated

2. You receive information on:
   - The operating system of the computer with the Analyzer server

- The version of Analyzer server that is running

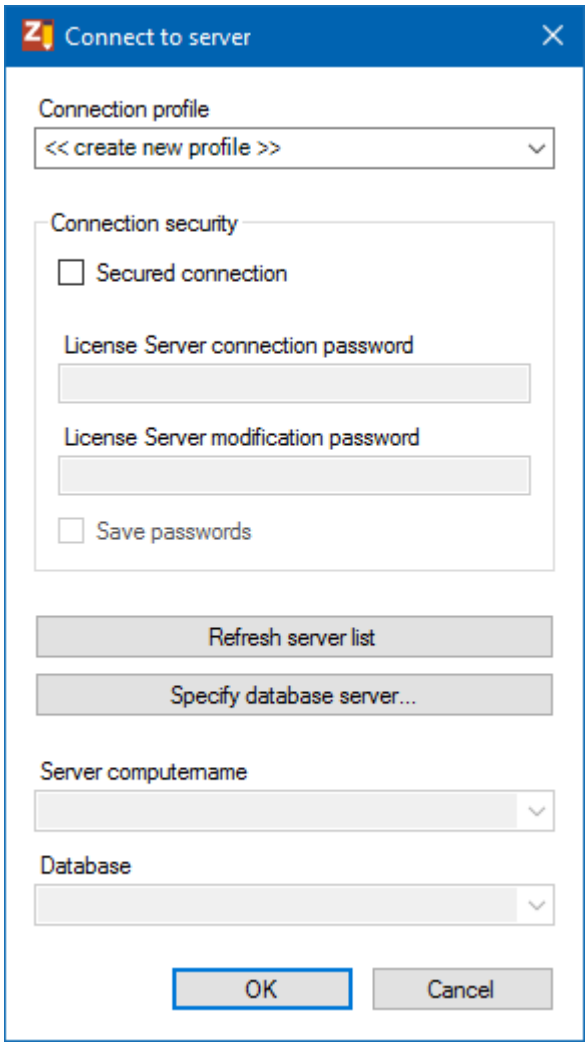



## 7.2 Configure connection

To create a new connection profile, select:

- When starting ZAMS, *Create new profile* as a profile
  or
- when ZAMS is running, the **Connect** entry in the **Analyzer server** ribbon.

The dialog for the configuration is opened:




| Option | Description |
|---|---|
| **Connection profile** | Selection of the connection profile from the drop-down list. The profile consists of a path for **server\database**.<br>▸ *Create new profile*: creates a new profile. |
| **Connection security** | Settings for the connection security (on page 82). The entries must correspond to the configuration on the server. |
| **Secured connection** | Activation or deactivation of the encrypted communication.<br>▸ *Active*: Communication is encrypted. For each connection, depending on the degree of encryption, passwords must be entered for the license service.<br>▸ *Inactive*: Communication is not encrypted.<br>**Note:** Secured communication cannot be configured for existing |

| Option | Description |
|---|---|
| | connection profiles. A new profile must be created. |
| **License Server connection password** | Entry of the password for the connection to the license server. Input is always hidden. The actual length is disguised. If the input field is active, it must be filled in order for a connection to be established. |
| **License Server modification password** | Entry of the change password on the license server.<br>Entry is always hidden. The actual length is disguised. If the input field is active, it must be filled in order for a connection to be established. |
| **Save passwords** | Stipulation of whether the connection parameters are saved in the connection profile.<br>Saving is carried out as a hardware-dependent and user-dependent hash of the password. |
| **Refresh server list** | A click starts a search for existing servers to which ZAMS can connect.<br><br>To do this, a list of all SQL server instance available in the network is checked to see if the attendant computers of the **ReportService2010 Web Service endpoint** and the license server can be reached.<br><br>**Note:** If a large amount of SQL servers are present in the system, the check can take a long period of time. The procedure is visualized by means of a progress display. |
| **Specify database server** | A click opens the dialog to enter a specific server.<br><br>This is the recommended procedure if the name of the computer and the SQL server instance of the Analyzer server are known. |
| **Server computername** | Selection of the computer name of the server to which ZAMS should connect, from a drop-down list.<br><br>If the desired server is not displayed, it can be added using the **Update server list** button or searched for via **Enter database server**.<br><br>**Note:** **localhost** is not a valid entry, because localhost is unknown in the domain. localhost is always replaced by the computer name. |
| **Database** | Selection of the database that ZAMS is to use from drop-down list. |

| Option | Description |
|---|---|
| **OK** | Accepts all inputs, validates them, creates them as a connection profile, closes the dialog and creates the connection. |
| **Cancel** | Rejects all inputs and closes the dialog without creating a connection. |

### CREATE NEW PROFILE

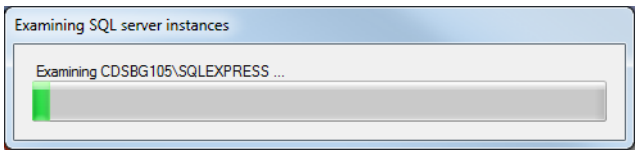
When creating a new profile, the profile that was used last is used as a template. The server is transferred, the database list is filled again, whereby the database selection is also transferred. To create a new profile:

1. Select in the **Connection profile** property, the *Create new profile* option.
2. Enter, if required, the data for the connection security (on page 82).
3. Select the server and database.
4. Confirm the information by clicking on the **OK** button.

## REFRESH SERVER LIST

To update the list of servers displayed, click on the **Refresh server list** button on the dialog for the connection profile. The search for servers to which ZAMS can connect is started. In doing so, the progress display shows you the following:

- The computer in the network that is currently being examined
- The progress of the search (with a green bar)

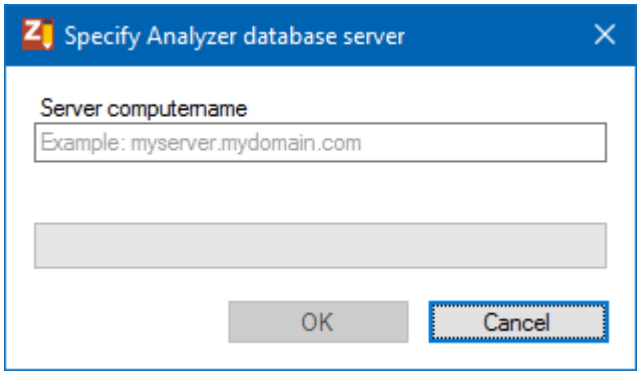



The progress display is closed once the search has been completed. The servers found are shown in the **Server computer name** drop-down list.

**Note:** If a large amount of SQL servers are present in the system, the check can take a long period of time.

### SELECT SERVER MANUALLY

To define the computer name of the server manually, **Enter database server** button in the dialog for the connection profile. The dialog to connect to a specific server is opened.




| Option | Description |
|---|---|
| **Server computername** | Entry of the computer name of the server to which ZAMS is to connect. A certificate must be installed for secure connections. This demands the server name as an **FQDN** (**Fully Qualified Domain Name**).<br>▸ Example of insecure: **myserver**<br>▸ Example of secure: **myserver.mydomain.com**<br>**Note: localhost** is not a valid entry, because localhost is unknown in the domain. localhost is always replaced by the computer name. |
| **Progress bar** | Shows the progress of the connection attempt.<br>If the attempt is not successful, a window with an error message is displayed and an error report is displayed in the ZAMS output window. |
| **OK** | Applies changes, validates them and closes the dialog. |
| **Cancel** | Discards changes and closes dialog. |

## 7.3 Connection security

Communication in zenon Analyzer can be encrypted. With the exception of encryption, the communication is to the **Connector Container**.
Configuration is via ZAMS and is used to establish a connection and for communication. ZAMS saves the configuration and the connection profiles if a different tool is started from ZAMS. **Manual Data Editor** and **Meta Data Editor** check, when loading their own connection profiles, to see whether there

is already a connection profile with the same name as their own connection profile for ZAMS. In this case, the connection profile with the most recent time stamp is loaded for use.

### Information

The connection security is only supported for domain networks, but not for Windows workgroups.

## ENCRYPTION SERVICES

| Service | Server | Client |
|---|---|---|
| **SQL server** | Decides on encryption. | No configuration necessary. |
| **Report Server** | Decides on encryption.<br>The server needs a certificate. | Clients for Report Launcher web server must use the URL for connection (HTTP or HTTPS). |
| **License service** | Decides on encryption. | Clients need the connection password.<br>A change password is required for authentication in the event that changes are made using ZAMS or the migration tool.<br>These passwords can be saved with connection profiles. Clients without a user interface read their configuration from the entries for the license service.<br>**Note:** Saved passwords can only be reused for unchanged PC hardware and the same Windows user. |

You can also create the certificates (on page 81) required for encryption yourself.

### Information

For report developers, there is a tool that can be used to reset the configuration. For details, see the **zenon Analyzer for developers** manual; **Tool: Analyzer Security Configuration** section.

## PROTOCOLS AND ENCRYPTION

Overview of services and their encryption:

| Service/connection | Protocol | Encryption | Authentication |
|---|---|---|---|
| **License service** | *TCP* | *AES 256* | Password. |

| Service/connection | Protocol | Encryption | Authentication |
|---|---|---|---|
| | | Hashes: *SHA 256* | ▸ Server: Passwords are encrypted depending on the hardware when saving.<br>▸ Applications: Passwords can be saved as an option and are encrypted depending on the hardware and the user. |
| **SQL Server instance** | *TCP* | *SSl* | Windows user (recommended) or separate password for SQL Server. |
| **Reporting services service** | *HTTP* | *SSl* | Windows users. |
| **SQL server instance** connection to **connector container** | *TCP* | None | **Recommendation:** In the firewall before the Runtime server, only allow communication via port *50778* (**connector container**) to clients that need it. |

### OPERATION WITHOUT ENCRYPTION

If zenon Analyzer is operated without encryption activated, the following is recommended:

- No Internet connection for computers with databases.
- No Internet connection for license server.
- Remote access via VPN only.

## 7.3.1 Certificates

A certificate is required for securing the report server.
Appropriate certificates can be created with the **Everywhere Certificate Creator**.

### REQUIREMENTS

Requirements for report server certificates:

- The complete domain name of the Analyzer server must be entered as a **Subject**. This is displayed in the URL.
  Otherwise the browser will report problems with the certificate security.
  **Note:** Some browsers also report an invalid certificate if the certificate used does not come from a location that is known to the browser.

- The call-up URL of the Report Launcher and the name of the Analyzer servers for various tools, such as ZAMS for example, must correspond to the name given in the certificate. Otherwise the HTTPS connection cannot be established.

You can find further details for the requirements for in the **Microsoft TechNet**:
https://technet.microsoft.com/en-us/library/ms189067(v=sql.105).aspx
(https://technet.microsoft.com/en-us/library/ms189067(v=sql.105).aspx)

### ACCESS BY SQL SERVER

The SQL Server instance must be able to access the certificate's **Private Key**.
There are two possibilities for this:

- Non-secure: Give the SQL Server instance (service user) local administrator rights. This procedure is expressly not recommended for reasons of system security.
- Recommended: Give the service user of the SQL Server instance access rights.
  To do this:
  - Open the computer certificate administration.
  - Right-click on the certificate
  - Select **Manage private keys**.
  - Give the service user of the SQL Server instance access rights.

    The name of the service user depends on the SQL instance.
    Example: **NT Service\MSSQL$ZA3**
    **Note:** The full name must be entered. The often-given short description of the user cannot be used.

## 7.3.2 Configure connection security

The connection security is configured in the **Configuration of the connection security** dialog.

To open the dialog, select the **Connection security** entry in the **Analyzer Server** ribbon. The entry can only be selected if Analyzer Server and ZAMS are on the same computer.

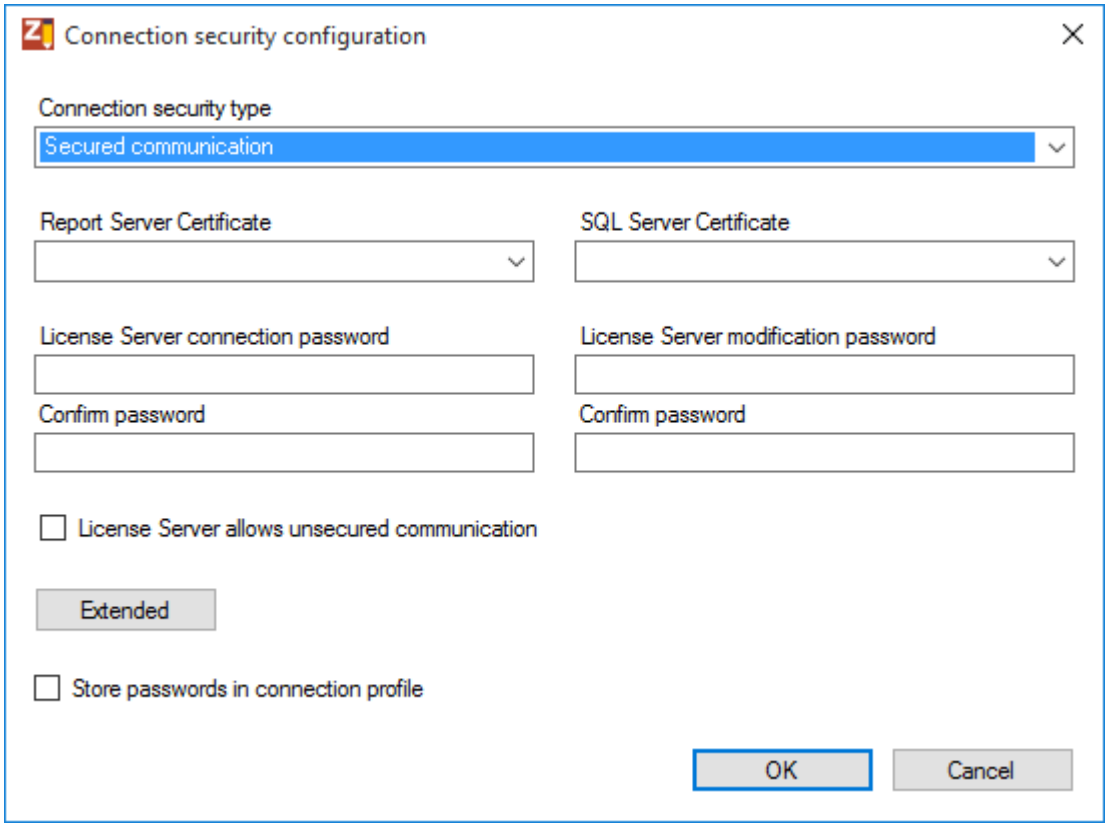
### CONFIGURE CONNECTION SECURITY

To configure the connection security:

1. Select the desired type.
2. Select the certificate with **secure communication**.
3. Issue and confirm the connection password and the change password for the license server.
4. Decide whether the license server also does not allow non-secure communication.

5. If necessary, configure the standard behavior (on page 87) for the entry of an incorrect password by clicking on the **Advanced** button.
6. Decide whether the passwords are saved in the connection profile or reentered for each new connection.

## DIALOG FOR CONFIGURATION OF THE CONNECTION SECURITY




| Option | Description |
|---|---|
| **Connection security type** | Selection of the type of secure connection from a drop-down list.<br>▸ *Unsecured communication*:<br>All communication for all services is not secure. (not recommended)<br>▸ *Unsecured communication. Secured communication with License Server allowed*:<br>SQL Server instance and report server only communicate in unsecured form. The license server allows secure and non-secure communication.<br>▸ *Secured connection*:<br>All services use secure communication. With the |

| Option | Description |
|---|---|
| | license service, it is also possible to decide whether non-secure communication is permitted. (recommended) |
| **Report Server Certificate** | Selection of the certificate for the securing of the HTTP connections and the web service connections for the report server. All locally-created certificates are available.<br><br>Only available if all services are secure for **Security type of the connection**. An entry must be selected if this drop-down list is active. |
| **SQL Server Certificate** | Selection of the certificate for the securing of the connections for the SQL Server instance.<br><br>All locally-created certificates are available. Alternatively, certificates can be created by SQL Server.<br><br>Only available if all services are secure for **Security type of the connection**. An entry must be selected if this drop-down list is active. |
| **License Server connection password** | Entry of the password for the connection to the license server.<br>Input is always hidden. The actual length is disguised. If the input field is active, it must be filled in order for a connection to be established.<br><br>Note the requirements in the **Rules for passwords** section.<br><br>Only available if the license service can communicate in secure form. |
| **Confirm password** | Repetition of the password for the connection to the license server. |
| **License Server modification password** | Entry of the change password on the license server.<br>Entry is always hidden. The actual length is disguised. If the input field is active, it must be filled in order for a connection to be established. Is used by ZAMS and the migration tool.<br><br>Note the requirements in the **Rules for passwords** section.<br><br>Only available if the license service can communicate in secure form. |

| Option | Description |
|---|---|
| **Confirm password** | Repetition of the password for changes to the license server. |
| **License Server allows an unsecured communication** | Stipulation of whether the license service, in addition to secure communication, also allows non-secure communication.<br>▸ *Active*: License server also allows non-secure communication.<br>▸ *Inactive*: License server only allows secure communication.<br>Possible settings and activity are determined by the security type:<br>▸ *Unsecured communication*: Checkbox not available.<br>▸ *Unsecured communication. Secured communication with License Server allowed*: Checkbox active and not available.<br>▸ *Secured connection*: Checkbox active and can be deactivated. |
| **Extended** | When clicking on "Extended", the ZAMS dialog for advanced Analyzer Server connection security settings (on page 87) is started. If this is confirmed with OK, the changes from this dialog are applied. |
| **Store passwords in connection profile** | Stipulation of whether the connection parameters are saved in the connection profile.<br>Saving is carried out as a hardware-dependent and user-dependent hash of the password.<br>Not available if all services are to be secured. In addition, your activity is determined by the configuration present before the dialog is called up:<br>If the initial configuration is *Secure communication*, the checkbox is inactive until all passwords for the license server have been re-entered.<br>As long as no password has been re-entered, the checkbox is then active if there are saved passwords in the connection profile that is currently being used. |

| Option | Description |
|---|---|
| | Example runtime behavior:<br>▸ The dialog is started with a configuration for *secure communication* and a connection profile with saved passwords:<br>Checkbox is inactive and not available.<br>▸ One of the input fields for the license service passwords will be changed:<br>Checkbox is inactive and not available.<br>▸ The remaining input fields for license service passwords are amended:<br>Checkbox is available in the moment in which the last unchanged password is amended. |

### CLOSE DIALOG

| Option | Description |
|---|---|
| **OK** | Click on OK to start the validation of the dialog.<br>If validation errors occur, these are shown by means of a notification dialog and the dialog remains open. If no validation errors occur, the dialog is closed and the changes are applied. |
| **Cancel** | Discards all changes and closes the dialog. |

## RULES FOR PASSWORDS

The following is applicable when issuing passwords:

- The input field must not be empty.
- Minimum length 8 characters
- Maximum length 20 characters
- The password must not contain any empty characters or word wraps.
- The password must contain at least one of the following categories from at least 3 of the following categories:
  - Capital letters: A-Z
  - lower case letters: a - z
  - Digits: 0-9

- Special characters: all other valid characters.
  The following are not permitted: spaces, carriage return or vertical spacing.)

- The password entered must correspond to the confirmation password entered.

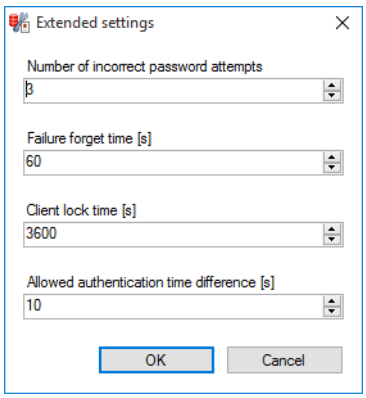
**Note:** The passwords for login and changes to the license server can be identical. However it is recommended that different passwords are used.

## 7.3.3 Advanced settings

In this dialog, you configure the settings for errors when entering a password and the behavior of the server:

- Number of permitted incorrect entries
- Time period in which the incorrect entries must be entered in order to be counted together
- Blocking time for the client in the event of multiple incorrect entries
- Permitted time difference for authentication

### ADVANCED SETTINGS DIALOG




| Option | Description |
|---|---|
| **Number of incorrect password attempts** | Number of incorrect attempts after which a client is blocked:<br>▸ Minimum: *1*<br>▸ Maximum: *1000*<br>Default: *3* |
| **Failure forget time** | Number of seconds after which a failed attempt is forgotten:<br>▸ Minimum: *1*<br>▸ Maximum: *86400* (1 day)<br>Default: *60* (*1 minute*) |

| Option | Description |
|---|---|
| **Client lock time** | Number of seconds that a client remains blocked after a block:<br>▸ Minimum: *1*<br>▸ Maximum: *86400* (1 day)<br>Default: *3600* (*1 hour*) |
| **Allowed authentication time difference** | Permitted deviation of the client's time stamp from the current time stamp of the server during authentication in seconds:<br>▸ Minimum: *1*<br>▸ Maximum: *86400* (1 day)<br>Default: *10* |
| **OK** | Applies settings and closes the dialog. |
| **Cancel** | Discards all changes and closes the dialog. |

### 7.3.4 Switching from secure to non-secure

The switching from a secure connection to a non-secure connection depends on the setup in the computer:

- Switching of an installation between secured and non-secured
- Switching of 2 installations between secure and non-secure (for example 3.00 & 4.00)
- Parallel operation of a secure and non-secure installation (for example 3.00 & 2.20)

**Note:** All installations are always on the same computer.

#### ONE INSTALLATION

Switching of an installation between secured and non-secured:

- Initial situation: There is only one zenon Analyzer installation on the computer. This allows secure connections.
- Procedure: The configuration can be changed as desired using ZAMS, because no further installations on the computer are affected.

#### 2 INSTALLATIONS

Switching of 2 installations between secure and non-secure:

- Initial situation: There are two zenon Analyzer installations (A and B) on the computer that allow secure communication.
- Procedure: In order to guarantee complete connectivity, the right steps need to be carried out in the right sequence.

### SWITCHING FROM SECURE TO NON-SECURE

Starting point: A and B communicate in plain text.

Configuration:

1. A is configured as a secure connection.
   The license service allows plain text communications.
   Result: A communicates in secure form, B communicates in plain text.
2. B is configured as a secure connection. This is initially shown as partially secure in the dialog.
   The license service does not permit plain text connections.
   Result: A and B communicate in secure form.

### SWITCHING FROM SECURE TO NON-SECURE

Starting point: A and B communicate in secure form.

Configuration:

1. A is configured as a partially secure connection.
   SQL Server and report server communicate in plain text.
   License service communicates in encrypted form and allows plain text.
   Result: A communicates in plain text, B communicates in secure form.
2. B is configured as a non-secure connection.
   Result: A and B communicate in plain text.

## PARALLEL OPERATION

Parallel operation of a secure and non-secure installation.

- Initial situation: There are two zenon Analyzer installations on the computer.
  A can operate with plain text and in secure form, B can only operate with plain text.
- Procedure: In order to guarantee complete connectivity, the correct configuration must be selected when switching from non-secure to secure.
  No problems can occur when switching from secure to non-secure.

### SWITCHING FROM SECURE TO NON-SECURE

Starting point: A and B communicate in plain text.

Configuration:

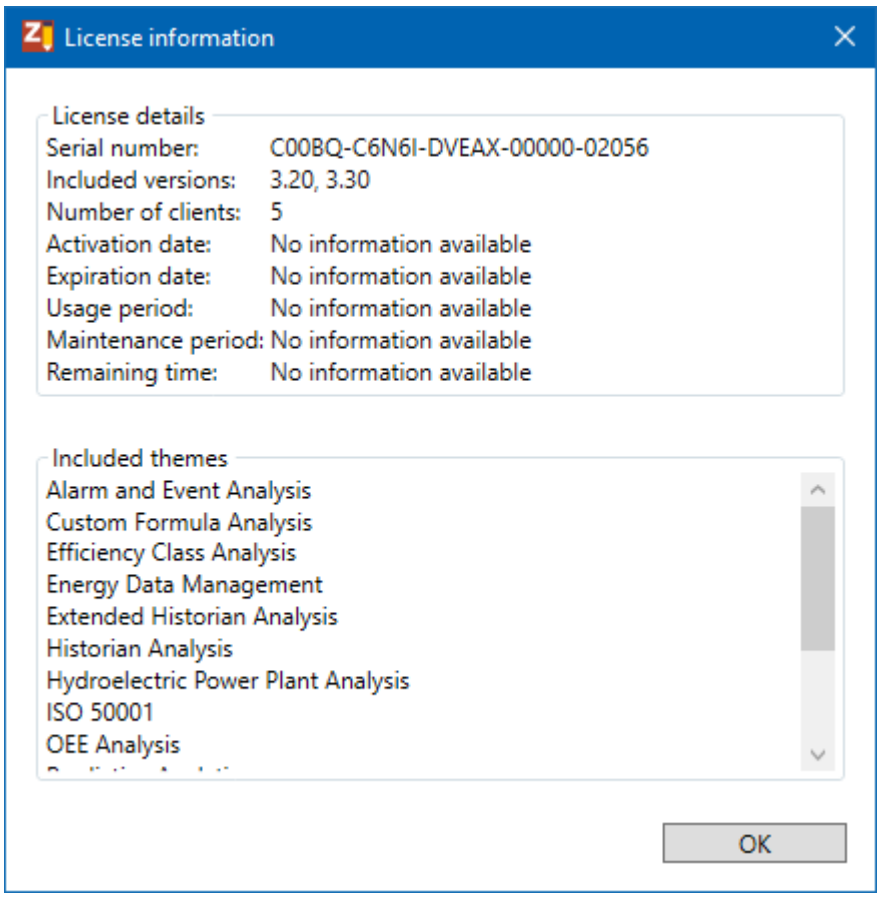
- A is configured as a secure connection.
  The license service allows plain text communications.
  Result: A communicates in secure form, B communicates in plain text.

## 7.4 Show license

To display the license used by the Analyzer server:

1. Select, in the **Analyzer server** ribbon, the **Show license** command

   The dialog with the license information is opened.




| Option | Description |
|---|---|
| **Licensing details** | Shows the details of the actual license. Above all:<br>- Serial number<br>- licensed versions<br>- Licensed clients<br>- Validity and expiration data |

| Option | Description |
|---|---|
| **Included themes** | Display of the report themes, included in this license. |
| **OK** | Closes the window. |

For details on licensing, see also the **Licensing** chapter.

## 7.5 Enter License...

To enter new license data:

1. Select the **License Product** button in the **Analyzer Server** ribbon.
   If there is no license, there is also a corresponding action available on the start page.

   The **License Manager** is opened.
2. Activate your license and/or assign the license to the zenon Analyzer.

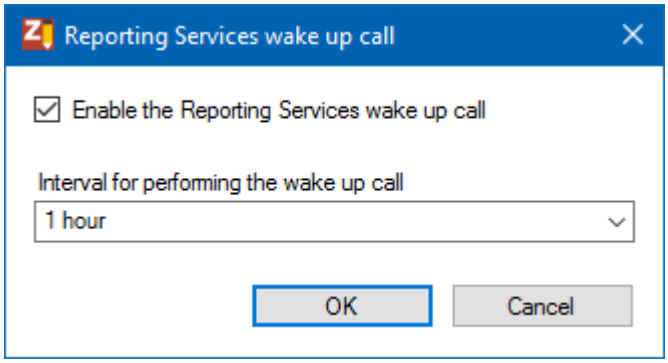
## 7.6 Configure Reporting Services wake up call

The caches of the **Reporting Services** are regularly emptied by the server if they are not accessed. Applications that access these must then wait until it is built up again. This also applies if the content has not changed. The **Reporting Services activation call** regularly initializes the reporting services and prevents the cache being emptied. This periodic call up can shorten the waiting time when calling up Report Launcher and when connecting ZAMS and the migration tool.

To configure to a wake up call:

1. In the **Analyzer Server** ribbon, click on the **Activation request** menu item.
2. The dialog for configuration is opened
3. Select the desired interval from the drop-down list.
4. Close the dialog by clicking on **OK**.

### REPORTING SERVICES WAKE UP CALL DIALOG



| Option | Description |
|---|---|
| **Enable the Reporting Services wake up call** | ▸ *Active*: An activation call is configured and is executed. The interval of the call is established with the **Interval of execution of the activation call**. |
| **Interval for performing the wake up call** | Selection of the interval for the activation call from the drop-down list. The following are available:<br>▸ *1 hour*<br>▸ *2 hours*<br>▸ *3 hours*<br>▸ *4 hours*<br>▸ *6 hours*<br>▸ *12 hours*<br>▸ *24 hours*<br>Default: *1 hour*<br>**Note:** Only values that can be divided into the number 24 without a remainder are available. This ensures that the call can always be periodic. |
| **OK** | Applies settings and closes the dialog. |
| **Cancel** | Discards all changes and closes the dialog. |

## 7.7 Configure email server...

In order to be able to send reports by email, the SMTP server must be configured. This is carried out in ZAMS using the **Email server** entry in the **Analyzer Server** ribbon - **Settings**.

### Attention

This function is only available if ZAMS is running on the Analyzer server and is connected to an Analyzer database with a valid license on the same computer and there is no other task running in the background.

You configure the email yourself with **Administer report subscriptions** in the **Delivery method** (on page 118) tab.

## CONFIGURATION

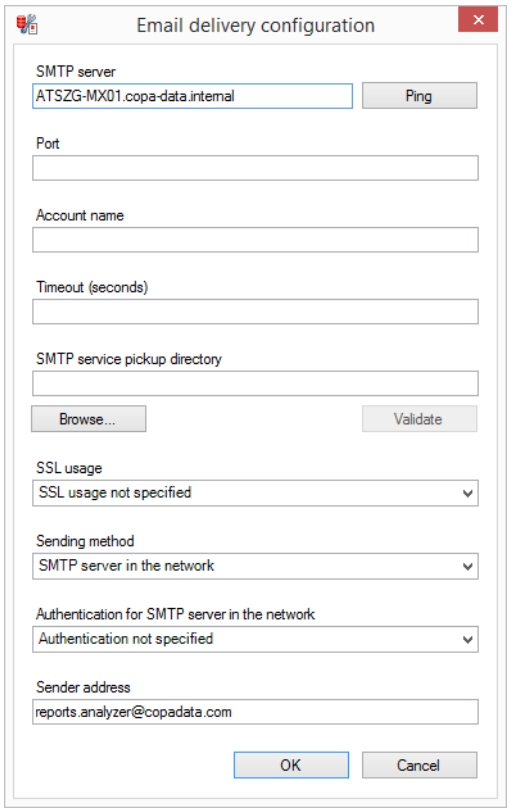
To configure email delivery:

1. Click on the **Email server** entry in the **Analyzer Server** ribbon.
2. The dialog for configuration is opened Entries that already exist are read and displayed. The existing configuration is saved in a separate file.
   If an error is detected when reading, a message is written to the output window and the dialog is ended.
3. Configure the required properties in the dialog.
   For further details see chapter **configuration dialog**
4. Confirm the changes by clicking on **OK**.
   The changes are written to the current configuration. If an error occurs, the previously-saved configuration is used.

**Note:** A progress bar is shown for actions that last longer.

**Recommendation:** Reconnect to the Analyzer Server once you have finished configuration.

## CONFIGURATION DIALOG



| Option | Description |
|---|---|
| **SMTP server** | Entering the SMTP server information<br>IP address, UNC name or fully-qualified domain name. |
| **Ping** | Clicking on the button executes a ping to the server entered.<br>Only available if a server has been entered. The result of the ping is output in a message box. |
| **Port** | Entry of the TCP port for SMTP at the given server.<br>Possible values: *0* to *65535*.<br>Invalid inputs are shown in a tooltip and not accepted. |
| **Account name** | Entry of the account name.<br>If no account name has been configured for the SMTP server, the field can remain empty.<br>Use the **Sender address** property to stipulate an email account for the sending of reports. |
| **Timeout (seconds)** | States how many seconds are waited for a valid socket connection with the SMTP service. The process is canceled after that.<br>Possible values: Whole number greater than *0*.<br>Default: *30* seconds.<br>**Attention:** The value is ignored if *SMTP server in the network* is selected as a **sending method**.<br>Invalid inputs are shown in a tooltip and not accepted. |
| **SMTP service pickup folder** | Entry of a local save path from which the SMTP service calls up outgoing emails.<br>It must be a fully-qualified local folder path (for example *D:\rs-emails*). |
| **Browse...** | Opens the dialog for selecting a folder. |
| **Validate** | Clicking on the button checks whether the path entered exists.<br>Only available if a path has been entered.<br>The result of the validation is output in a message box. |
| **SSL usage** | Determination of whether SSL can be used. Select from drop-down list: |

| Option | Description |
|---|---|
| | ▸ *SSL usage not specified*<br>▸ *Do not use SSL*<br>▸ *Use SSL* |
| **Sending method** | Selection of the sending method for emails from drop-down list:<br>▸ *Sending method not specified*<br>▸ *Local SMTP service pickup folder*<br>▸ *SMTP server in the network* |
| **Authentication for the SMTP server in the network** | Selection of authentication method. Select from drop-down list:<br>▸ *Authentication not specified*<br>▸ *No authentication*<br>▸ *NTLM authentication* |
| **Sender address** | Entry of a sender address for emails. Necessary if you use an SMTP remote server.<br>Format: **abc@host.xyz**<br>The address should be a valid email account with the authorization to send emails.<br>In the event of incorrect entries, the background color is switched to red and a tooltip is displayed. |
| **OK** | Applies settings and closes the dialog. |
| **Cancel** | Discards all changes and closes the dialog. |

## 7.8 Rename computer with Analyzer Server and reporting services

If a computer with Analyzer Server is renamed, this can lead to the SQL Server and reporting services no longer working correctly. This situation can be solved by complete reinstallation or subsequent manual editing. The steps for manual editing depend on the respective usage.

Solutions for the following scenarios:

- Analyzer Server in the Windows domain network with unsecured connection
- Analyzer Server in the Windows domain network with secured connection

- Analyzer Server in Windows workgroup with unsecured connection
- Analyzer Server in Windows workgroup with secured connection

**Note:** Naming of options, properties and buttons of Microsoft products relate to the English-language user interface in this description.

## DOMAIN NETWORK WITH UNSECURED CONNECTION

In a domain network with an unsecured connection, an error message is displayed when an attempt to connect to ZAMS is made after renaming the computer with the Analyzer Server and restarting: **The connection configuration is invalid or the license server is not responding**.

To rectify this error, you must reconfigure:

1. SQL Server instance on the Analyzer Server (on page 97)
2. Reporting Services on the Analyzer Server (on page 97)
3. Data source on the Report Launcher (on page 101)

## DOMAIN NETWORK WITH SECURED CONNECTION

In a domain network with a secured connection, an error message is displayed when an attempt to connect to ZAMS is made after renaming the computer with the Analyzer Server and restarting: **The connection configuration is invalid or the license server is not responding**.

To rectify this error, you must reconfigure:

1. SQL Server instance on the Analyzer Server (on page 97)
2. Reporting Services on the Analyzer Server (on page 97)
3. Certificate (on page 99)
4. Data source on the Report Launcher (on page 101)

## WORKGROUP WITH UNSECURED CONNECTION

In a workgroup with an unsecured connection, an error message is displayed when an attempt to connect to ZAMS is made after renaming the computer with the Analyzer Server and restarting: **The connection configuration is invalid or the license server is not responding**.

To rectify this error, you must reconfigure:

1. SQL Server instance on the Analyzer Server (on page 97)
2. Reporting Services on the Analyzer Server (on page 97)
3. License service and access rights (on page 100)
4. Data source on the Report Launcher (on page 101)

### WORKGROUP WITH SECURED CONNECTION

A secured connection is not currently supported in a Windows workgroup.

## 7.8.1 SQL Server Instance

To configure the SQL server instance:

1. Start the **Microsoft SQL Server Management Studio** on any desired computer in the network and connect to the zenon metadata database on the Analyzer Server computer.
2. Start the **SQL Query Analyzer** assigned to the zenon metadata database and check the SQL Server names.
   Carry out the following query to do this:

   **SELECT @@SERVERNAME**

   The previous name of the Analyzer Server is displayed.
3. Execute the following Stored Procedures.

   **sp_dropserver <old_name\instancename>;**
   **GO**
   **sp_addserver <new_name\instancename>, local;**
   **GO**
   **Zum Beispiel:**
   **sp_dropserver 'MyOldComputerName\ZA3';**
   **GO**
   **sp_addserver 'MyNewComputerName\ZA3', local;**
   **GO**
4. Restart the SQL Server service

   a) Right-click on the server.

   b) Select **Restart** in the context menu

   Alternatively, restart in the services manager (**services.msc**).
   Restarting in the services manager only works directly on the computer with the Analyzer Server.
5. Repeat the query of the SQL Server name with **SELECT @@SERVERNAME** and check whether the new SQL Server name is displayed.

The SQL server is thus configured.

## 7.8.2 Reporting services

To configure reporting services:

1. On the renamed Analyzer Server computer, start the **Reporting Services Configuration Manager**.
   This must be from the same SQL Server version as the instance.

   To do this, enter **Reporting Services Configuration Manager** into the Windows start window. The **Reporting Services Configuration Connection** dialog is shown. If several SQL Servers have been installed, several **Configuration Manager**s are offered.
2. Enter the new name for the Analyzer Server in the **Server Name** option.

   **Note:** The name of the local computer is shown by default. If you use a host name that is longer than 15 characters, it is cut off due to the limitations of the NetBIOS protocol.
3. For **Report Server Instance**, select the **ZA3** instance and click on the **Connect** button.
4. Open the **Database Setup** page and click on the **Change Database** button.
5. In the **Action** section, select the **Choose an existing report server database** option and click on the **Next** button.
6. In the **Database Server** section, check whether the new Analyzer Server name is shown in the **Server Name** option, followed by the **ZA3** instance name.

   The **Authentication Type** must be selected as *Current User - Integrated Security*.

   a) Test the connection by clicking on the **Test Connection** button.

   b) Then click on **Next**.
7. Select *ReportServer$ZA3* in the combobox for the **Report Server Database** option in the **Database** section.
8. Click **Next**.
9. In the **Credentials** section, check whether the *Service Credentials* entry has been selected in the **Authentication Type** combobox.
10. Click **Next**.

    The **Summary** section is shown. The following entries must be present:

    - **SQL Server Instance:** (Individual host name, as configured)
    - **Report Server Database:** *ReportServer$ZA3*
    - **Report Server Mode:** *Native*
    - **AuthenticationType:** *Service Account*
    - **Username:** *NT Service\ReportServer$ZA3*
    - **Password:** (individual password)
11. Click **Next**.

    The **Report Server Database Configuration** is now configured.
12. Click on the **Finish** button.

The **ReportServer$ZA3** report server service is stopped and restarted.

13. Click on the **Exit** button to close the **Reporting Services Configuration Manager**.

The reporting services are thus configured.

### 7.8.3 Renew certificate

The certificate used for the secured connection relates to the name of the Analyzer Server. A new certificate must therefore be created after renaming the computer.

To renew a certificate:

1. Create a private CA certificates or use an existing one.
2. Provide the certificate file (***.cer**).
3. Create a new public server certificate on the Analyzer server.
   To do this, use the name for the Analyzer Server and the corresponding private CA certificate.
   You can find further information on this in the Connection security/certificates (on page 81) chapter.
4. In the Analyzer Server, switch form secured to unsecured communication. This is how you can connect to the database. You then establish a connection with the new certificate. You carry out the switch to an unsecured connection with the **AnalyzerSecurityConfigurationTool**. To do this, start the Windows command prompt with administrator rights on the computer with the Analyzer Server:
   a) In the command prompt window, go to the */Program Files/COPA-DATA\zenon Analyzer 3* folder.
   b) Enter the following command: **AnalyzerSecurityConfigurationTool.exe action=write_config output=c:\ToolOutput.xml log=all config_type=insecure**
   c) Open ZAMS on the Analyzer Server and connect to your database via unsecured communication.
   **Note:** Ensure that you establish this connection using the Fully-Qualified Domain Name! Otherwise you cannot switch to secured communication in ZAMS.
   d) Switch to secured communication. To do this, click on the button for **Connection Security** (on page 82) in the **Analyzer Server** ribbon. Use the new certificate for Report Server and SQL Server.
5. If a new CA certificate has been created: Add, on the client computers - dedicated ZAMS computer, Report Launcher - the private certificates for Trusted Root certification. To do this, install the CER file or import it into Windows.
   Skip this step if an existing certificate is used.

6. On the client computers, connect to the Analyzer Server using secured communication.
   **Note:** If there is a firewall active on the server, then you must set an exception for: **sqlbrowser.exe** and/or UDP port *1434*.

## 7.8.4 License service and access rights

There are special conditions applicable for Windows workgroups for the license service on the Analyzer Server. Most of all, it must be registered as a local account with administrator rights. For the switch to a new host name, the host name must be corrected in the **zenAnalyzer.ini** file on the Analyzer Server.

To amend the license service and access rights:

1. Start the dialog to manage the services (**services.msc**).
2. Select the **zrsLicSrv** service.
3. Stop the service.
4. Open the properties dialog.
5. Check whether the user is a local account with administrator rights in the **Login** tab.
   If the user is local user account that relates to the computer name before renaming, or a local system account, then change the setting.
6. Start Windows Explorer and go to the **zenAnalyzer.ini** file.
   To do this, enter the following in the address line: **%cd_system%**.
7. open the **zenAnalyzer.ini** file with a text editor.
8. Replace the previous host names with the new host names for all entries for workgroup users.
9. Restart the **zrsLicSrv** service.

> **Attention**
>
> The same user who is used for **zenLicSrv** must be present on all other computers on which an Analyzer application is used for all groups in the workgroup (ZAMS, metadata editor, manual data editor, Prediction Model Manager).
>
> Otherwise the license server will not be found because the identification of the computer always fails.
>
> Administrator rights are not mandatory on these computers.
>
> If, on a computer that is relevant for the **zenLicSrv**, a user is switched, you must restart the **zenLicSrv**!

### 7.8.5 Report Launcher

To configure the data source in the Report Launcher:

1. Select the main directory in the symbol view and click on the corresponding database element.

   The page with the properties is displayed.
2. Correct the data source in the **Connection Character sequence** option:

   a) Enter the new Analyzer Server name.

   b) Press the TAB key to set the focus to another field.

   You are requested to enter the password again.
3. In the **Connect using** section, configure the **Credentials supplied by the user running the report** option.
4. Click on **Test connection** and **OK**.
5. In the **Connect using** section, configure the **Credentials stored securely in the report server** option.
   Enter the password for the **zenOnSrv** database user or the access data of another SQL user.
6. Test the database connection. To do this, click on the **Test Connection** button.
7. Confirm the configuration by clicking the **OK** button.

The data source is now configured.

> **Attention**
>
> This configuration must be carried out for each data source that contains the old computer name.

# 8 Automation

You can configure and start the following actions in the Options ribbon in the **Automation** ribbon group:

- Preparation of reports using schedules (on page 102)
- Report subscriptions (on page 112)

## 8.1 Manage schedules

In order for the provision of reports to be automated using schedules, there must be a connection to an Analyzer server with a valid license.

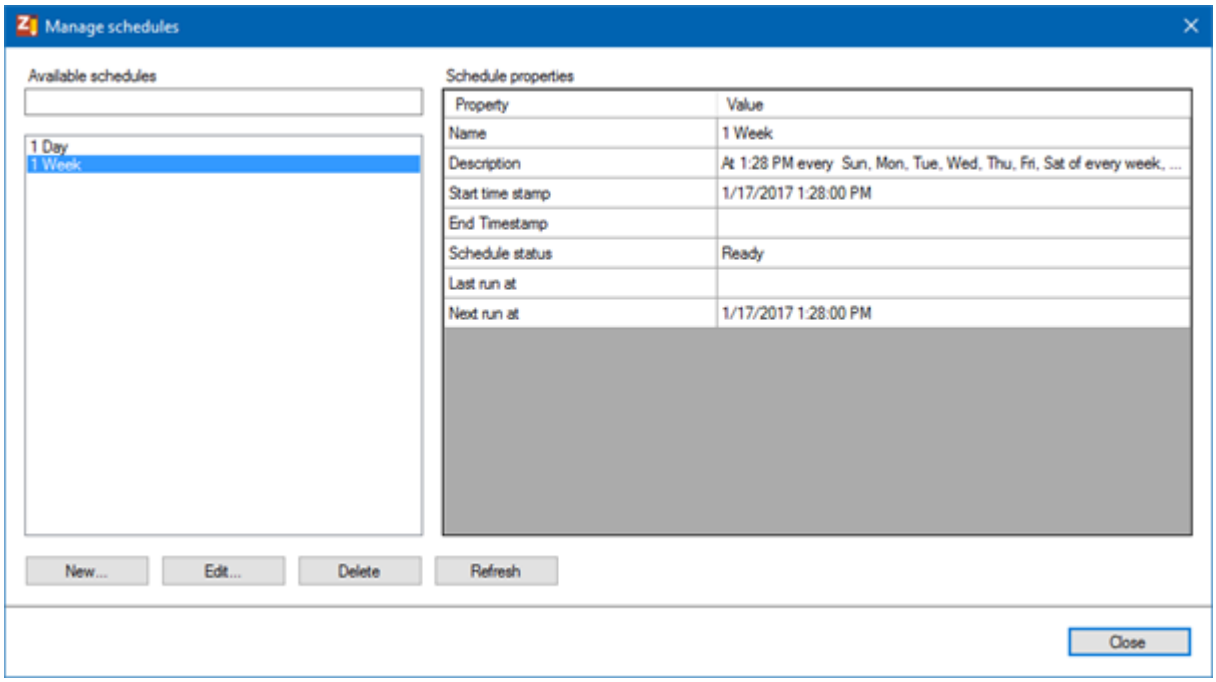
To create and administer schedules for the deployment of reports:

1. Select the **Schedules** entry in the **Options** ribbon group.

   The dialog for administering the schedule is opened.

   Preconfigured schedules are displayed.

2. Create a new schedule or edit an existing one.




| Option | Description |
|---|---|
| **Available schedules** | Display and filtering of the already-configured schedules. |
| **Filter field** | Entry of a filter for the **List of schedules**.<br><br>Only schedules that correspond to the filter criteria are shown in the list.<br><br>Wildcards:<br>▸ **?**: Wildcard for precisely 1 character<br>▸ *****: Wildcard for 0 or more characters<br><br>If there is no wildcard in the filter expression, a ***** is automatically added to the end when filtering.<br>For example: |

| Option | Description |
|---|---|
| | ▸ „" (empty field) becomes ***** <br> ▸ **test** becomes **test*** <br> ▸ **t?st** remains **t?st** |
| **List of schedules** | List of all preconfigured and available schedules. |
| **Schedule properties** | Displays the preconfigured properties of the schedule highlighted in the list. <br> ▸ Schedule name <br> ▸ Details about the schedule <br> ▸ Start time of the schedule <br> ▸ End time of the schedule <br> ▸ Status of the schedule <br> ▸ Time of the last execution of the schedule <br> ▸ Time of the next execution of the schedule <br> **Attention:** The texts can be displayed in different languages. They come partly from ZAMS and partly from the web service. These can be configured in different languages. |
| **New** | Opens the dialog to create a new schedule. |
| **Edit** | Opens the dialog to edit a schedule. |
| **Delete** | Deletes the selected schedule from the list and from the Analyzer server. <br> If a schedule to be deleted is used for one or more subscriptions, then a warning is given for each subscription. The user must decide if all relevant subscriptions should be deleted with the schedule. <br> ▸ **Yes**: First the respective subscriptions are deleted, then the schedule. <br> ▸ **No**: Neither subscriptions nor the schedule are deleted. |
| **Refresh** | Refreshes **List of schedules**. |
| **Close** | Closes the dialog. |

## CREATING AND EDITING SCHEDULES

**To create a new schedule:**

1. Click on the **New** button.

   The dialog is opened with the default values for all input possibilities.

**To amend an existing schedule:**

1. Highlight the desired schedule in the list.
2. Click on **Edit**.

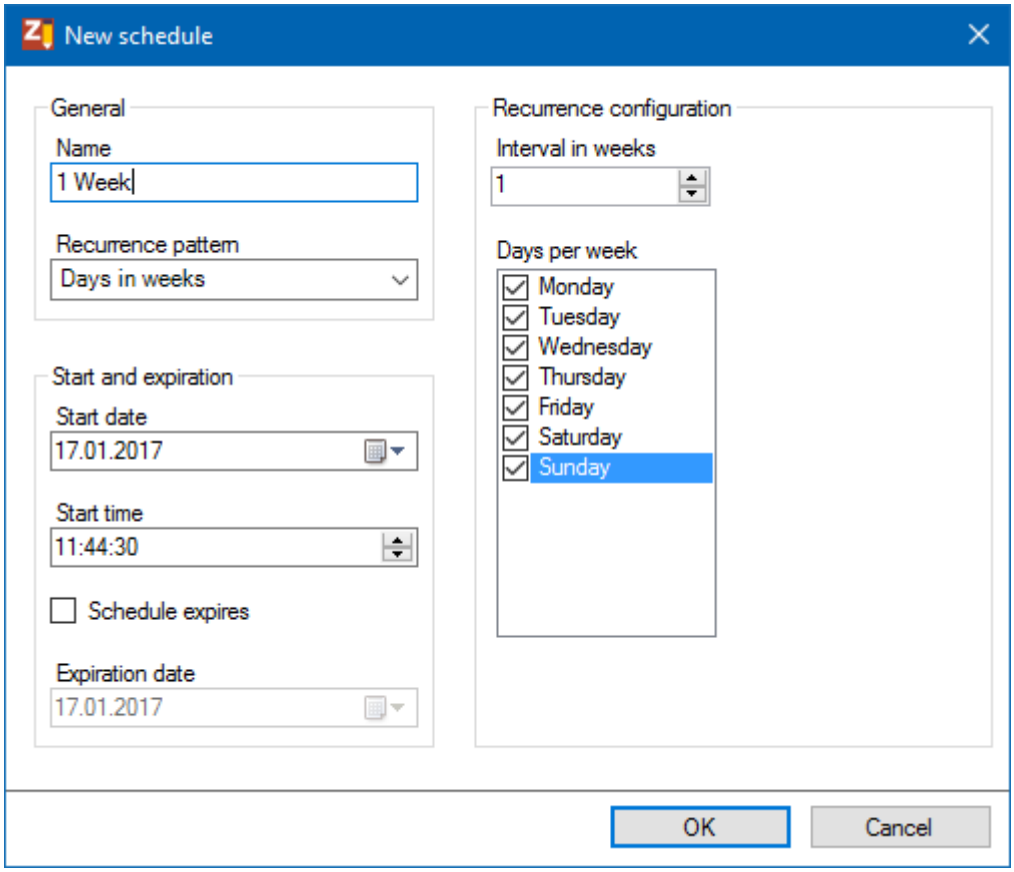
   The dialog is opened with the values for the selected schedule.

**To delete a schedule:**

1. Highlight the desired schedule in the list.
2. Click on **Delete**.

   The schedule is deleted.

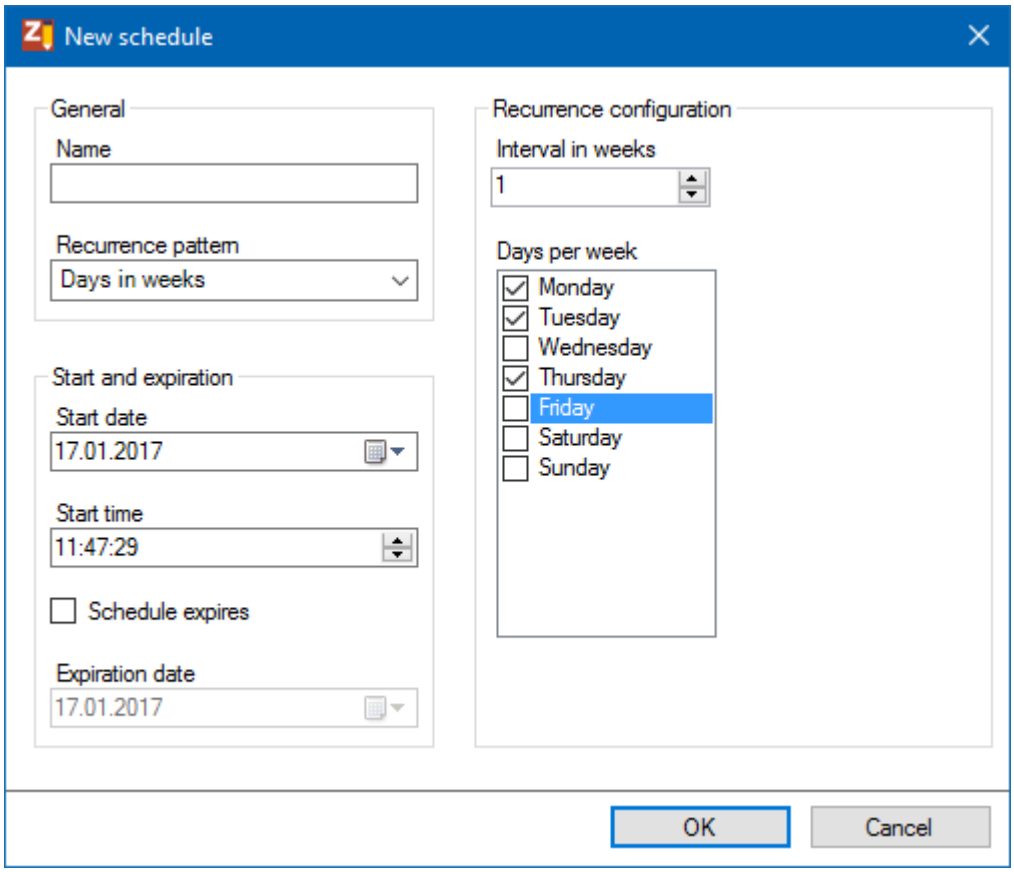
## DIALOG TO CREATE AND EDIT A SCHEDULE



| Option | Description |
|---|---|
| **General** | General settings for the schedule:<br>▸ Name<br>▸ Recurrence configuration |
| **Name** | Name of the schedule. |
| **Recurrence configuration** | Recurrence configuration for the time plan. The following samples are available:<br>▸ Once<br>▸ Minutes and hours<br>▸ Days<br>▸ Days in weeks<br>▸ Days in months<br>▸ Days in weeks of months<br>The patterns are configured in the **Recurrence configuration** section. |
| **Start and expiration** | Start and end times for the plan. |
| **Start time** | Start date. |
| **Start time** | Start time. |
| **Schedule expires** | *Active*: Time plan has a defined date of expiration.<br>Can only be activated if the pattern is not *Once*. |
| **Date of expiration** | Date of expiration. |
| **Recurrence configuration** | Configuration of the recurrences For details, see the "**Configure recurrences**" section. |
| **OK** | Applies the selected configuration and closes the dialog. |
| **Cancel** | Closes the dialog without executing any actions |

Errors during the action prevent the dialog being confirmed with OK and are displayed via messages in the output window.

## CONFIGURING RECURRENCES




### Attention

If an already-configured schedule is called up for editing again, it can happen that the configuration does not correspond to the pattern entered previously. The execution times of the schedule remain the same, only the display of the configuration is affected.

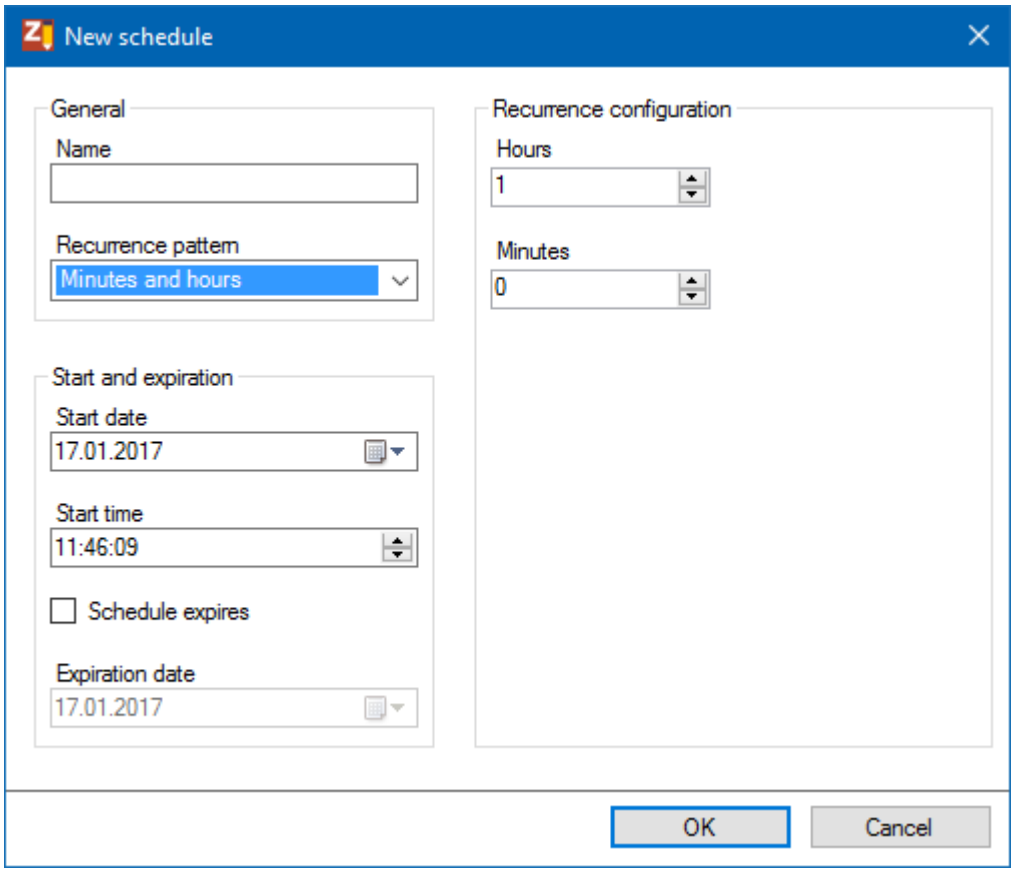
Background: The web service examines the configuration of a schedule and converts it to a simpler pattern, regardless of its configuration.

For example: In *weekdays*, each day was activated and the week interval is set to *1*. The web service makes the simpler pattern *Days* days out of this, with an interval of *1*.

### ONCE

Is only executed once. The settings for **Recurrence configuration** are thus not available.

## MINUTES AND HOURS



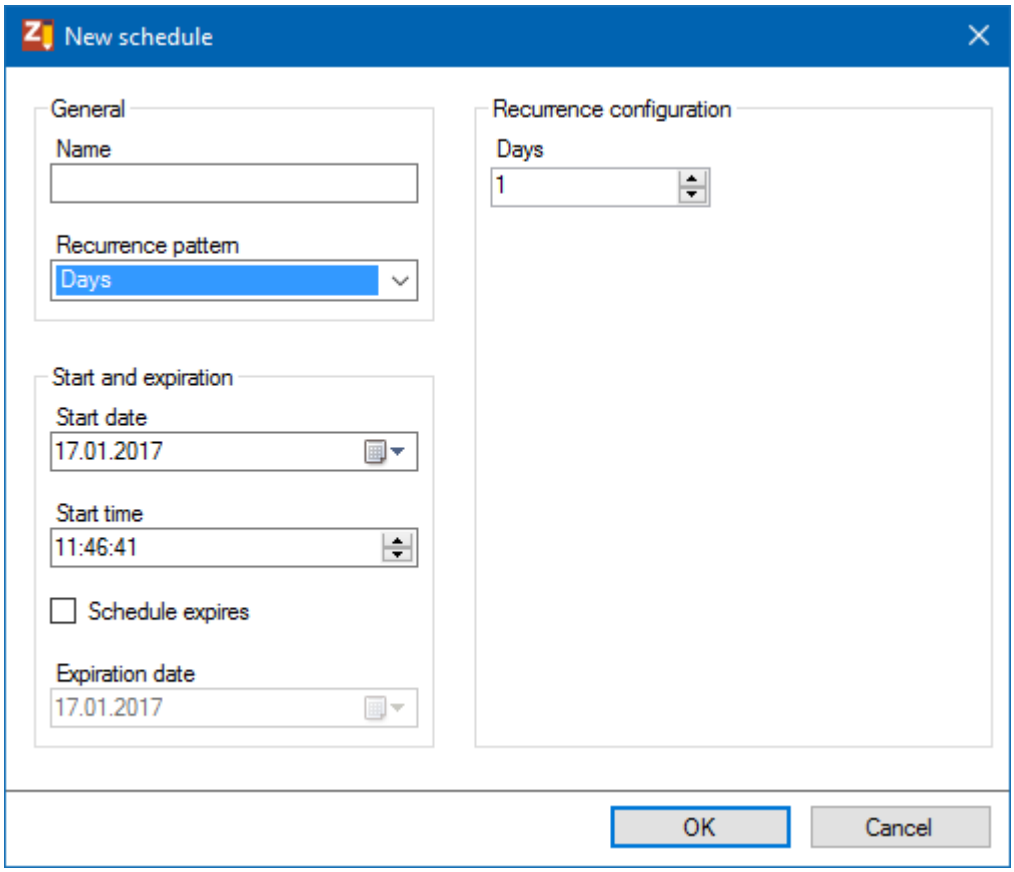

Defines the interval between two executions of the schedule in hours and minutes.

| Option | Description |
|---|---|
| **Hours** | Hours are stated. |
| **Minutes** | Minutes are stated. |

**Note:** If both properties are set to *0*, this leads to an error.

### DAYS

Defines the distance between two executions of the schedule in days.

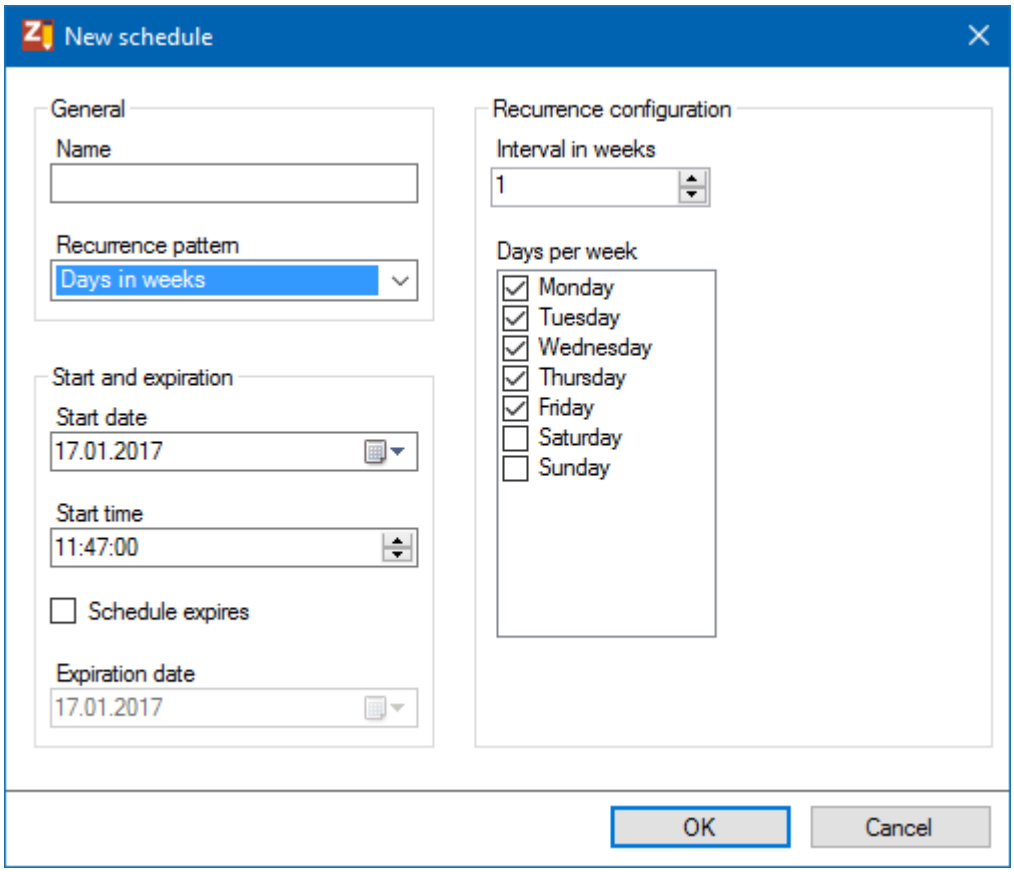



| Option | Description |
|---|---|
| **Days** | number of days between two executions. |

**Note:** If *0* is set, this leads to an error.

### DAYS IN WEEKS

Defines the distance between two executions in weekdays and weeks of execution.



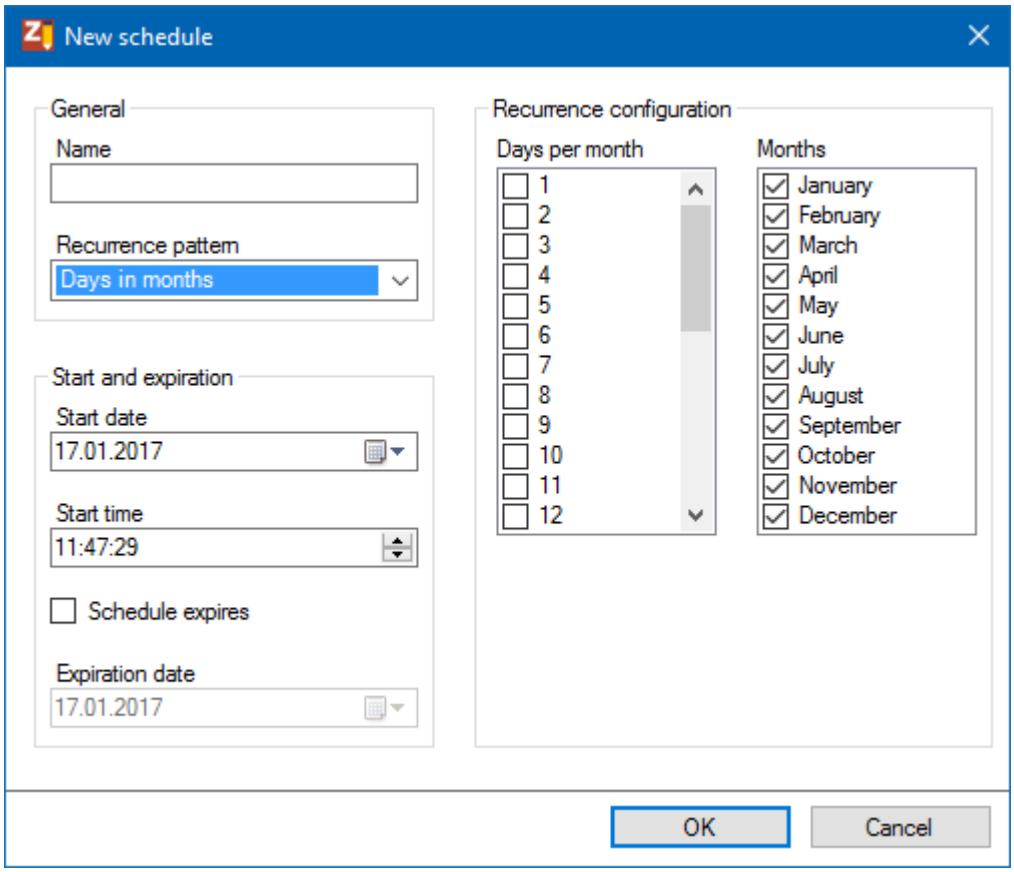

| Option | Description |
|---|---|
| **Interval in weeks** | Interval between the executions in weeks. |
| **Days in weeks** | Weekdays on which the schedule is to be executed. |

Example: A schedule for "*every second Wednesday*" would have Wednesday highlighted as the execution day and a weekly interval of *2*.

**Note:** If no days are highlighted or *0* is set for weeks, this leads to an error.

### DAYS IN MONTHS

Defines the interval between two executions of the schedule over days and weeks of execution.

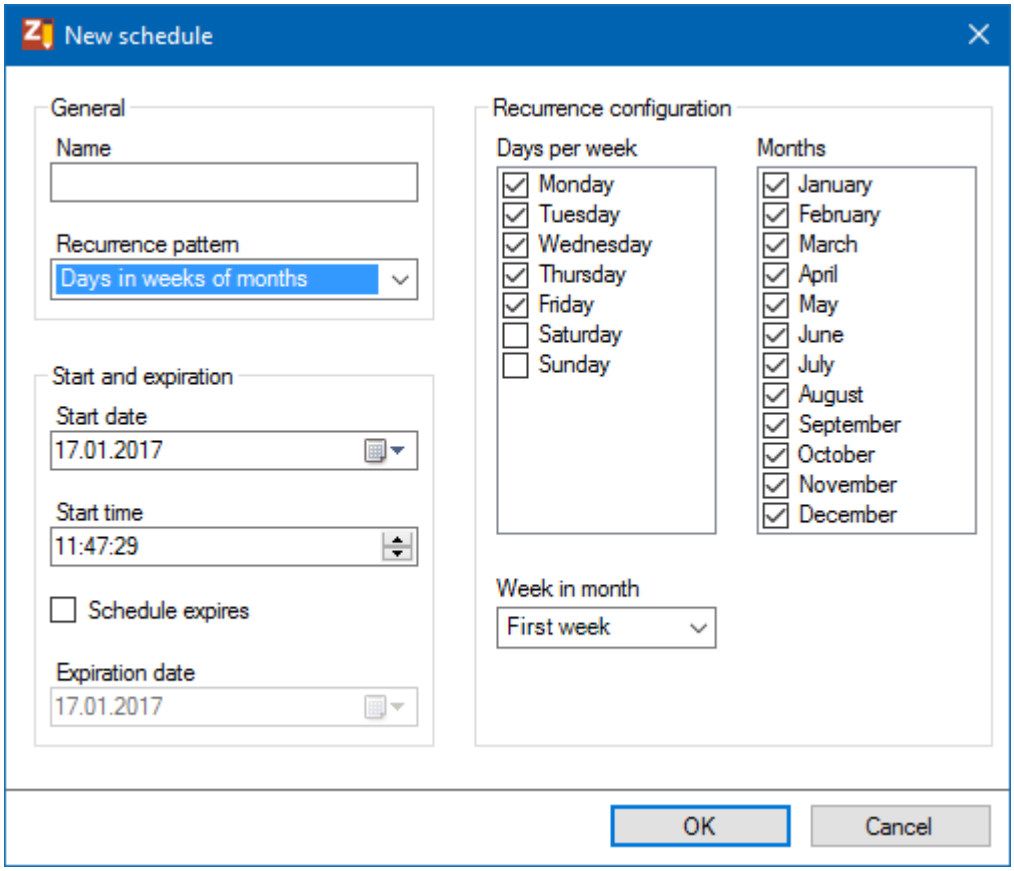



| Option | Description |
|---|---|
| **Days per month** | Activation of the active days via the checkboxes.<br><br>**Note:** The possible execution dates are orientated to the shortest month, February. They are therefore limited to *28*. |
| **Months** | Activation of the active months. |

**Note:** If no entry is activated in one of the properties, this leads to an error.

### DAYS IN WEEKS OF MONTHS

Defines the interval between two executions of the schedule in active weekdays according to week of execution and month of execution.




| Option | Description |
|---|---|
| **Days in weeks** | Selection of the active weekdays. |
| **Month** | Selection of months in which the selected days are active.. |
| **Week in month** | Selection of the week of the active month in which the schedule is executed. |

**Note:** If no entry is activated in one of the properties, this leads to an error.

## LIMITATIONS

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

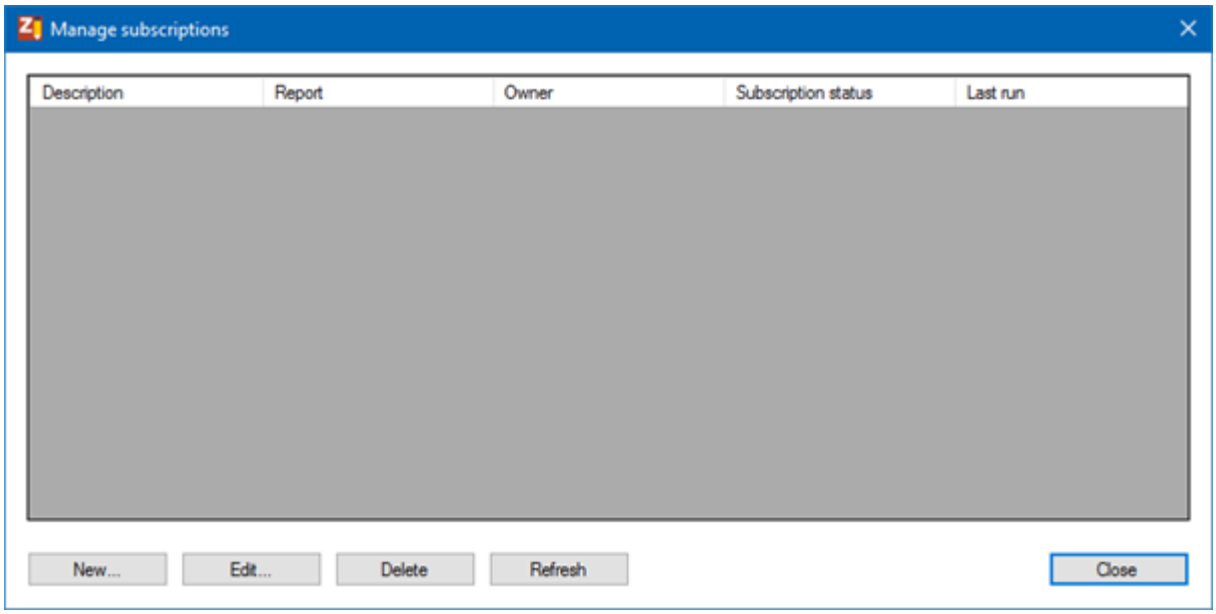
## 8.2 Administer report subscriptions

Prerequisite: In order for reports to be subscribed to, there must be a connection to an Analyzer server with a valid license.

To subscribe to reports:

1. Select the **Subscriptions** entry in the **Options ribbon** in the **Automation ribbon** group.

   The dialog for administering the subscriptions is opened




| Option | Description |
|---|---|
| **List of report subscriptions** | List of the already-configured subscriptions with detailed information:<br>▸ **Description**: Description of the subscription.<br>▸ **Report**: The report used in the subscription.<br>▸ **Owner**: Owner of the subscription.<br>▸ **Subscription status**: Status of the subscription.<br>▸ **Last Run**: Time of the last execution of the subscription. |
| **New** | Opens the dialog to create a new subscription with the default values for all input possibilities.<br>The table with the subscriptions is updated once the opened dialog has been confirmed. |
| **Edit** | Opens the dialog to edit the selected subscription with the values configured for the selected subscription.<br>The table with the subscriptions is updated once the opened |

| Option | Description |
|---|---|
| | dialog has been closed. |
| **Delete** | Deletes the highlighted subscription without asking for confirmation.<br>The table with the subscriptions is updated after the action has been carried out. |
| **Refresh** | Refreshes the **List of report subscriptions**. |
| **Close** | Closes the dialog. |

### Attention

There can be mixes of different languages in all dialogs of this function.

Background: The texts are created by ZAMS, by the web service and also by Microsoft Extension DLLs (for the dispatch methods of the subscriptions). Theses sources support different languages depending on installation and configuration.

## CREATING AND EDITING SUBSCRIPTIONS

**To create a new subscription:**

1. Click on the **New** button.

   The dialog is opened with the default values for all input possibilities.

**To amend an existing subscription:**

1. Highlight the desired subscription in the list.
2. Click on **Edit**.

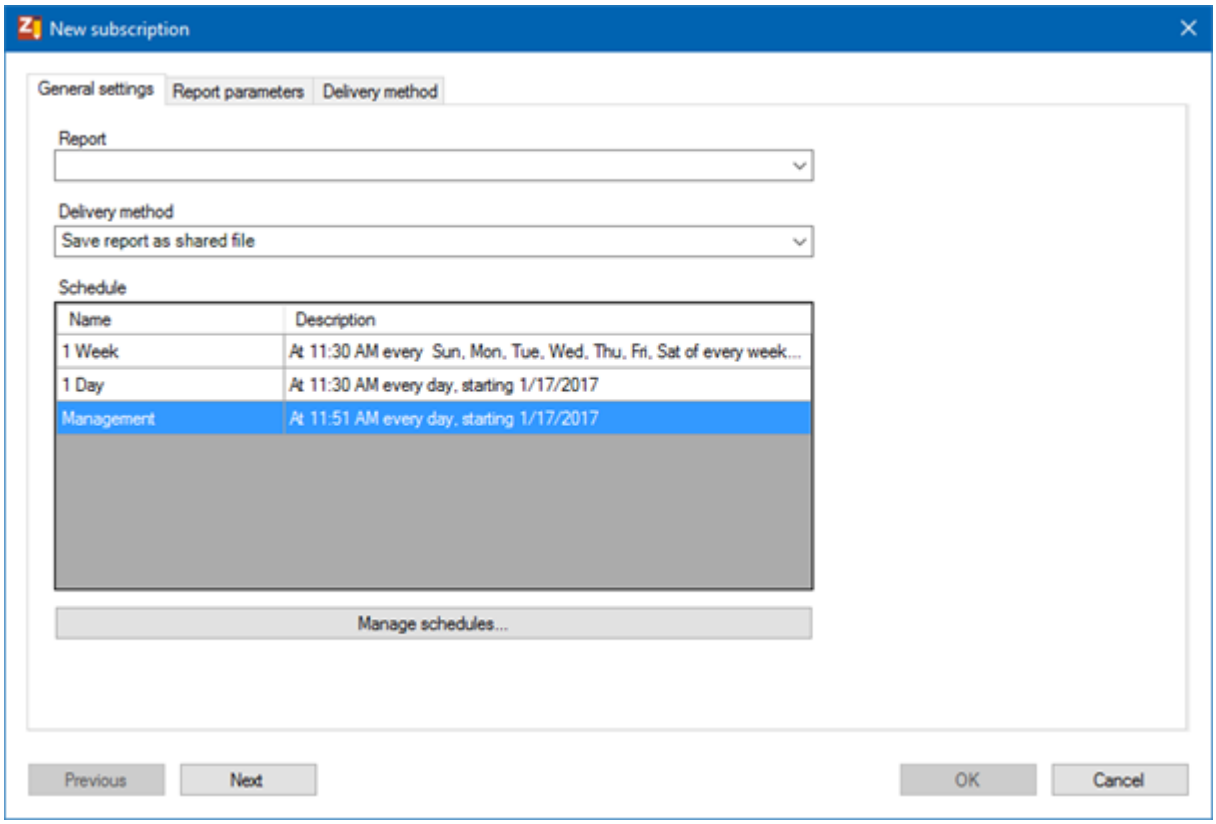
   The dialog is opened with the values for the selected schedule.

**To delete a subscription:**

1. Highlight the desired subscription in the list.
2. Click on **Delete**.

   The subscription is deleted.

## DIALOG FOR CREATING OR EDITING A SUBSCRIPTION



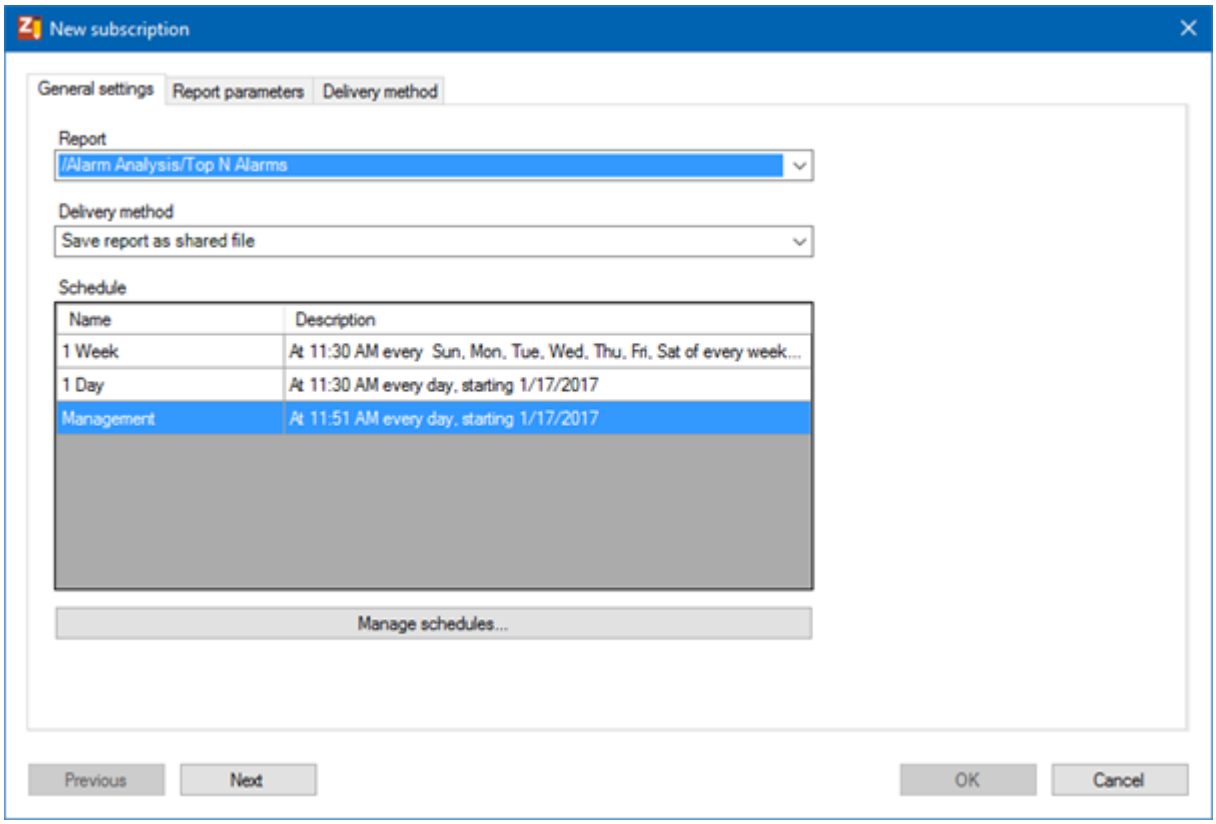

| Option | Description |
|---|---|
| **General settings** (on page 115) | Configuration of the general settings for the subscription. |
| **Report parameter (on page 117)** | Configuration of the parameters for the selected report. |
| **Hinweis Übernahme bisheriger Reportvorlagen (on page 118)** | Configuration of the delivery method for the report. |
| **Previous** | Switches to previous tab.<br>Not active in this tab. |
| **Next** | Switches to the next tab. |
| **OK** | Accepts the configuration, creates the subscription and closes the dialog.<br><br>Only available if no invalid data is present. Input fields with invalid content are stored in red. If the information provided is not valid, the dialog remains open without saving and the erroneous configurations are shown in the output window. |
| **Cancel** | Discards all changes in all tabs and closes the dialog. |

### Hint

You can also furnish a report with the time of report creation. To do this, add the **@timestamp** parameter to the file name in the **Delivery Method** (on page 118) tab.
The report name is then supplemented with the date and time when the report is created. The date and time is always displayed in the format *YYYY_MM_DD_hhmmss*.

## 8.2.1 General Settings

You select the report, delivery method and schedule in this report. You configure report parameters and delivery method in the following tabs.



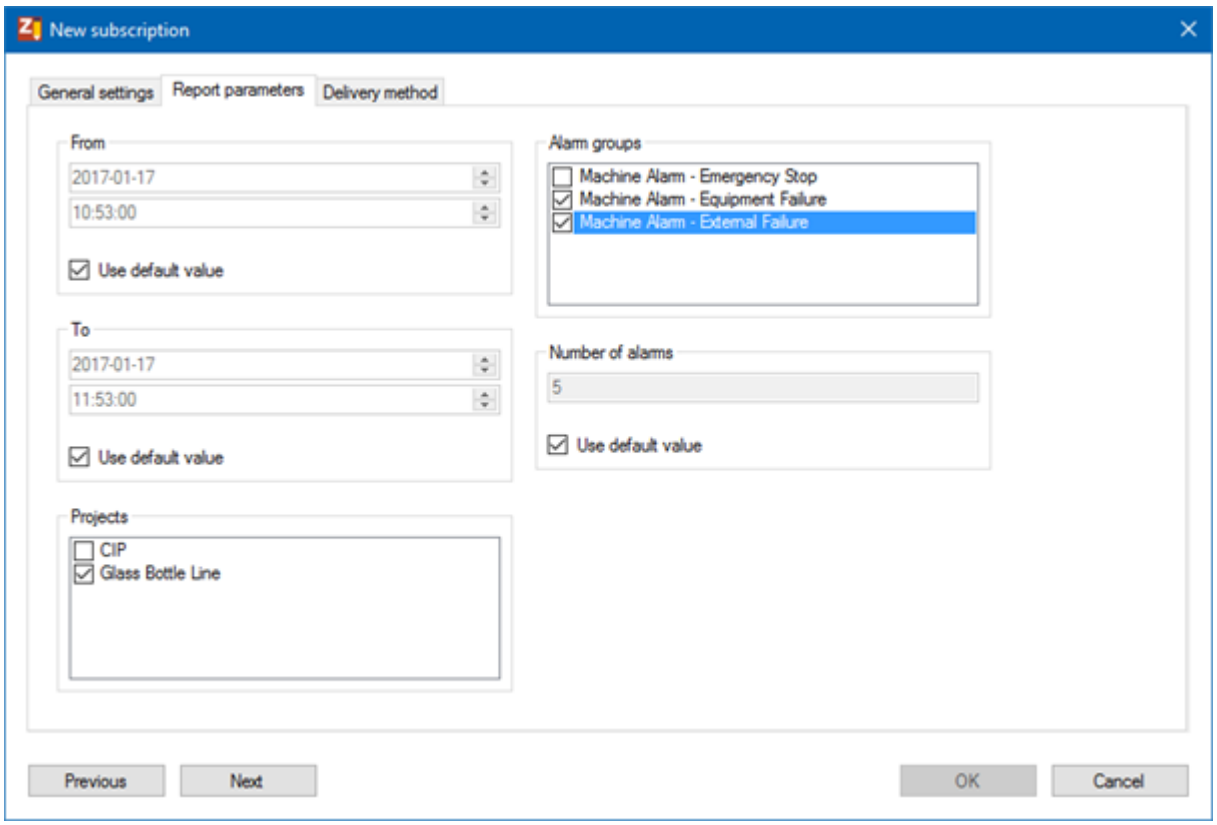

| Option | Description |
|---|---|
| **General Settings** | General settings for the subscription: |

| Option | Description |
|---|---|
| **Report** | Selection of a report for the subscription from a drop-down list.<br>This selection determines which properties are offered in the **Report parameters** group. |
| **Delivery method** | Selection of a method with which the report is sent from a drop-down list:<br>▸ *Save report as shared file*:<br>The report is saved to a network drive in an approved folder.<br>This option is always available. Other options depend on the configuration of the reporting services.<br>▸ *Send report via e-mail*:<br>The report is sent by email.<br>Only available if the reporting services are configured accordingly.<br>This selection determines which properties are offered in the **delivery method** group. |
| **Schedule** | Selection of a schedule for the subscription.<br>**Note:** The schedule for the subscription can be created directly on the Analyzer server and saved with this. This is not supported by ZAMS. |
| **Manage schedules** | Opens the dialog (on page 102) to create ad edit schedules.<br>If this is executed, the table with the schedules is updated in the list of **schedules**. |
| **Previous** | Switches to previous tab.<br>Not active in this tab. |
| **Next** | Switches to the next tab. |
| **OK** | Accepts the configuration, creates the subscription and closes the dialog.<br>Only available if no invalid data is present. Input fields with invalid content are stored in red. If the information provided is not valid, the dialog remains open without saving and the erroneous configurations are shown in the |

| Option | Description |
|---|---|
| | output window. |
| **Cancel** | Discards all changes in all tabs and closes the dialog. |

## 8.2.2 Report parameter

The report parameters are configured in this tab. The control elements are displayed in groups, the groupings are automatically displayed from top to bottom in one or more languages.




| Option | Description |
|---|---|
| **Display of controls** | Depending on the report selected in the **General settings** (on page 115) tab, the respective controls are offered for configuration. The **labels** above the controls for the parameters always come from the report.<br><br>**Recommendation:** In the **Time span** control, activate the **Use standard value** checkbox to use the configured values for the report. |
| **Previous** | Switches to previous tab. |

| Option | Description |
|---|---|
| **Next** | Switches to the next tab. |
| **OK** | Accepts the configuration, creates the subscription and closes the dialog.<br><br>Only available if no invalid data is present. Input fields with invalid content are stored in red. If the information provided is not valid, the dialog remains open without saving and the erroneous configurations are shown in the output window. |
| **Cancel** | Discards all changes in all tabs and closes the dialog. |

### Information

Note for parameters with multiple selection:

- If the checkbox for use of the standard values of the parameters is deselected
- and then all values activated in the selectable list of parameters are deselected,
- Then the standard values are set for these parameters again.

Technical background: The report server sets all parameters that have standard values and are transferred without values back to standard values.

## 8.2.3 Delivery method

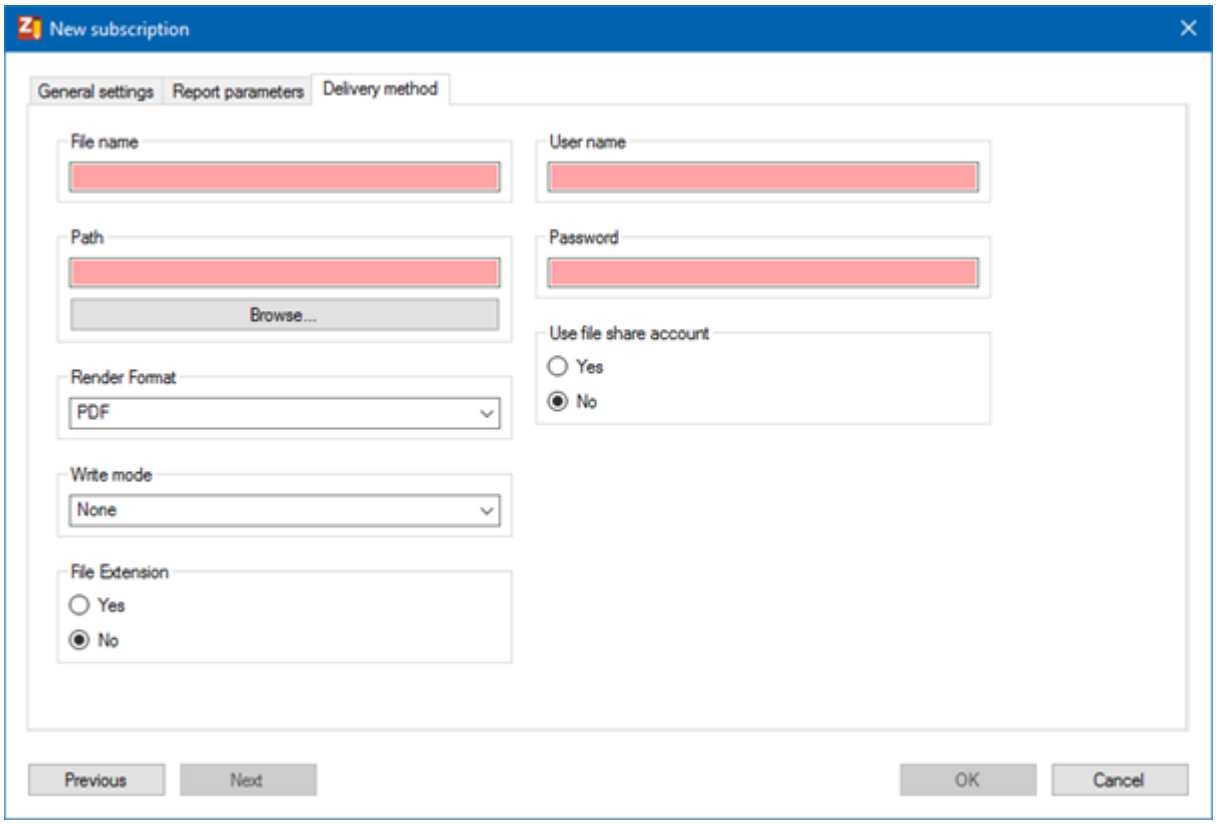
You define the delivery method for the report in this tab. **Save report as an approved file** is always available as a standard method. Other methods depend on the configuration of the reporting services. In this documentation, the **Send report by email** method is also presented in addition to the standard method. The method is selected in the General settings (on page 115) tab.

Entries in this tab are validated each time a parameter value is validated.

### Attention

The language of the parameters for the delivery method corresponds to the language of SQL Server. The language can therefore differ from the configured language. There may also be entries in different languages.

## SAVE REPORT AS SHARED FILE




| Option | Description |
|---|---|
| **File name** | Name of the file in which the report is saved.<br><br>Must not be empty and must contain a valid name.<br>The following characters are not permitted: **/\?\|<>:*"**<br><br>**Hint:** You can also state the time of report creation in the file name. To do this, add **@timestamp** to the name. The date and time is always used in the format *YYYY_MM_DD_hhmmss* .<br>For example: **Monthly_Costs_@timestamp** it will be created on March 15, 2019 at 12:05. The file name will then be called **Monthly_Costs_2019-03-15_120500**. |
| **Path** | UNC path of the authorized folder in which the file is saved. Must not be empty and must contain a valid UNC file path. Clicking on the **Browse** button opens the dialog (on page 347) to select an approved folder on the network drive.<br><br>**Attention:** For technical reasons, it may be necessary to enter a user name and password in the UNC browser dialog. This entry relates to access for approved drives and is not the same as parameter fields for user name and password. |

| Option | Description |
|---|---|
| **Render format** | Selection of the data format from drop-down list for saving the report. |
| **Write mode** | Selection of what is to happen for a pre-existing file from a drop-down list:<br>▸ None: The file is created, but rejected again. Nothing is written.<br>▸ Automatic incrementation: Additional information is written.<br>▸ Overwrite: The file is overwritten. |
| **Filename extension** | Configuration of whether an extension is added to the report file:<br>▸ *Yes*: The file is supplemented with a file extension appropriate to the **render format** property.<br>▸ *No*: The file is saved without a filename extension |
| **User name** | User name for access to the authorized folder.<br>Must be entered in order for the validation to be successful. Only the presence of the input is checked. |
| **Password** | Password for access to the authorized folder. This is not displayed in plain text and is not supplied by the web service when the subscription is called up again.<br>Must be entered in order for the validation to be successful. Only the presence of the input is checked. |
| **Use file share account** | Allows access to central data storage. All subscriptions can be administered centrally with a user.<br>The access data (save location, user name and password) are configured in the **Reporting Services Configuration Manager**.<br>With the delivery method, only whether this save location is used needs to be established:<br>▸ *Yes*: The central save location is used.<br>▸ *No*: Each subscription is administered separately with its own access data. |

### NAVIGATION

| Previous | Switches to previous tab. |
|---|---|
| **Next** | Switches to the next tab. |

| Previous | Switches to previous tab. |
|---|---|
| | Not active in this tab. |

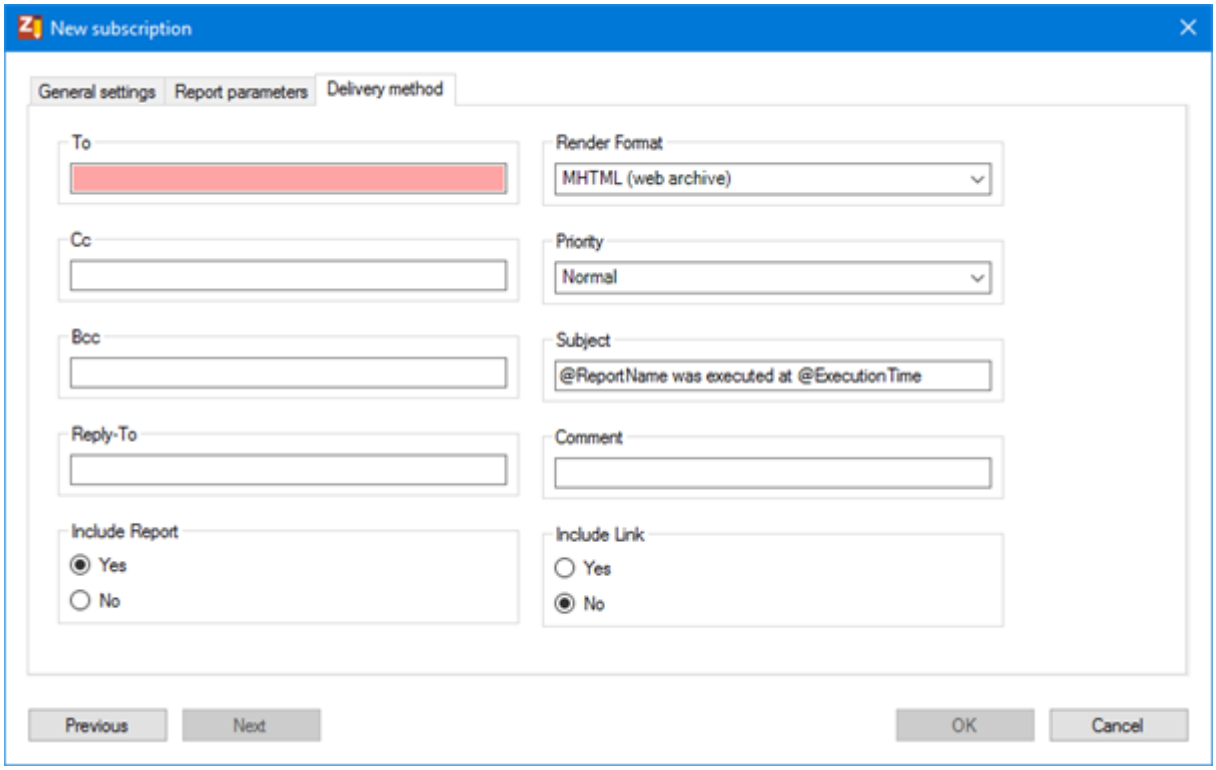
### CLOSE DIALOG

| OK | Accepts the configuration, creates the subscription and closes the dialog.<br>**Only available if no invalid data is present. Input fields with invalid content are stored in red. If the information provided is not valid, the dialog remains open without saving and the erroneous configurations are shown in the output window.** |
|---|---|
| **Cancel** | Discards all changes in all tabs and closes the dialog. |

## SEND REPORT VIA E-MAIL:

In order for reports to be able to be sent by email, the SQL Server must be configured accordingly. Configuration is carried out in ZAMS using the **Email server** (on page 92) entry in the **Analyzer Server** ribbon.

### CONFIGURATION OF THE DISPATCH METHOD



| Option | Description |
|---|---|
| **To** | Address of the recipient.<br><br>Must not be empty and must contain a valid list of email addresses. Requirements for addresses:<br>▸ The following characters are permitted: **a-z, A-Z, 0-9, !#$%&'*+-/=?^_`{\|}~.**<br>▸ Syntax: **[local part]@[domain part]**<br>▸ Several addresses are separated by a semi colon (**;**)<br>▸ Exactly one **@** character in the whole address<br>▸ Two periods (..) must not appear consecutively<br>▸ Rules for local part and domain:<br>- must not start with period (**.**)<br>- must not end with period (**.**)<br>- must contain at least 1 valid character<br>- must not contain any invalid character |
| **Cc** | Address of recipients of copies.<br><br>Can be empty. The content must contain a list of valid email addresses. |
| **Bcc** | Address of hidden recipients of copies.<br><br>Can be empty. The content must contain a list of valid email addresses. |
| **Respond to** | Address to whom a response is to be sent.<br><br>Can be empty. The content must contain a list of valid email addresses. |
| **Include report** | Selection of whether the report is sent.<br>▸ *Yes*: Report is attached to the email as a file.<br>▸ *No*: Only one email is sent, stating that that a report is available. The report itself is not sent.<br>Hint: However a link to the report can be added using the **Include link** option. |
| **Render format** | Selection of the data format from drop-down list for saving the report. |
| **Priority** | Selection of the priority of the email from the drop-down list:<br>▸ Higher<br>▸ Normal<br>▸ low |

| Option | Description |
|---|---|
| **Subject** | Subject of the email The following text blocks can be replaced automatically:<br>▸ **@ReportName**: Name of the report<br>▸ **@ExecutionTime**: Date and time of report creation. |
| **Comment** | Additional text for the email. |
| **Include link** | Selection of whether a link to a report is included in the message.<br>*Yes*: A hyperlink to the report is included in the email.<br>*No*: No hyperlink is included. |
| **Previous** | Switches to previous tab. |
| **Next** | Switches to the next tab.<br>Not active in this tab. |
| **OK** | Accepts the configuration, creates the subscription and closes the dialog.<br>Only available if no invalid data is present. Input fields with invalid content are stored in red. |
| **Cancel** | Discards changes and closes the dialog. |

# 9 Managing SQL Server

You can get to the tools to manage the SQL connections and the databases by means of the **SQL Server** ribbon:

### DATABASE

Create and convert databases.

| Action | Description |
|---|---|
| **New** | Opens dialog (on page 180) to create a new Analyzer database. |
| **Convert** | Starts the conversion (on page 182) of databases, the version number of which is lower than the current version number. |

### DATABASE BACKUP

Backup and restore databases.

| Action | Description |
|---|---|
| **Create** | Opens the dialog (on page 220) for creating a project backup. |
| **Automated** | Opens the dialog (on page 230) to administer the automatically-created database backups. |
| **Restore** | Contains actions to:<br>▸ **Restore**:<br>Opens the dialog (on page 224) for renaming a profile.<br>▸ **Restore as new database**:<br>Opens the dialog (on page 227) for restoring a database backup as a new database.<br>▸ **Restore Reporting Services database**:<br>Opens the dialog (on page 229) for restoring the reporting services database. |
| **Manage files** | Opens the dialog (on page 250) to administer the backup files of the database. |

### ENHANCED BACKUP

Backup and restore databases and reports individually.

| Action | Description |
|---|---|
| **Create** | Selection of enhanced backup for reports or complete backups. Clicking on the respective button opens the dialog (on page 254) to create the enhanced backup. |
| **Restore** | Selection of the restoring of reports or complete backups. Clicking on the respective button opens the dialog (on page 254) to restore the enhanced backup. |

### ADMINISTRATION

Administration tasks.

| Action | Description |
|---|---|
| **Linked Server** | Opens dialog (on page 186) to manage the linked servers. |
| **Metadata indices** | Opens the dialog (on page 195) to manage the metadata indices. |

### DATA PROCESSING

Configuration of connectors and archives.

| Action | Description |
|---|---|
| **SCADA SQL-Connector** | Opens the dialog (on page 126) to create an SQL connector. |
| **3rd party database connector** | Starts the configuration (on page 145) of the connector for third-party databases. |
| **Calculated archives** | Starts the dialog (on page 403) to configure calculated archives. |
| **Emulated archives** | Opens the dialog for configuring the archive emulation (on page 370). |
| **Update SQL Server extensions** | Renews the SQL server extensions (on page 125). The result is displayed in the output window. |

## TIMEOUT CONNECTOR FUNCTIONS

Before each call of a connector function, the set timeout is read from **zenAnalyzer.ini**. This can be amended there if required. Changes are applied immediately. No restarts of processes, services or computers are necessary.

# 9.1 Update SQL Server extensions

This function is available if there is a connection to an Analyzer server with a valid license.

Clicking on the **Update SQL Server extensions** causes the following:

- The database Assembly **zrsUserFunctions** is updated if necessary.
  If it is not present, a new one is created and the attendant SQL UDFs in the database are updated.
- SQL elements are updated if their last change version is higher than the version of the assemblies contained in the database.

**Procedure:**

1. On the currently-connected SQL server instance, all Analyzer databases in the current structure version are found.
2. Call for each database found:
   a) The version of the database assemblies is detected.

      If the version of the database assemblies is greater than or the same as the version of the assemblies to be prepared, the database is not changed. The process for this database is ended.

   b) The database assembly is updated.
      If an error occurs, the process for this database is ended.

   c) All SQL elements in the database are checked.
      If the last change version of the SQL element saved in ZAMS is greater than the version of the database assemblies detected before updating, the SQL element in the database is updated.
3. A status message in the output window informs you of the amount of the databases found for which the update was successful.

Existing SCADA SQL connectors are retained and are not discarded.

## 9.2 Create SCADA SQL connector

A SCADA SQL connector establishes a database connection to certain data from zenon in ZAMS. It can be used by Report Launcher as a data source. In contrast to the SCADA Runtime connector, this data is not provided via a direct connection from zenon. They are exported to a chosen SQL database instead. The data is present there in a format prescribed by zenon. It can be used in a report. To do this, the SCADA SQL connector report configuration must be selected in the **Connector** property.

Data sources from zenon can be:

- Archives and variables
- Alarm message lists (AML)
- Chronological event lists (CEL)
- Shift data
- Context lists

To create an SQL connector:

1. In the **SQL Server** ribbon, in the **Data processing area**, select the **SCADA SQL connector** entry.
2. The dialog to create an SQL connector with both tabs **Databases** and **Projects** is opened

### Information

The following must be the case in order to create an SQL connector:

- There must be a connection to an Analyzer Server with a valid license
- There must be at least one project present with the currently-connected database

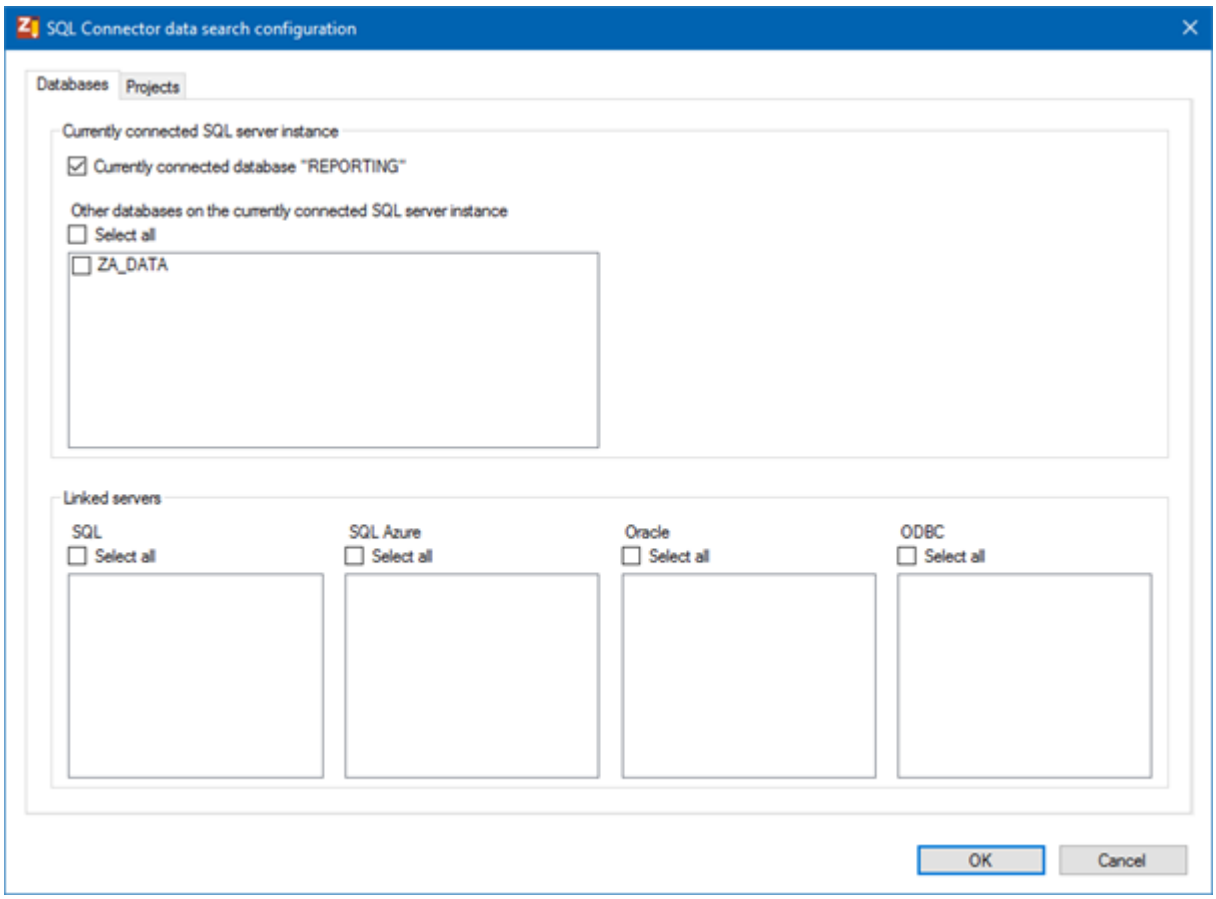
## DATABASES

Selection of databases and linked server where the search for tables is to be made.

### Attention

The following can be neither displayed nor configured:

- Archives that have been imported using the third-party database connector
- emulated archives
- calculated archives



| Option | Description |
|---|---|
| **Currently-connected SQL Server instance** | Properties of the SQL server instance to which ZAMS is currently connected. |
| **Currently-connected database [NAME]** | ▸ *Active*: A search for tables is to be made in the currently-connected database.<br>The name of the database that is currently connected is displayed at the end of the option. |
| **Other databases on the currently connected SQL server instance** | Selection of databases on the SQL server instance that is currently connected where a search for tables is to be carried out.<br>The selection is made by activating the checkboxes:<br>▸ **Select all**: Activates or deactivates checkboxes for all available databases.<br>▸ **Checkbox before database**: Selects or deselects the respective database. |
| **Linked Server** | Linked Server on the SQL server instance to which ZAMS is currently connected. |
| **SQL** | Only contains linked SQL servers.<br>Provider: **SQLNCLI**<br>The selection is made by activating the checkboxes:<br>▸ **Select all**: Activates or deactivates checkboxes for all available databases.<br>▸ **Checkbox before database**: Selects or deselects the respective database. |
| **Azure** | Only contains linked SQL Azure servers.<br>Provider: **SQLNCLI11**<br>The selection is made by activating the checkboxes:<br>▸ **Select all**: Activates or deactivates checkboxes for all available databases.<br>▸ **Checkbox before database**: Selects or deselects the respective database. |
| **Oracle** | Only contains linked Oracle servers.<br>Provider: **OraOLEDB.Oracle** |

| Option | Description |
|---|---|
| | The selection is made by activating the checkboxes:<br>▸ **Select all**: Activates or deactivates checkboxes for all available databases.<br>▸ **Checkbox before database**: Selects or deselects the respective database. |
| **ODBC** | Only contains linked ODBC servers.<br>Provider: **MSDASQL**<br>The selection is made by activating the checkboxes:<br>▸ **Select all**: Activates or deactivates checkboxes for all available databases.<br>▸ **Checkbox before database**: Selects or deselects the respective database. |
| **OK** | Closes the dialog, saves the configuration of both tabs and opens the dialog to configure the SQL connector (on page 133).<br>The parameters are set up via three tabs:<br>▸ **AML, CEL and context list**<br>▸ **Archive tables**<br>▸ **Shift tables**<br>For details, see the corresponding sections. |
| **Cancel** | Cancels the process of creating the SQL Connectors and closes the dialog. |

**Note:** All data sources are activated by default.

## Information

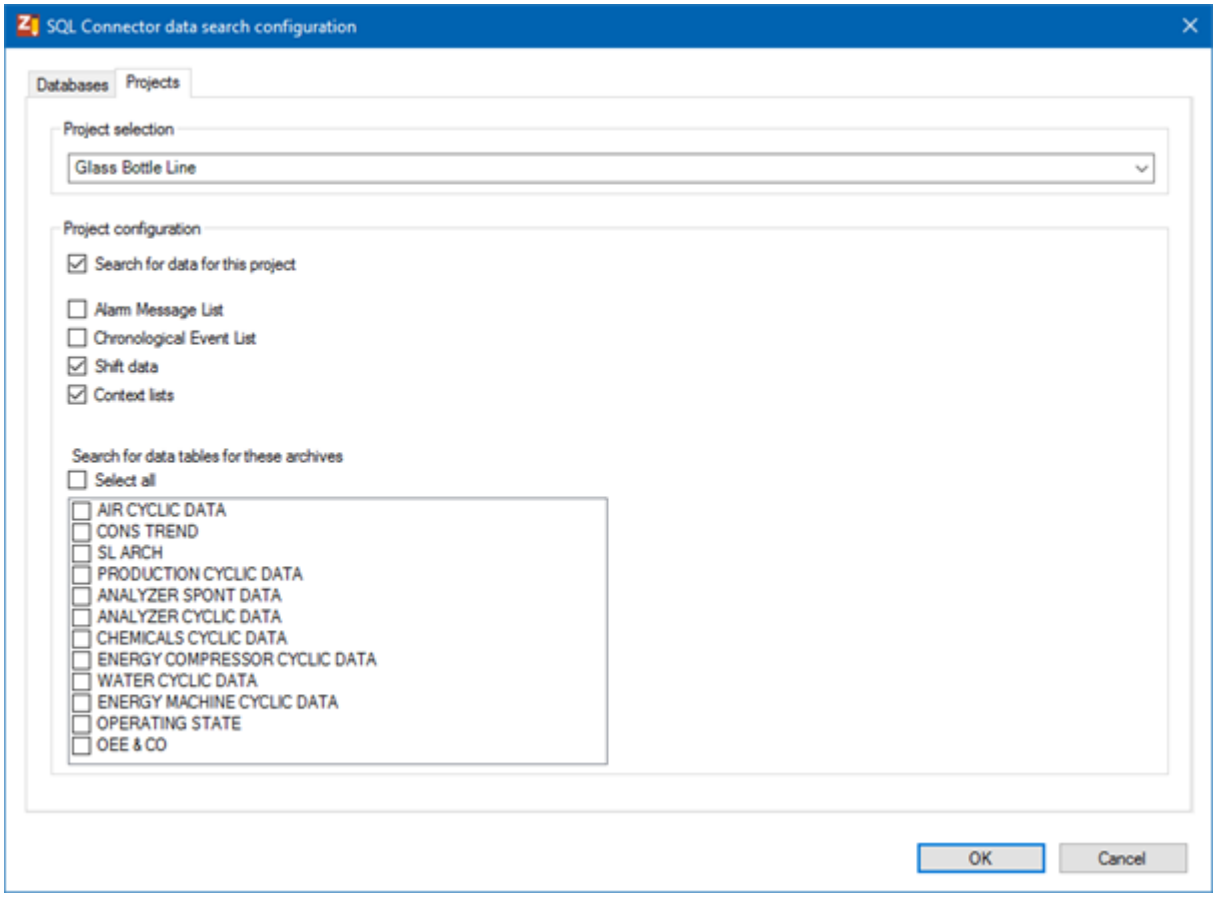
ZAMS can search for importable tables in:

- Databases on the currently-connected SQL Server instance.
- Databases on linked SQL Server instances.
- Via ODBC-linked databases. These are subject to limitations.
  Note: The configuration of the ODBC driver for SQL Server is described in the **Configuration of the provider** (on page 188) chapter.
- Databases on linked Oracle Server
- Databases in MS Azure

The metadata for virtual archives is stored in new metadata tables. **Attention:** With linked SQL Servers, read access to the "**master**" database is required in order to list the databases on the linked SQL Server. With all databases on SQL Server instances, read access to the system views is required in order to be able to recognize the columns and their data types.

## PROJECTS

In this tab, you define the project in which searching for tables and data is to take place. The source databases for the available projects have been stipulated in the **Databases** tab.




| Option | Description |
|---|---|
| **Project selection** | Selection of a project.<br><br>If a project has been selected, the **project configuration** group is filled and can be configured. Configuration can be carried out for each available project.<br>By clicking on **OK**, all configurations for all projects are applied. |
| **Project configuration** | Configuration of the selected project. |
| **Search new data for this project** | ▸ *Active*: A search for tables is made in this project. Further options are shown.<br>▸ *Inactive*: A search for tables is not made in this project. |
| **Alarm Message List** | ▸ *Active*: A search for AML tables is made (table name ends with **_ALARM**). |
| **Chronological Event List** | ▸ *Active*: A search for CEL tables is made (table name ends |

| Option | Description |
|---|---|
| | with **_CEL**). |
| **Shift data** | ▸ *Active*: A search for shift data tables is made.<br>The shift tables to be searched for are taken from the **EQUIPMENTSHIFT** metadata table. |
| **Context lists** | ▸ *Active*: Context lists for alarm causes are searched for. |
| **Search for data tables for these archives** | Selection of the data tables for archives.<br>Tables of the following types are offered:<br>▸ *Archive data*:<br>**[project name]_[short archive description]**<br>▸ *Variables in the archive*:<br>[**project name]_VARIABLES**<br>▸ *Lotsdata*:<br>**[project name]_[archive short description]_LOT**<br>According to this table, a search is only made if the archive in the metadata is defined as a lot archive (**LOTARCHIV** column in the **ARCHIVE** metadata table).<br>The selection is made by activating the checkboxes:<br>▸ **Select all**: Activates or deactivates checkboxes for all available data tables.<br>▸ **Checkbox before database**: Selects or deselects the respective data table. |
| **OK** | Closes the dialog, saves the configuration of both tabs for all configured projects and opens the dialog to configure the SQL connector (on page 133).<br>The parameters are set up via three tabs:<br>▸ **AML, CEL and context list**<br>▸ **Archive tables**<br>▸ **Shift tables**<br>For details, see the corresponding sections. |
| **Cancel** | Cancels the process of creating the SQL connectors and closes the dialog. |

### 9.2.1 Configuration of the SQL Connector

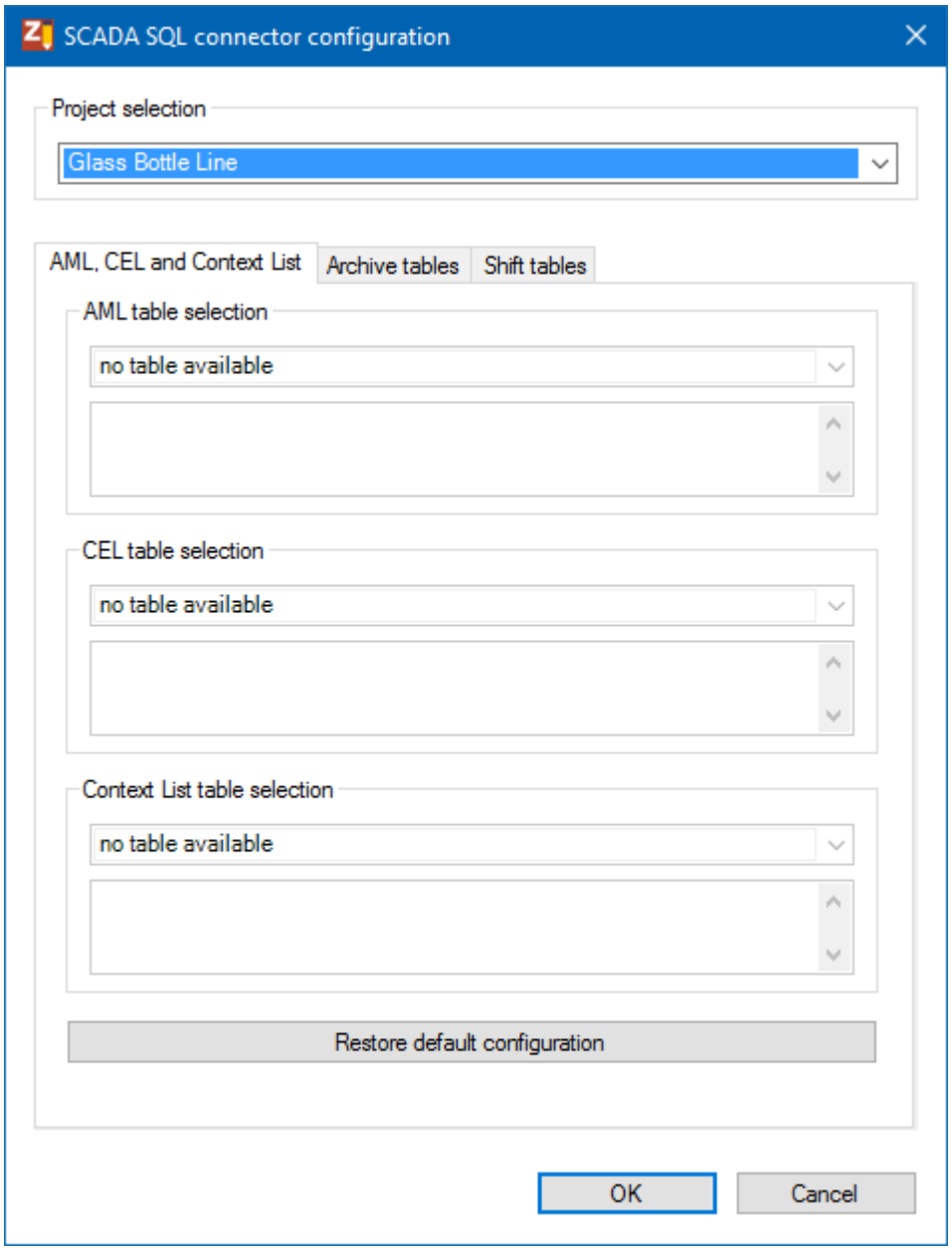
Click on the **OK** button in the dialog for creating an SQL connector to open the dialog to configure the SQL connector. A standard configuration is created for each project before the dialog is opened.

The dialog consists of three tabs:

- **AM, CEL and context list**
- **Archive tables**
- **Shift tables**

The settings are saved after configuration. The last settings saved are displayed the next time the dialog is called up.

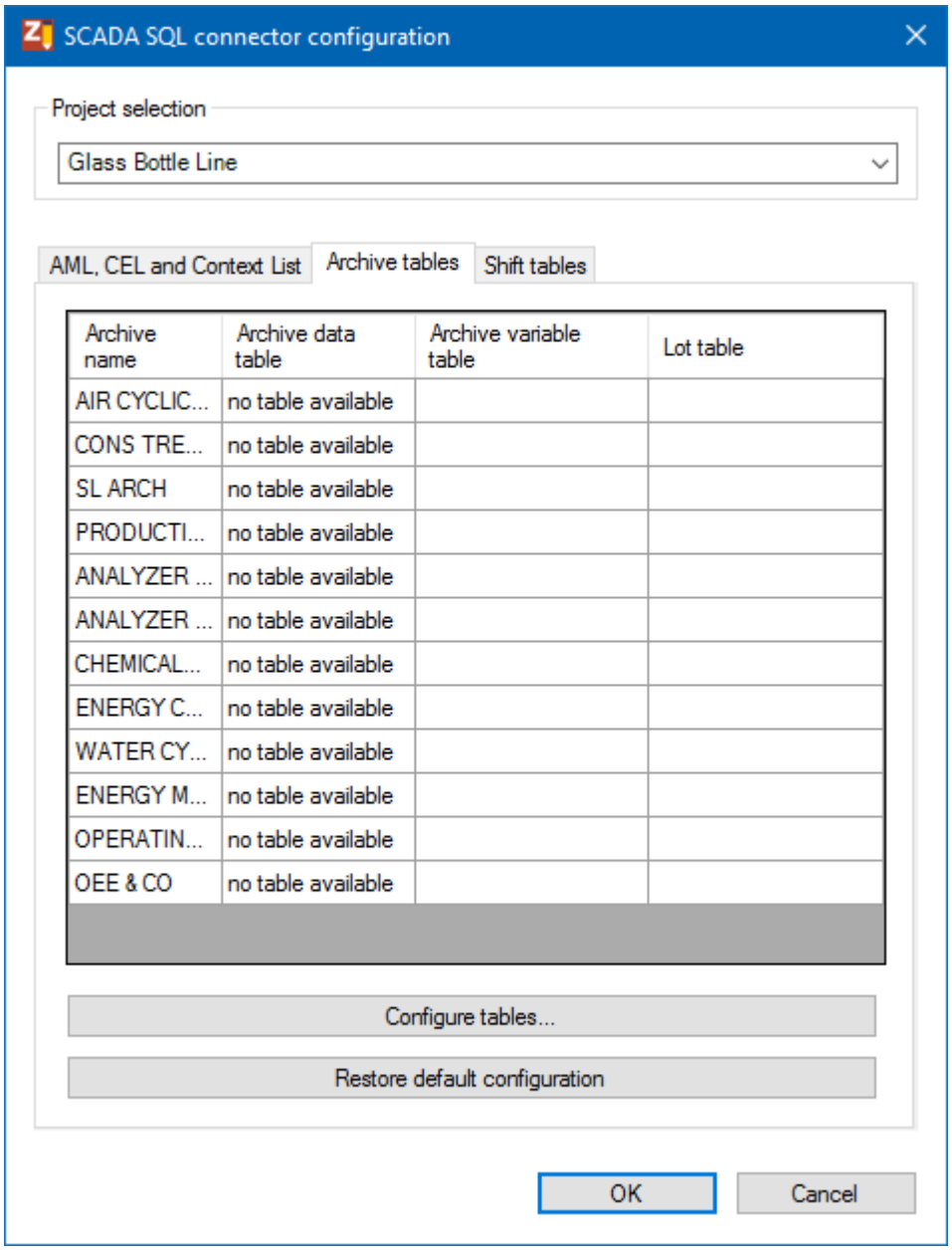
## DIALOG AML, CEL AND CONTEXT LIST




| Option | Description |
|---|---|
| **Project selection** | Selection of the project from the drop-down list makes requirements for the properties to be configured. The selection applies for all three tabs. |
| **AML table selection** | Configuration of the AML table to be used.<br><br>Selection of the desired AML table from the drop-down list. This contains all AML tables found and an entry for *Do not create*.<br><br>The description of the selected table is displayed below the |

| Option | Description |
|---|---|
| | drop-down list. This also informs you if the tables have information in relation to alarm causes (context list).<br><br>**Note:** With connections to an MS Azure server, the **AZURE -** is placed in front of the configuration as a prefix. |
| **CEL table selection** | Configuration of the CEL table to be used.<br><br>Selection of the desired CEL table from the drop-down list. This contains all CEL tables found and an entry for *Do not create*.<br><br>If no tables are found, the drop-down list displays a corresponding entry and is deactivated.<br><br>**Note:** With connections to an MS Azure server, the **AZURE -** is placed in front of the configuration as a prefix. |
| **Context List table selection** | Configuration of the AML table to be used.<br><br>Selection of the desired context list table from the drop-down list. This contains all context list tables found and an entry for *Do not create*.<br><br>The description of the selected table is displayed below the drop-down list.<br><br>**Note:** With connections to an MS Azure server, the **AZURE -** is placed in front of the configuration as a prefix. |
| **Restore default configuration** | Resets all tables for the selected project to the standard configuration. |
| **OK** | Saves settings of all three tabs, closes the dialog and creates the SQL connector. |
| **Cancel** | Cancels the process of creating the SQL connectors and closes the dialog. |

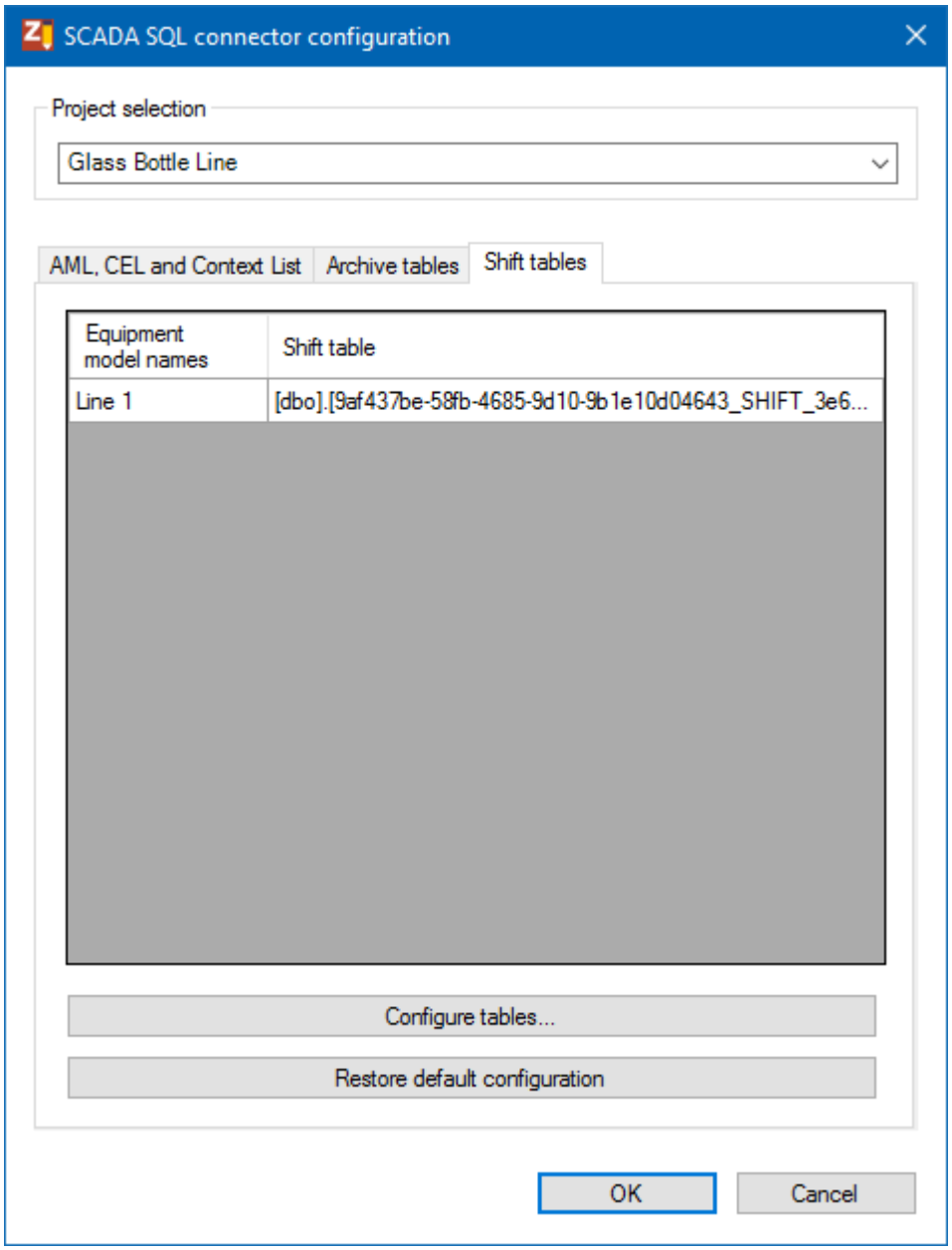
## ARCHIVE TABLE DIALOG




| Option | Description |
|---|---|
| **Project selection** | Selection of the project from the drop-down list makes requirements for the properties to be configured. The selection applies for all three tabs. |
| **List of tables** | Displays all archives that are switched to active when configuring the table search and the respective tables found. The following are displayed:<br>▸ Archive name |

| Option | Description |
|---|---|
| | ▸ Archive data table<br>▸ Archive variable table<br>▸ Lot table<br>If no archive data table is found for an archive or this is not to be integrated into the SQL connector, the columns for the variable table and lot table remain empty. |
| **Configure tables** | Opens the dialog to **Configure the archive tables** (on page 140) for the selected project. The table is updated after this dialog is closed. |
| **Restore default configuration** | Resets the archive tables for all archives of the project currently being displayed back to the standard configuration. |
| **OK** | Saves settings of all three tabs, closes the dialog and creates the SQL connector. |
| **Cancel** | Cancels the process of creating the SQL connectors and closes the dialog. |

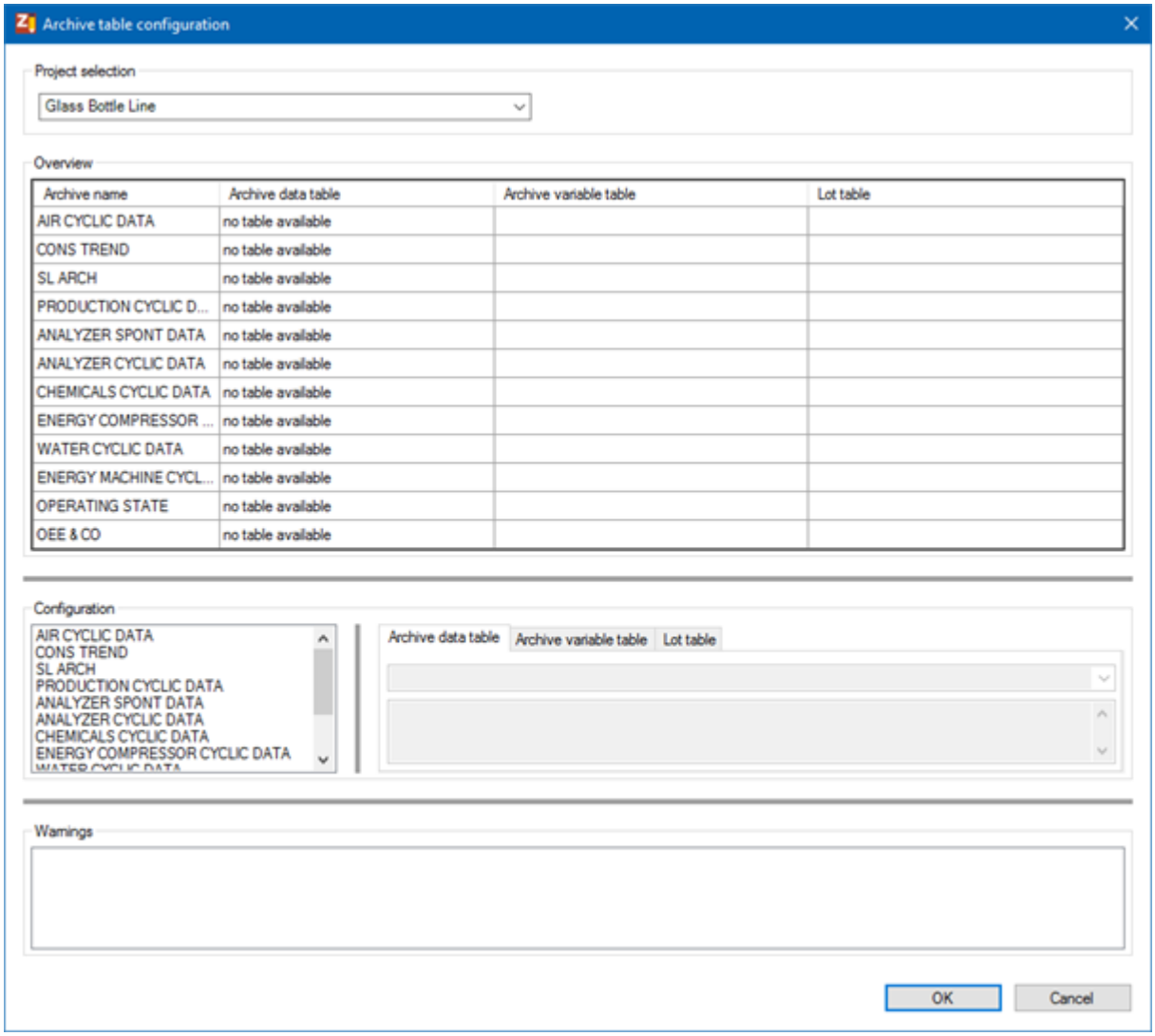
## SHIFT TABLES DIALOG




| Option | Description |
|---|---|
| **Project selection** | Selection of the project from the drop-down list makes requirements for the properties to be configured. The selection applies for all three tabs. |
| **List of shifts** | Displays the shift tables for all equipment groups selected in the configuration. The following are displayed:<br>▸ Equipment group names<br>▸ Shift table |

| Option | Description |
|---|---|
| | If no shift tables were found for an equipment group or these were configured in such a way that they are not incorporated into the SQL connector, this is displayed in the table accordingly. |
| **Configure tables** | Opens the dialog to Configure the shift tables (on page 142) for the selected project. The table is updated after this dialog is closed. |
| **Restore default configuration** | Resets the shift tables for all equipment models of the project currently being displayed back to the standard configuration. |
| **OK** | Saves settings of all three tabs, closes the dialog and creates the SQL connector. |
| **Cancel** | Cancels the process of creating the SQL connectors and closes the dialog. |

## 9.2.2 Configuration of the archive tables

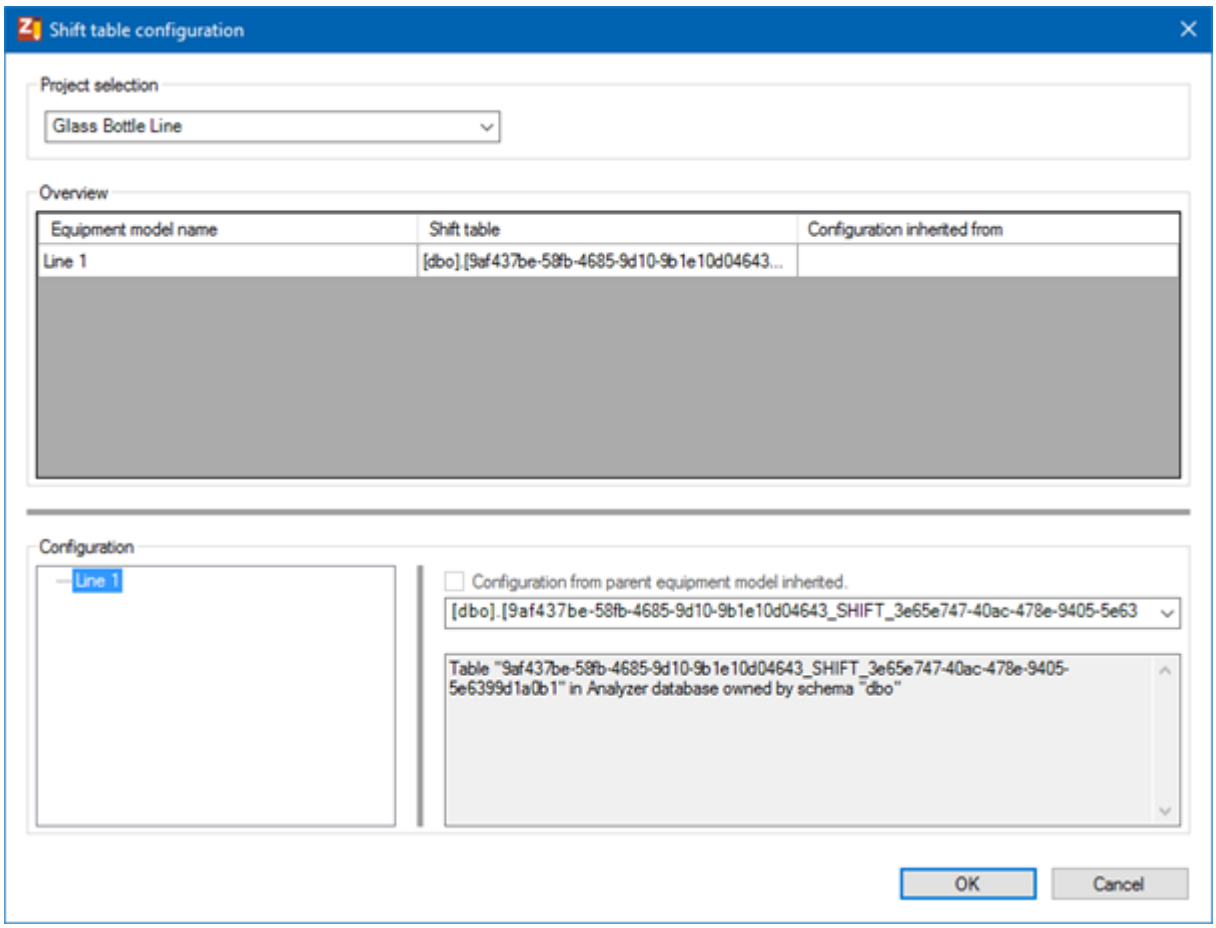



| Option | Description |
|---|---|
| **Project selection** | Selection of the project from the drop-down list. The project selected in **Configuration of the SQL connector** (on page 133) is already selected. |
| **Overview** | Displays the configuration of all archives in the project. The following are displayed:<br>▸ Archive name<br>▸ Archive data table<br>▸ Archive variable table<br>▸ Lot table<br>If no archive data tables are present for an archive, the columns for the |

| Option | Description |
|---|---|
| | archive variable table and the lot table for this archive remain empty. |
| **Configuration** | Configuration of the tables.<br>▸ List on the left-hand side:<br>Selection of an archive to be configured.<br>▸ Tab on the right-hand side:<br>Three tabs to configure the archive data table, the archive variable table and the lot table for the archive selected in the list.<br>**Configuration of the tabs:**<br>Each tab consists of a drop-down list and a text field.<br>If there are no tables, this is noted in the drop-down list and it is inactive.<br>If tables are present, the drop-down list contains all available tables and an entry to exclude the SQL connector (**do not build**).<br>If a table is selected in the drop-down list, the text field displays the description of the table.<br>If the selection in the drop-down list is changed, this has the following effect, depending on the tab:<br>▸ **Archive data table**:<br>If the entry for closing the SQL connector is selected, then this is also changed in the drop-down list for the variable table and the lot table.<br>If a table is selected, then tables are set in the same database for the variable table and the lot table, if these are present.<br>After this, the overview table and the warning list is updated.<br>▸ **Archive variable table**:<br>The overview table and the warning list are updated.<br>▸ **Lot table**:<br>The overview table and the warning list are updated.<br>**Note:** With connections to an MS Azure server, the **AZURE -** is placed in front of the configuration as a prefix. |
| **Warnings** | List of warnings in relation to the configuration Possible reasons:<br>▸ A data table is set and no variable table is set.<br>▸ The variable table is in a database as the data table.<br>▸ A data table is set and it is a lot archive, a lot table is set and the lot table is in a different database to the data table. |

| Option | Description |
|---|---|
| | ▸ A variable table is set, although no data table is set.<br>▸ A lot table is set, although no data table is set. |
| **OK** | Checks to see if the maintenance list is empty.<br>▸ Empty: The dialog is closed and the changes are saved.<br>▸ Not empty: User Query, to find out if the configuration is to be saved despite the warnings:<br>**Nein**: The dialog remains open and the changes to the configuration are not saved yet.<br>**Yes**: The dialog is closed and the changes to the configuration are saved. |
| **Cancel** | Closes the dialog and discards the changes to the configuration. |

## 9.2.3 Configuration of the shift tables



| Option | Description |
|---|---|
| **Project selection** | Selection of the project from the drop-down list. The project selected in **Configuration of the SQL connector** (on page 133) is already selected. |
| **Overview** | Displays the configuration of all equipment models and all equipment groups for which a shift table is defined in the metadata for this project. The following are displayed:<br>▸ **Equipment model name**<br>▸ Shift table<br>▸ **Configuration of inheritance**: Contains, with equipment models and equipment groups with active inheritance of the shift table, the name of the superordinate element. The construction of the inheritance hierarchy is explained in the warning bx under this table.<br>If no tables are found for an equipment model or this is excluded by the SQL connector, this is noted in the corresponding line in the 'Shift table' column. |
| **Configuration** | Consists of:<br>▸ **List with equipment models**: Complete connection hierarchy of the equipment models for the project set<br>▸ Checkbox for configuration applied from parent equipment model.<br>▸ **Drop-down list**<br>▸ **Text field** |
| **List of equipment models** | Selection of an equipment model by clicking on the desired model. |
| **Configuration from parent equipment model inherited.** | ▸ *Active*: Configuration is taken on by superordinate element.<br>Can only be activated if it is not a root element in the inheritance hierarchy of the equipment model for the selected project. |
| **Drop-down list for shift table** | Configuration of the shift table for the selected equipment model.<br>▸ If there are no shift tables for the equipment model, this is displayed in the drop-down list and the list is set to inactive.<br>▸ If the shift table is inherited by a superordinate entry, then the inherited shift table is entered into the drop-down list |

| Option | Description |
|---|---|
| | and the list is set to inactive.<br>▸ In all other cases, the shift table can be configured and the drop-down list shows all shift tables available for the selected equipment model and an entry to exclude the equipment model from the SQL connector. If a change is made in the drop-down list, this is forwarded to all equipment models that inherit from the selected equipment model.<br>**Note:** With connections to an MS Azure server, the **AZURE -** is placed in front of the configuration as a prefix. |
| **Text field** | Contains the description of the shift table selected in the drop-down list. |
| **OK** | Saves all changes to the configuration and closes the dialog. |
| **Cancel** | Discards all changes to the configuration and closes the dialog. |

When the dialog is opened, the inheritance hierarchy of the equipment model for each project is created and a decision is made on which inheritances are active.

### Attention

This hierarchy does not need to correspond to the hierarchy in the equipment model in the zenon Editor, because the shift tables entered in the metadata are also taken into account here. The following decision-making guidelines were used in the process:

- An equipment model can only inherit the shift table configuration from another equipment model Y if the equipment model X in the zenon is a direct child of equipment model Y and the collection of the available shift tables is identical for each equipment model.
- If an element cannot inherit from any other, it it becomes a root element for the **Equipment model list**.
- A possible inheritance is then active if an element and its superordinate element are configured for use of the same shift table.

## 9.3 Create 3rd party database connector

Third-party database connectors can also be configured in ZAMS. To do this, tables and shifts from third-party databases are shown as virtual archives in ZAMS. These virtual archives are incorporated into reports as archives, along the same lines as SCADA archives and emulated archives.

ZAMS amends the metadata in the metadata database during configuration. No usage data at all is stored in the Analyzer metadata database. The usage data is read directly from the source table each time there is a read request for a virtual archive.

For data from Oracle and Azure, schemes that cannot be used are filtered out beforehand.

### Information

ZAMS can search for importable tables in:

- Databases on the currently-connected SQL Server instance.
- Databases on linked SQL Server instances.
- Via ODBC-linked databases. These are subject to limitations.
  Note: The configuration of the ODBC driver for SQL Server is described in the **Configuration of the provider** (on page 188) chapter.
- Databases on linked Oracle Server
- Databases in MS Azure

The metadata for virtual archives is stored in new metadata tables. **Attention:** With linked SQL Servers, read access to the "**master**" database is required in order to list the databases on the linked SQL Server. With all databases on SQL Server instances, read access to the system views is required in order to be able to recognize the columns and their data types.

In order to be able to create a **3rd party database connector**, there must be a connection to an Analyzer server with a valid license.

### Information

For virtual archives (on page 370) with the **3rd party database Connector**, the data source must be **Archive**. Variables from these archives are not available for the data sources **AML** or **CEL**.

### CREATE CONNECTOR

To create a **3rd party database connector**:

1. In the **SQL server** ribbon in the **Data processing** area, select the **3rd party database connector** entry.

2. Confirm the selection by clicking **OK** The dialog for the **selection of available databases** (on page 147) is opened.
3. Select the desired databases.
4. The dialog for configuration of the **archives for the 3rd party database connector** is opened.
5. Configure the archives with the wizard (on page 152) or manually (on page 165).
6. The archives are displayed in the **archives for the 3rd party database connector** and can be edited.
7. Confirm the dialog by clicking on **OK**.

   The archives are created and can be used in reports.

> **Information**
>
> Inputs in text fields are evaluated during configuration. Dialogs can be confirmed with **OK** if there are no validation errors.
>
> In general, the following applies:
>
> - The following are not permitted for display name, names, references identifications and meanings: Comma (**,**) and simple apostrophe (**'**).
> - The following is not permitted for descriptions, units and status text: Comma (**,**)
>
> Errors are explained in pop-up messages.

## LIMITATIONS FOR DATA FROM ODBC SOURCES

The following limitations apply to data that is incorporated via ODBC:

- The data type of the variables is always defined by the data type of the value column. This concerns the value column of the table for *Variable identification column and value column* and the value column of the variables for *One value column for each variable*. These cannot be selected in the dialog.
- An error is reported if the following conditions are applicable:
  - Data for an archive whose source table is connected via ODBC is queried.
  - The table is a *variable identification column and value column* table.
  - The variables in the archive have different data types.
- The value range is limited for numeric values:
  - All values that are greater than $10^{10}$ are processed as $10^{10}$.
  - All values that are in the range of $-(10^{-10})$ to $10^{-10}$ are processed as 0.
  - All values that are less than $-(10^{10})$ are processed as $-(10^{10})$.

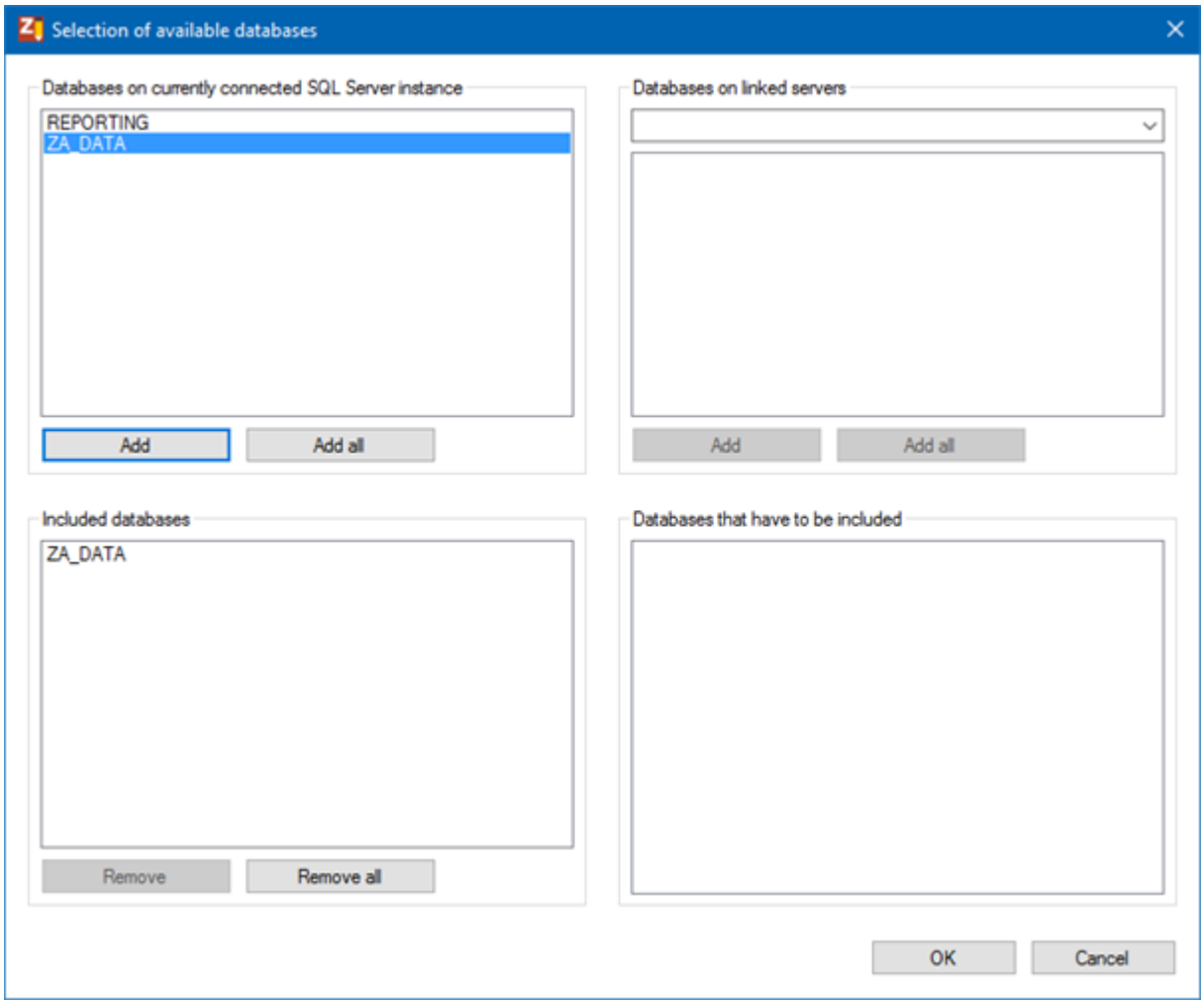
### "ORAOLEDB.ORACLE" FOR LINKED ORACLE SERVER

3rd party data archives for Oracle linked servers are queries using the **OPENQUERY** mechanism. For details, see the **Configuration of the provider** (on page 188) chapter.

## 9.3.1 Selection of available databases

In the dialog for the **Selection of available databases**, the databases that are to be searched for importable tables are selected. These can then be configured in the **Archives for the 3rd party database connector** dialog.

### SELECTION OF AVAILABLE DATABASES




| Option | Description |
|---|---|
| **Databases on currently connected SQL Server instance** | Display of databases on the currently-connected SQL server instance. Multiple selection is possible. Selected databases are added to the **Included** |

| Option | Description |
|---|---|
| | **databases** list by clicking on the **Add** button. |
| **Add** | Adds all databases selected in the list to the **Included databases** list. Only databases that are not already in the **Included databases** list or in the **Databases that have to be included** are added. |
| **Add all** | Adds all databases present in the list to the **Included databases** list. Only databases that are not already in the **Included databases** list or in the **Databases that have to be included** are added. |
| **Databases on linked servers** | Selection of a linked server from a drop-down list and display of its databases in the list. Multiple selection is possible.<br><br>Selected databases are added to the **Included databases** list by clicking on the **Add** button<br><br>If the linked server is an **ODBC** server, no database can be selected. A database identification text is inserted into the list instead. This constitutes the database for this linked server.<br><br>If there are problems with the connection to the linked ODBC servers:<br>▸ Check whether the linked server has the correct system DSN and whether the correct login data has been entered. Also check the content of the system DSN.<br>▸ Check whether the ODBC driver for SQL servers (name: **MSDASQ**L) has the correct settings. For the settings, see the **Configuration of the provider** (on page 188) chapter. |
| **Add** | Adds all databases selected in the list to the **Included databases** list. Only databases that are not already in the **Included databases** list or in the **Databases that have to be included** are added. |
| **Add all** | Adds all databases present in the list to the **Included databases** list. Only databases that are not already in the **Included databases** list or in the **Databases that have to be included** are added. |

| Option | Description |
|---|---|
| **Included databases** | Display of all databases added. These are searched for importable tables by clicking on **OK**. Multiple selection is possible.<br>Databases can be removed from the list by clicking on the **Remove** button.<br>Databases that come from linked servers are shown in the syntax **[Linked Server Name] [database name]**. |
| **Remove** | Removes all selected databases from the list. |
| **Remove all** | Removes all existing databases from the list. |
| **Databases that have to be included** | Display of all databases that must be searched for importable tables because an existing virtual archive refers to them. The list is only displayed and cannot be edited.<br>Databases that come from linked servers are shown in the syntax **[Linked Server Name] [database name]**. |
| **OK** | Accepts all settings, closes the dialog, searches all selected databases for importable tables and opens the **Archives for the 3rd party database connector** dialog.<br>An error message is shown if the **Included databases** and **Databases that have to be included** lists are empty. |
| **Cancel** | Discards all configurations and closes the dialog. |

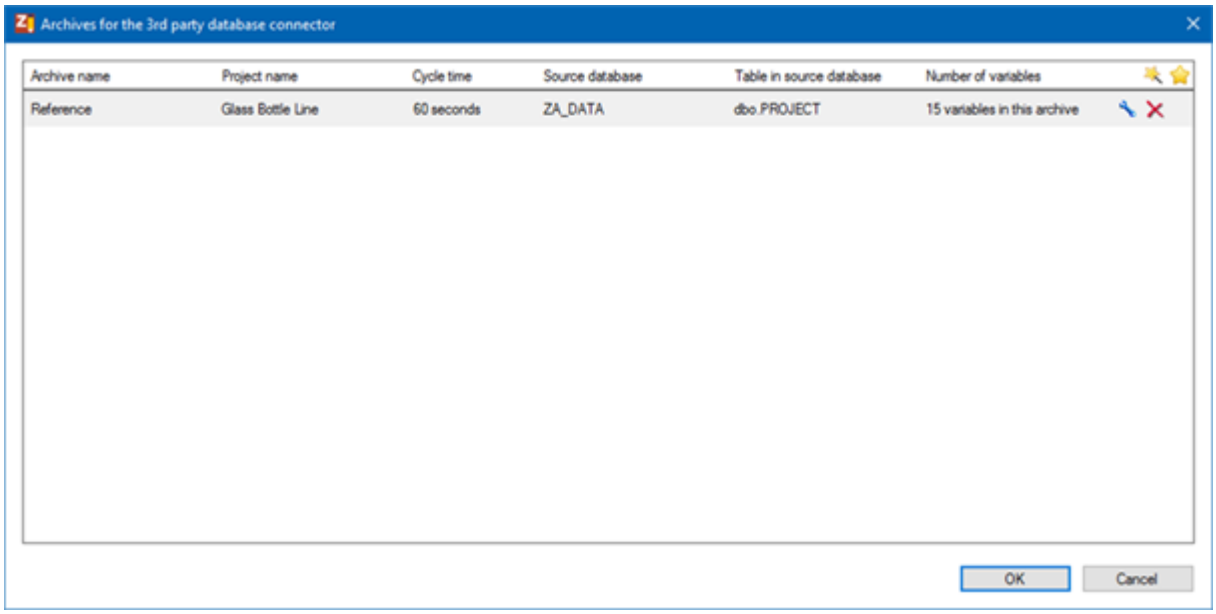
## ARCHIVES FOR THE 3RD PARTY DATABASE CONNECTOR DIALOG

Configuration of the archives for the imported databases. Create new archives with the wizard or manually and edit existing archives.

The following symbols are used in the dialog:

- **: Wizard**
- **: New**
- **: Edit**

- ✕: **Delete**

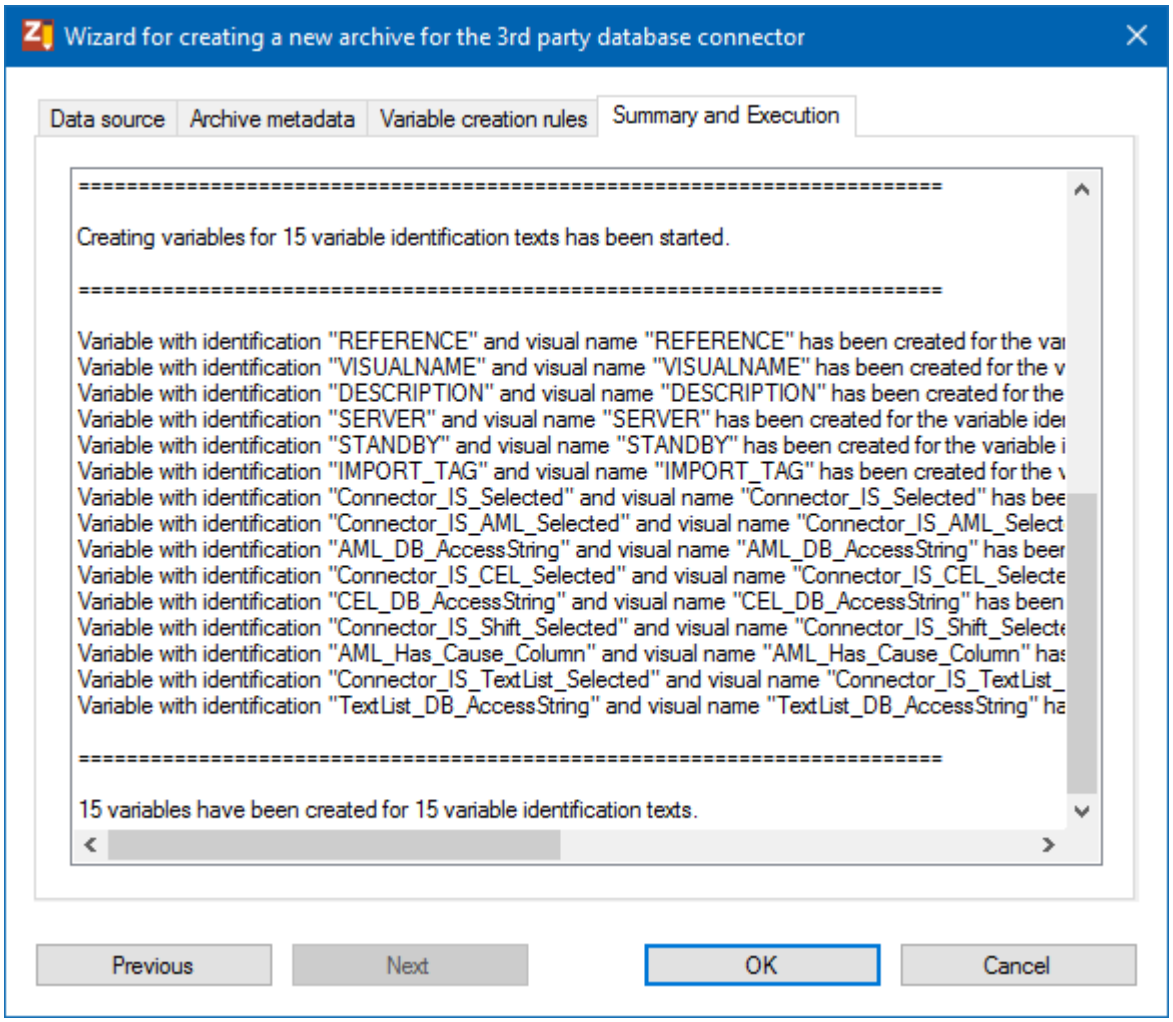



| Option | Description |
|---|---|
| **List of archives** | Display of the configured archives with the following detailed information:<br>- **Archive name**<br>- **Project name**<br>- **Cycle time**<br>- **Source database**<br>- **Table in source database**<br>- **Number of variables**<br>The archives are displayed in the order of their creation: |
| **Buttons to edit the list and the archives** | The following symbols are available for editing:<br>**Bar:**<br>- **Wizard**: Opens the wizard (on page 152) for creating an archive. Once an archive has been created, the dialog to edit an archive is automatically opened. Amend the created archive here<br>- **New**: Opens the dialog (on page 165) for creating an archive.<br>**Archives:** |

| Option | Description |
| --- | --- |
| | ▸ **Edit**: Opens the dialog to edit an archive. This corresponds to the dialog (on page 165) to create an archive. However no new variables can be created.<br>▸ **Delete:** Deletes the archive without requesting confirmation. |
| **OK** | Applies all settings and closes the dialog. |
| **Cancel** | Discards all settings and closes the dialog. |

## 9.3.2 New archive with wizard

Archives, data sources and rules are established with the archive and the variables are then created automatically. These can then be amended individually.



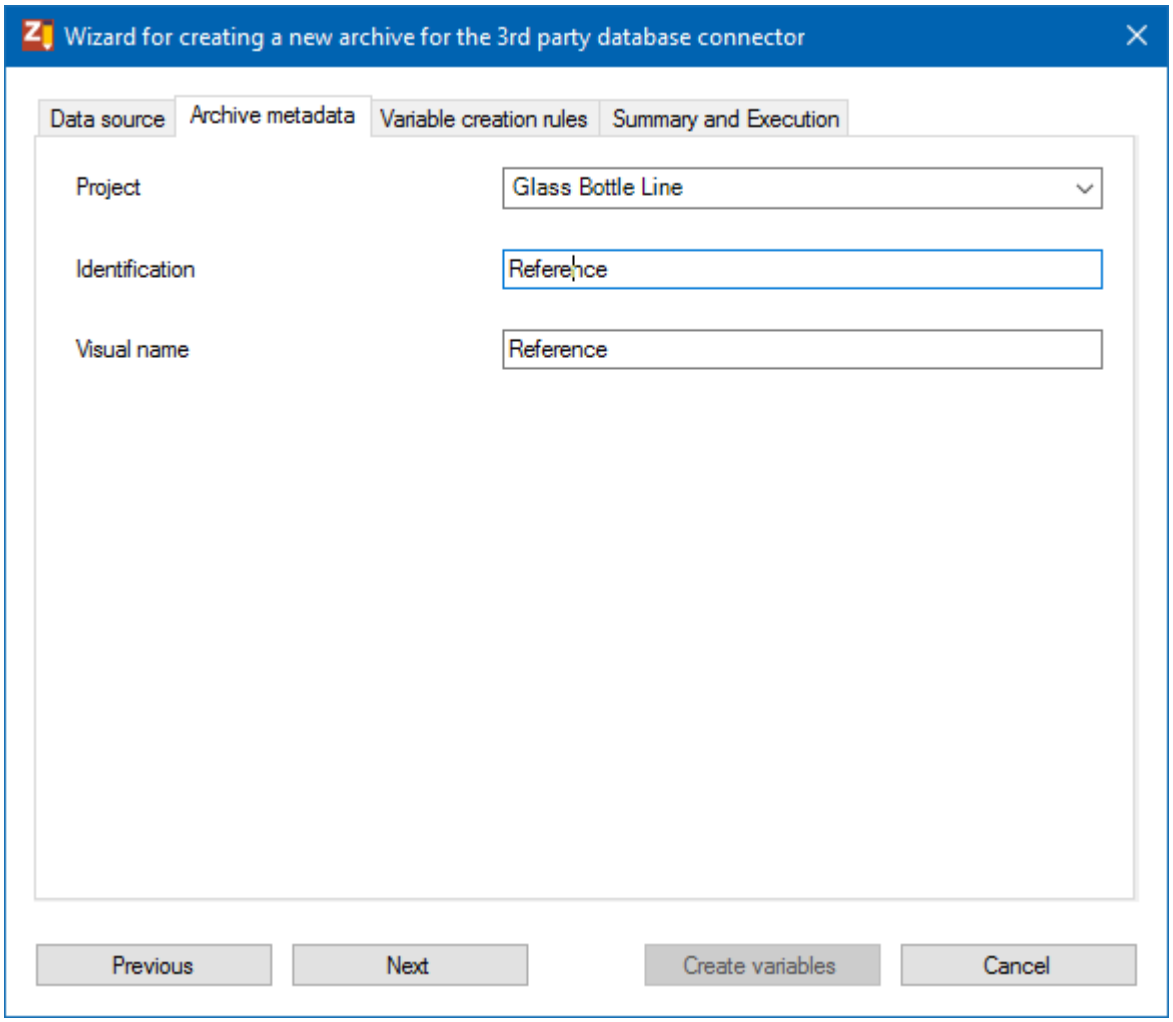

To create a new archive with the wizard:

1. Click on the symbol for the wizard in the **Archives for the 3rd party database connector** dialog.
2. Configure the tabs:
   - Data source (on page 155)
   - Archive metadata (on page 153)
   - Variable creation rules (on page 158)
3. Check the configuration in the Summary and Execution (on page 160) tab.
4. Click on Create variables.
5. The configured variables are created.

6. The dialog to create/edit an archive (on page 165) is opened.
7. Amend the automatically-created configuration as required.
8. Close the dialog.
9. The archive is displayed in the list and can be opened using the **Edit** symbol for further amendments at any time.

### 9.3.2.1 Archive metadata

Configuration of the archive metadata:




| Option | Description |
|---|---|
| **Project** | Project that is assigned to the archive. Select from drop-down list. |
| **Identification** | Archive reference. This must be unique for all archives within the project. |

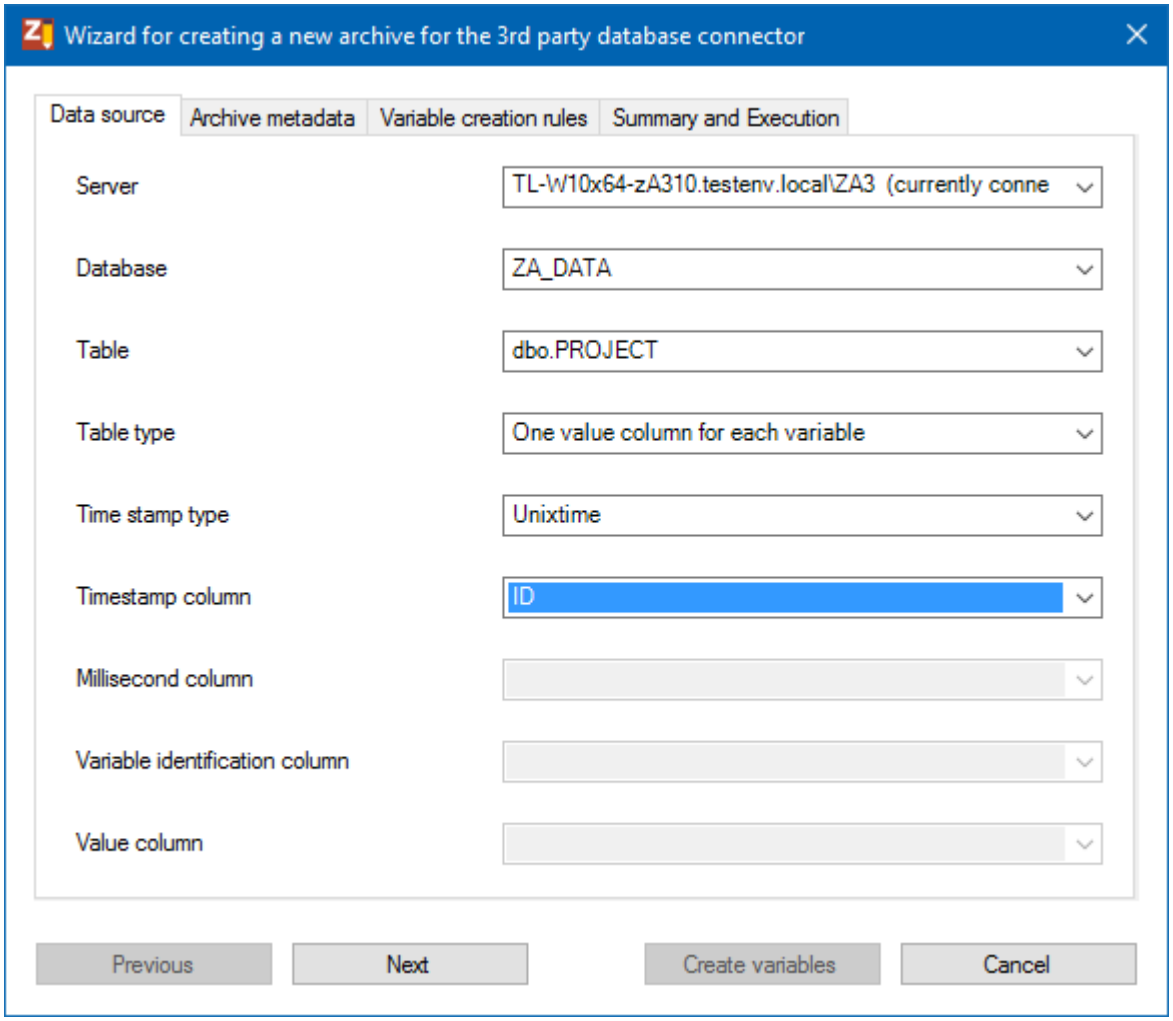
| Option | Description |
|---|---|
| | The field must not be empty during validation. |
| **Visual name** | Visual name for the archive. This must be unique for all archives within the project.<br>The field must not be empty during validation. |

## NAVIGATION

| Button | Description |
|---|---|
| **Previous** | Switches to the previous tab.<br>Inactive in the first tab. |
| **Next** | Switches to the next tab.<br>Inactive in the last tab. |
| **Create variables** | Starts variable creation.<br>Only active in the last tab and only if no validation error has been established. If validation errors are found, these are displayed and the button remains inactive.<br>Once the variable has been created, the button changes to **OK**. The creation of the archive can thus be started. |
| **Cancel** | Discards all inputs and closes the dialog. |

### 9.3.2.2 Data Source

Configuration of the data source:




| Option | Description |
|---|---|
| **Server** | Selection of the database server from a drop-down list. The currently-connected server instance is identified by the suffixed note **(currently connected)**.<br><br>If the selection is changed during the configuration of the tab, the settings of this tab that depend on this are reset.<br><br>The field must not be empty during validation. |
| **Database** | Selection of the database on the selected **server** from a drop-down list. All databases of the selected server are available.<br><br>Only available if a **Server** has been selected. |

| Option | Description |
|---|---|
| | If the selection is changed during the configuration of the tab, the settings of this tab that depend on this are reset.<br>The field must not be empty during validation. |
| **Table** | Selection of the source table from a drop-down list. All tables present in the selected database are available.<br>Only available if a **Database** was selected.<br>If the selection is changed during the configuration of the tab, the settings of this tab that depend on this are reset.<br>The field must not be empty during validation. |
| **Table type** | Selection of the table type from a drop-down list. Available are:<br>▸ *Variable identification column and value column*: flat list<br>▸ *One value column for each variable*: pivoted<br>Only available if a **table** was selected.<br>If the selection is changed during the configuration of the tab, the settings of this tab that depend on this are reset.<br>The field must not be empty during validation. |
| **Time stamp type** | Selection of the time stamp from the drop-down list. Available are:<br>▸ UTC timestamp object<br>▸ Timestamp object in server local time<br>▸ Unixtime<br>▸ Unixtime and milliseconds in two columns<br>▸ Unixtime and milliseconds in one column<br>Only available if a **table** was selected.<br>If the selection is changed during the configuration of the tab, the settings of this tab that depend on this are reset.<br>The field must not be empty during validation. |
| **Timestamp column** | Selection of the time stamp column from a drop-down list. All columns of the selected table whose data type is |

| Option | Description |
|---|---|
| | permitted for the current time stamp setting are available.<br>Only available if a **table** was selected.<br>The field must not be empty during validation. |
| **Millisecond column** | Selection of the millisecond column from a drop-down list. All columns of the selected table whose data type is permitted for a millisecond column are available.<br>Only available if a **table** has been selected and *Unix time with milliseconds* has been selected as a **time stamp type**.<br>The field must not be empty during validation if it is active. |
| **Variable identification column** | Selection of Variable identification column from drop-down list. All columns of the selected table whose data type is permitted for a variable identification column are available.<br>Only available if a **table** has been selected and *Variable identification column and value column* has been selected as a **table type**.<br>The field must not be empty during validation if it is active. |
| **Value column** | Selection of value column from drop-down list. All columns of the selected table whose data type is permitted for a value column are available.<br>Only available if a **table** has been selected and *Variable identification column and value column* has been selected as a **table type**.<br>The field must not be empty during validation if it is active. |

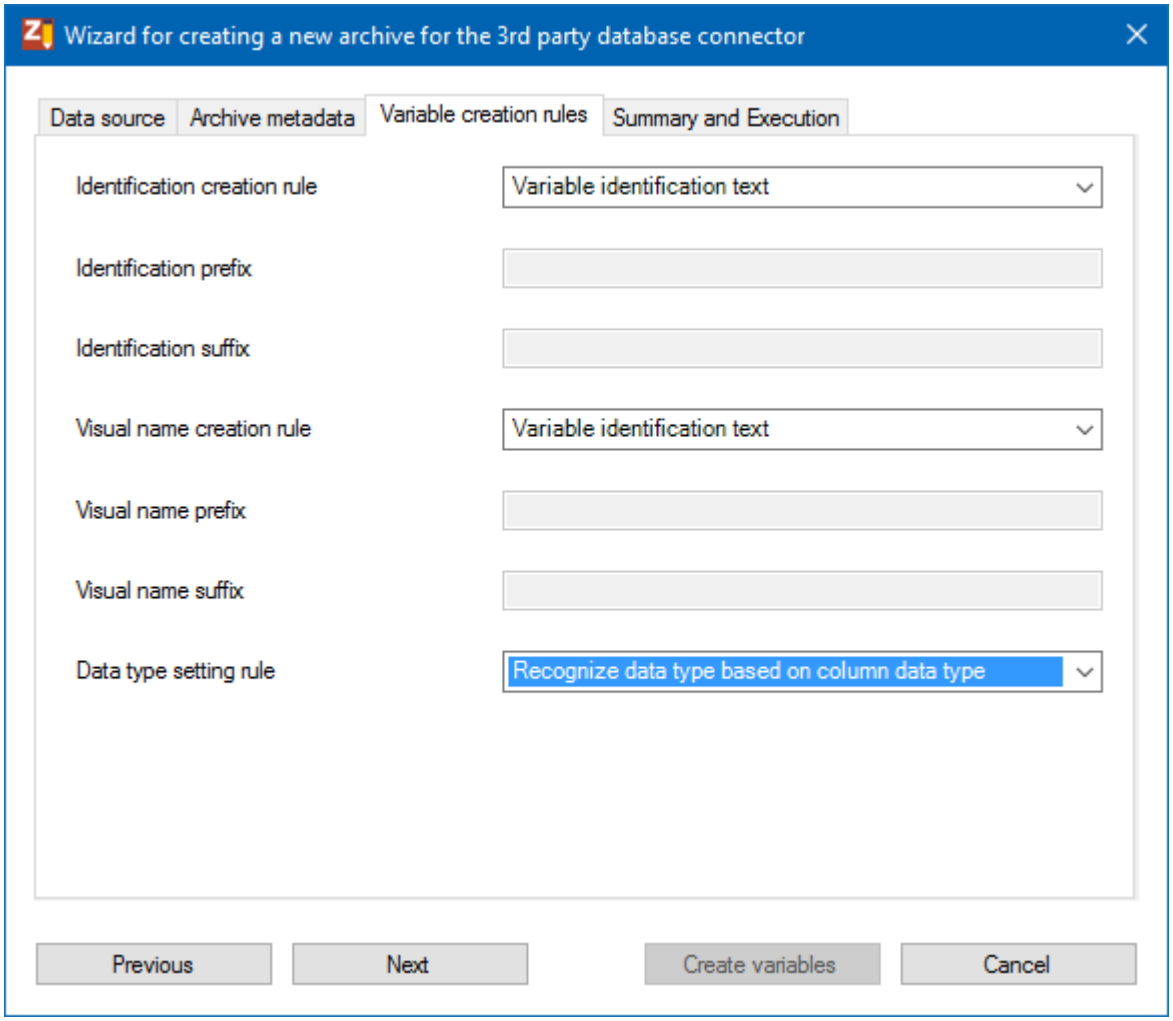
## NAVIGATION

| Button | Description |
|---|---|
| **Previous** | Switches to the previous tab.<br>Inactive in the first tab. |
| **Next** | Switches to the next tab.<br>Inactive in the last tab. |
| **Create variables** | Starts variable creation.<br>Only active in the last tab and only if no validation error has |

| Button | Description |
|---|---|
| | been established. If validation errors are found, these are displayed and the button remains inactive.<br><br>Once the variable has been created, the button changes to **OK**. The creation of the archive can thus be started. |
| **Cancel** | Discards all inputs and closes the dialog. |

### 9.3.2.3 Variable creation rules

Configuration of the rules for the creation of variables:




| Option | Description |
|---|---|
| **Identification creation rules** | Configuration of how the variable reference is created. This must be unique within the project and comply with the rules |

| Option | Description |
|---|---|
| | (on page 174) for names. Select from drop-down list:<br>▸ *Variable identification text*<br>▸ *Variable identification text with prefix*<br>▸ *Variable identification text with suffix*<br>▸ *Variable identification text with prefix and suffix*<br>The field must not be empty during validation. |
| **Identification prefix** | Entry of a prefix for the variable reference.<br>Only available if one of the reference creation variants with a prefix was selected.<br>The field must not be empty during validation if it is active. |
| **Identification suffix** | Entry of a suffix for the variable reference.<br>Only available if one of the reference creation variants with a suffix was selected.<br>The field must not be empty during validation if it is active. |
| **Rules for the creation of visual names** | Configuration of how the visual name of the variables is generated. This must be unique within the project and comply with the rules (on page 174) for names.<br>Select from drop-down list:<br>▸ *Variable identification text*<br>▸ *Variable identification text with prefix*<br>▸ *Variable identification text with suffix*<br>▸ *Variable identification text with prefix and suffix*<br>The field must not be empty during validation. |
| **Visual name prefix** | Entry of a prefix for the visual names.<br>Only available if one of the visual name creation variants with a suffix was selected.<br>The field must not be empty during validation if it is active. |
| **Visual name suffix** | Entry of a prefix for the visual names.<br>Only available if a creation variant for the visual name with suffix has been selected. |

| Option | Description |
|---|---|
| | The field must not be empty during validation if it is active. |
| **Data type setting rule** | Configuration of the rule to set the data type. Select from drop-down list:<br>▸ *Always set data type to numeric*<br>▸ *Always set data type to text*<br>▸ *Recognize data type based on column data type*<br>The field must not be empty during validation if it is active.<br>**Recommendation:** In the event of doubt, select *Recognize data type based on column data type* for this option. You thus ensure that there is no conversion error when creating or executing the UDF. |

### NAVIGATION

| Button | Description |
|---|---|
| **Previous** | Switches to the previous tab.<br>Inactive in the first tab. |
| **Next** | Switches to the next tab.<br>Inactive in the last tab. |
| **Create variables** | Starts variable creation.<br>Only active in the last tab and only if no validation error has been established. If validation errors are found, these are displayed and the button remains inactive.<br>Once the variable has been created, the button changes to **OK**. The creation of the archive can thus be started. |
| **Cancel** | Discards all inputs and closes the dialog. |

## 9.3.2.4 Summary and Execution

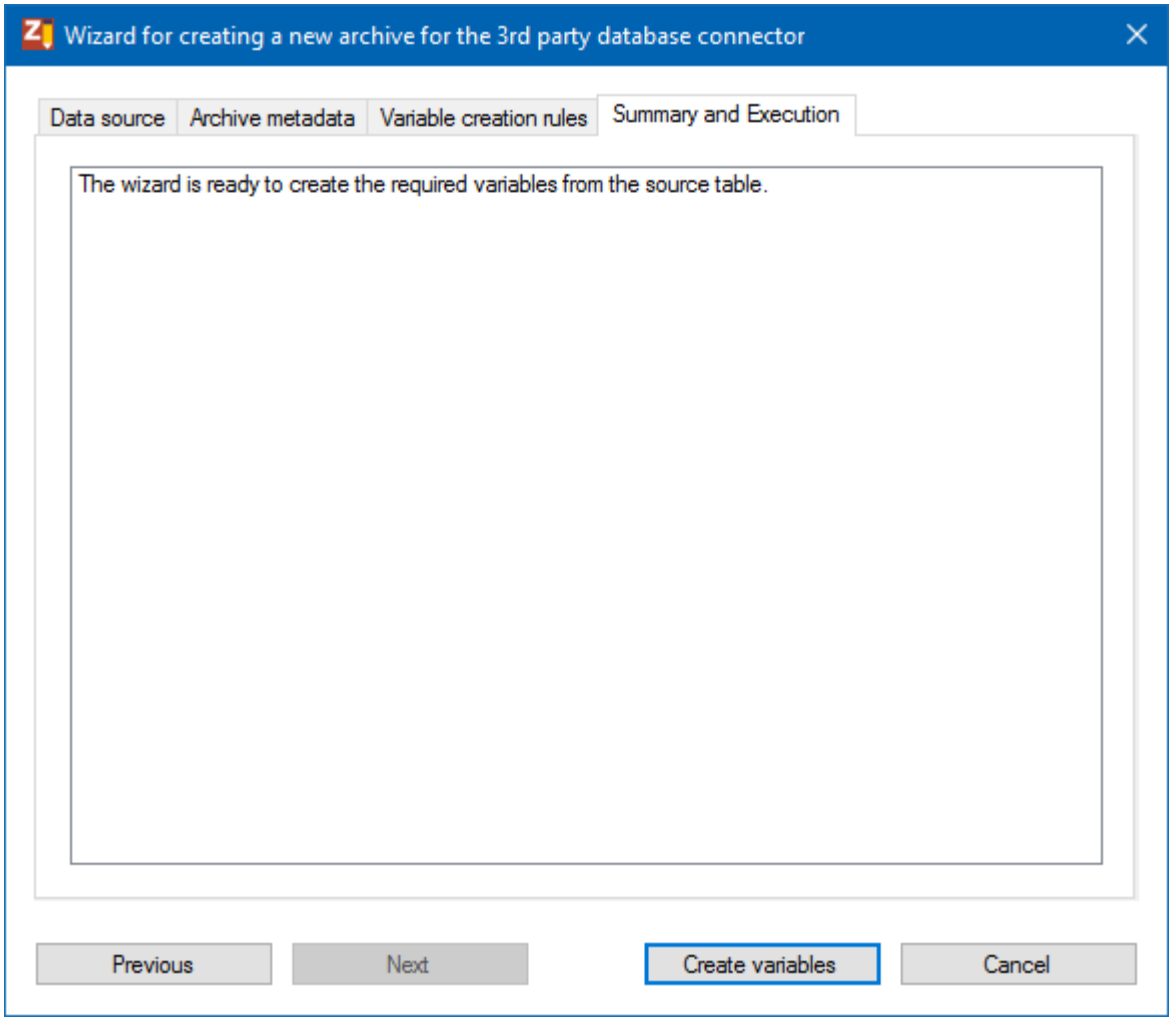
Display of the configuration and creation of an archive. When switching to this tab, the inputs in the other tabs are validated.

If the configuration is free of errors, then:

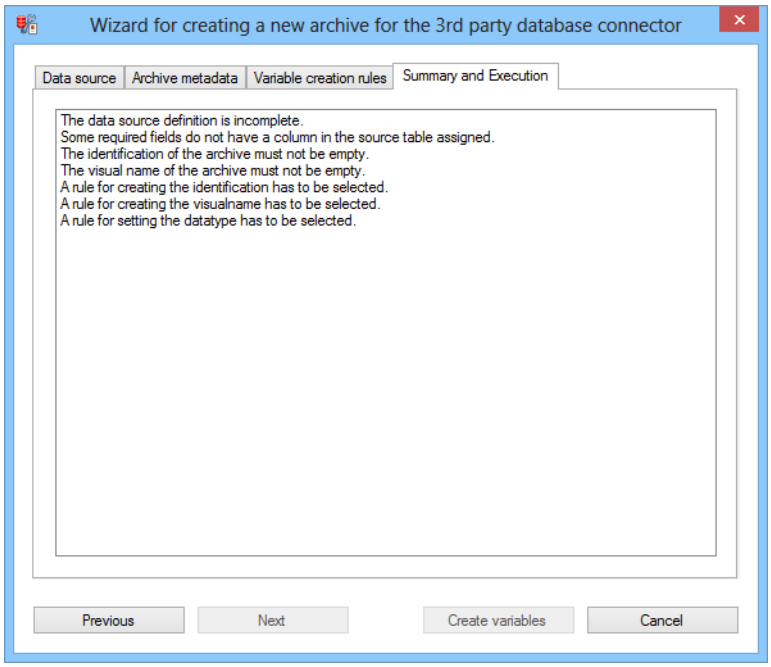
- The **Create variables** button is active
- Variables can be generated and an archive can be created

If errors are found, then:

- The **Create variables** button is inactive
- Configuration errors are displayed in the window



## CONFIGURATION ERROR FOUND

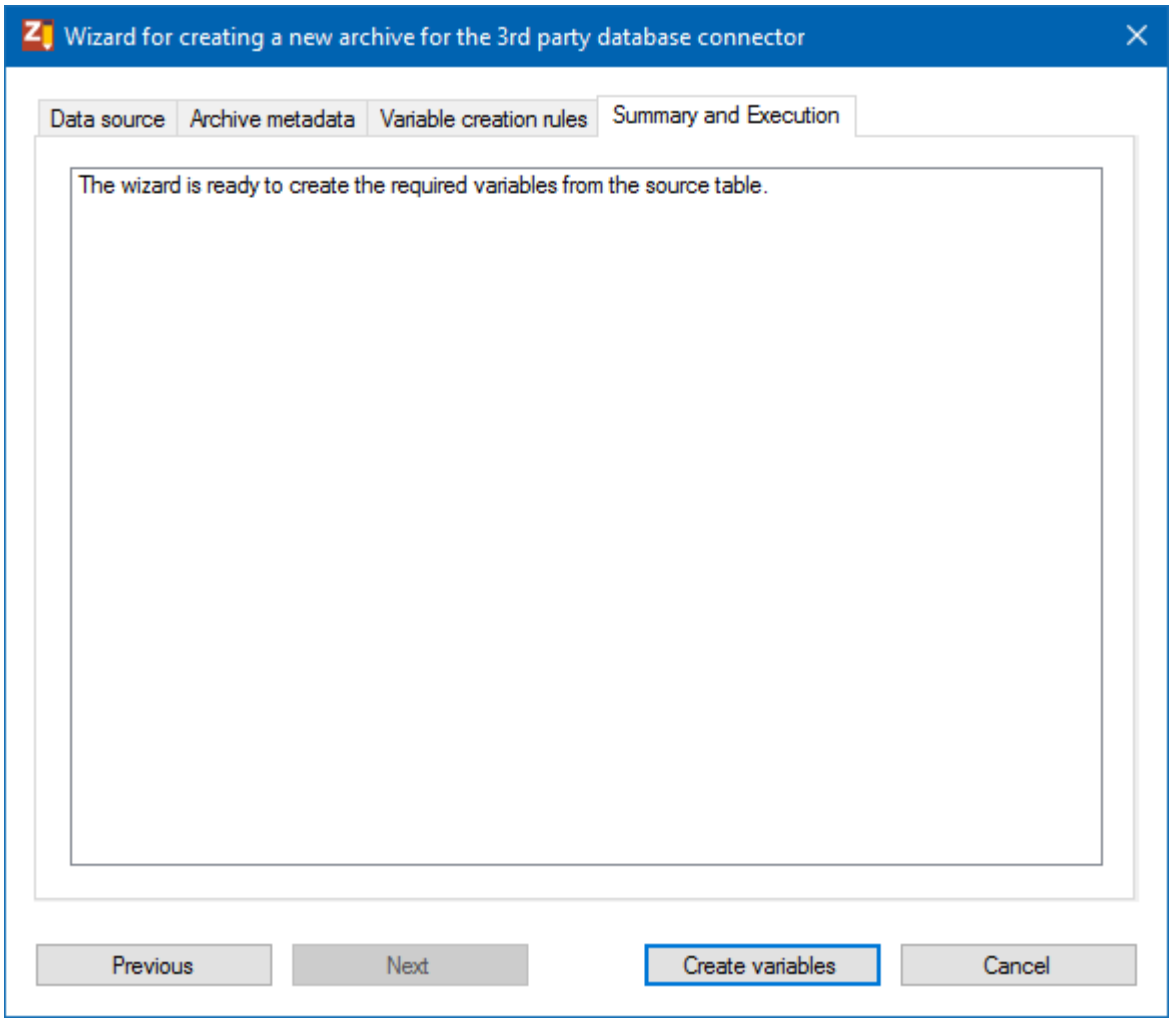



| Option | Description |
|---|---|
| **Display of the configuration** | Shows the result of the validation. Errors that have been found are listed. |
| **Previous** | Switches to the previous tab. |
| **Next** | Inactive. |
| **Create variables** | Inactive as long as there are configuration errors. |
| **Cancel** | Discards all inputs and closes the dialog. |

## CREATE VARIABLES AND ARCHIVE

If configuration has been carried out without errors, then the variables and then the archive can be created.

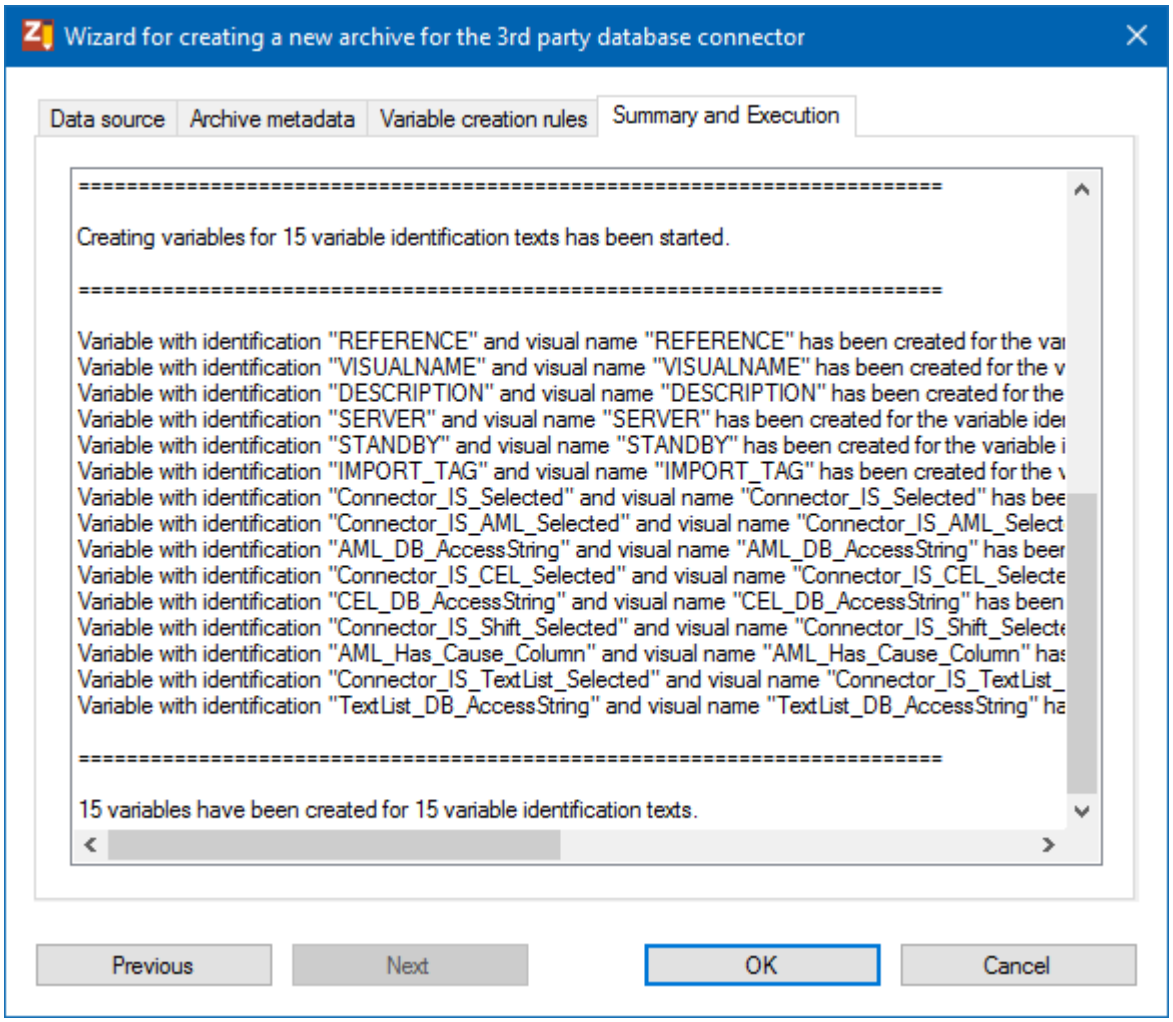
## CREATE VARIABLES




| Option | Description |
|---|---|
| **Display of the configuration** | Shows the result of the validation. |
| **Previous** | Switches to the previous tab. |
| **Next** | Inactive. |
| **Create variables** | Starts variable creation.<br>Only active if no validation errors have been established.<br>Once the variable has been created, the button changes to **OK**. |
| **Cancel** | Discards all inputs and closes the dialog. |

### CREATE ARCHIVE

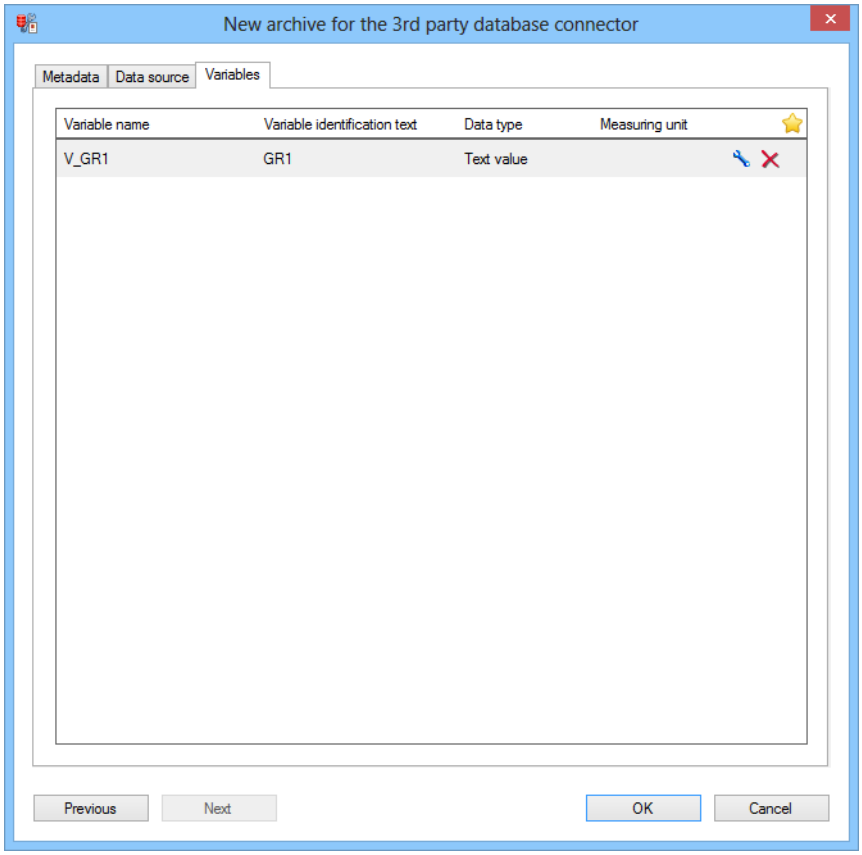
The archive can be created once the variables have been created.




| Option | Description |
|---|---|
| **Display of variable creation** | Lists all created variables. |
| **Previous** | Switches to the previous tab. |
| **Next** | Inactive. |
| **OK** | Creates the configured archive and closes the dialog. |
| **Cancel** | Discards all inputs and closes the dialog. |

### 9.3.3 Create or edit archive manually

With this dialog, metadata, data sources and variables are configured manually




This dialog is offered when:

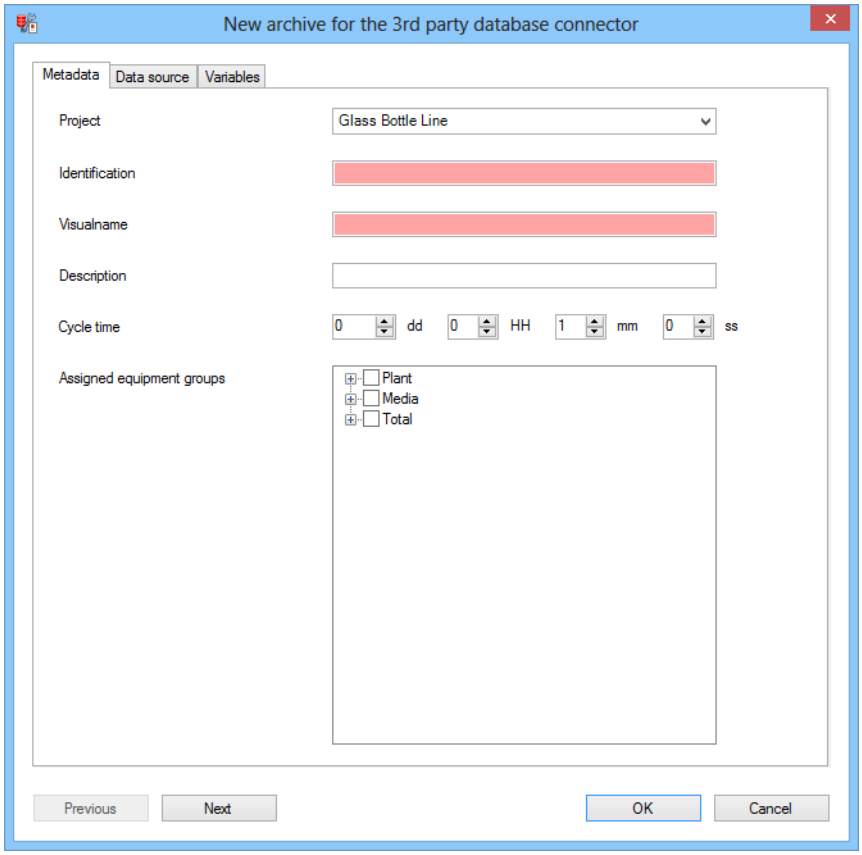
- Creating a new archive
- Editing an existing archive
- Amending an archive that has been created with the wizard

To create or edit an archive manually:

1. In the **Archives for the 3rd party database connector**, click on the symbol for **New archive**.
2. Configure the tabs:
   - **Metadata** (on page 166)
   - Data Source (on page 168)
   - Variables (on page 171)
3. Close the dialog.
4. The archive is displayed in the list and can be opened using the **Edit** symbol for further amendments at any time.

### 9.3.3.1 Metadata

Configuration of the metadata:




| Option | Description |
|---|---|
| **Project** | Project that is assigned to the archive. Select from drop-down list.<br>Only available if a new archive is created.<br>If the selection is changed, all variables that have already been created in the archive are deleted. |
| **Identification** | Archive reference. This must be unique for all archives within the project.<br>Only available if a new archive is created.<br>The field must not be empty during validation. |
| **Visual name** | Visual name for the archive. This must be unique for all archives within the project.<br>The field must not be empty during validation. |

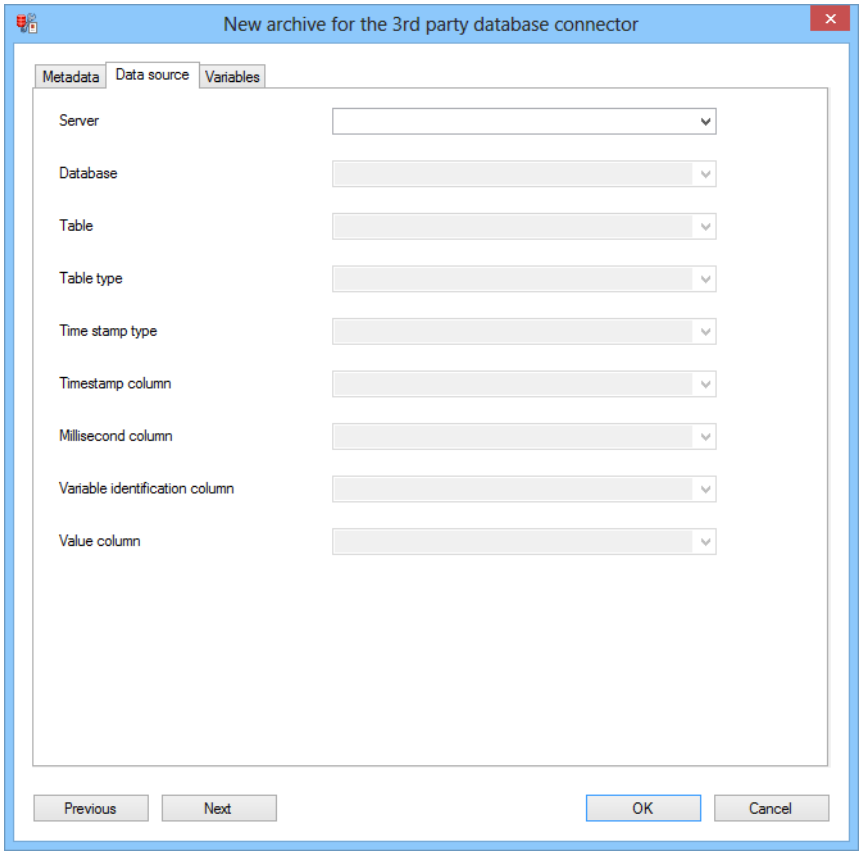
| Option | Description |
|---|---|
| **Description** | Descriptive text for the archive. |
| **Cycle time** | Configuration of the cycle time of the archive. |
| **Assigned equipment group** | Display of all available equipment models as a tree with checkboxes. Selection by activating the checkboxes in front of the desired equipment groups. |

## NAVIGATION

| Button | Description |
|---|---|
| **Previous** | Switches to the previous tab.<br>Inactive in the first tab. |
| **Next** | Switches to the next tab.<br>Inactive in the last tab. |
| **OK** | Closes the dialog and creates the archive.<br>If validation errors are established, the process is canceled and a message with the errors that have been established is shown. |
| **Cancel** | Discards all inputs and closes the dialog. |

### 9.3.3.2 Data Source

Configuration of the data source:




| Option | Description |
|---|---|
| **Server** | Selection of the database server from a drop-down list. The currently-connected server instance is identified by the suffixed note **(currently connected)**.<br><br>If the selection is changed during the configuration of the tab, the settings of this tab that depend on this are reset. And all created variables are deleted.<br><br>The field must not be empty during validation. |
| **Database** | Selection of the database on the selected **server** from a drop-down list. All databases of the selected server are available.<br><br>Only available if a **Server** has been selected.<br><br>If the selection is changed during the configuration of the tab, the settings of this tab that depend on this are reset. |

| Option | Description |
|---|---|
| | And all created variables are deleted.<br><br>The field must not be empty during validation. |
| **Table** | Selection of the source table from a drop-down list. All tables present in the selected database are available.<br><br>Only available if a **Database** was selected.<br><br>If the selection is changed during the configuration of the tab, the settings of this tab that depend on this are reset. And all created variables are deleted.<br><br>The field must not be empty during validation. |
| **Table type** | Selection of the table type from a drop-down list. Available are:<br><br>▸ *Variable identification column and value column*: flat list<br>▸ *One value column for each variable*: pivoted<br><br>Only available if a **table** was selected.<br><br>If the selection is changed during the configuration of the tab, the settings of this tab that depend on this are reset. And all created variables are deleted.<br><br>The field must not be empty during validation. |
| **Time stamp type** | Selection of the time stamp from the drop-down list. Available are:<br><br>▸ UTC timestamp object<br>▸ Timestamp object in server local time<br>▸ Unixtime<br>▸ Unixtime and milliseconds in two columns<br>▸ Unixtime and milliseconds in one column<br><br>Only available if a **table** was selected.<br><br>If the selection is changed during the configuration of the tab, the settings of this tab that depend on this are reset.<br><br>The field must not be empty during validation. |
| **Timestamp column** | Selection of the time stamp column from a drop-down list. |

| Option | Description |
|---|---|
| | All columns of the selected table whose data type is permitted for the current time stamp setting are available.<br><br>Only available if a **table** was selected.<br><br>The field must not be empty during validation. |
| **Millisecond column** | Selection of the millisecond column from a drop-down list. All columns of the selected table whose data type is permitted for a millisecond column are available.<br><br>Only available if a **table** has been selected and *Unix time with milliseconds* has been selected as a **time stamp type**.<br><br>The field must not be empty during validation if it is active. |
| **Variable identification column** | Selection of Variable identification column from drop-down list. All columns of the selected table whose data type is permitted for a variable identification column are available.<br><br>Only available if a **table** has been selected and *Variable identification column and value column* has been selected as a **table type**.<br><br>The field must not be empty during validation if it is active. |
| **Value column** | Selection of value column from drop-down list. All columns of the selected table whose data type is permitted for a value column are available.<br><br>Only available if a **table** has been selected and *Variable identification column and value column* has been selected as a **table type**.<br><br>The field must not be empty during validation if it is active. |

## NAVIGATION

| Button | Description |
|---|---|
| **Previous** | Switches to the previous tab.<br>Inactive in the first tab. |
| **Next** | Switches to the next tab.<br>Inactive in the last tab. |
| **OK** | Closes the dialog and creates the archive. |

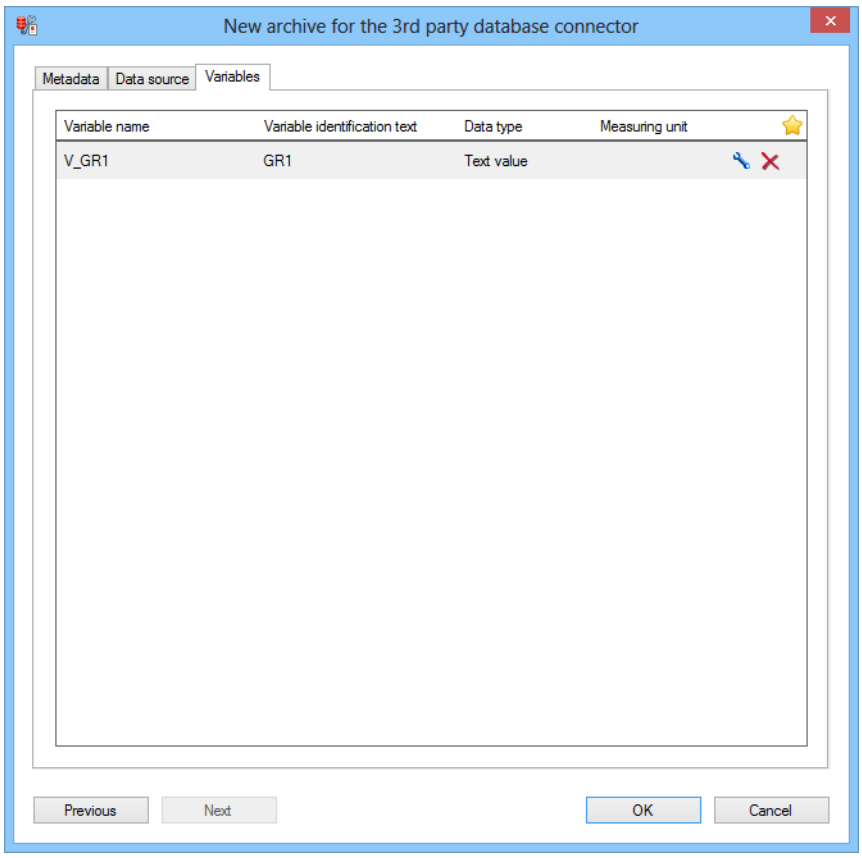
| Button | Description |
|---|---|
| | If validation errors are established, the process is canceled and a message with the errors that have been established is shown. |
| **Cancel** | Discards all inputs and closes the dialog. |

### 9.3.3.3 Variables

Configuration of the variables.

The following symbols are used in the dialog:

- : **New**
- : **Edit**
- : **Delete**




| Option | Description |
|---|---|
| **List of variables** | Display of the configured variables with the following |

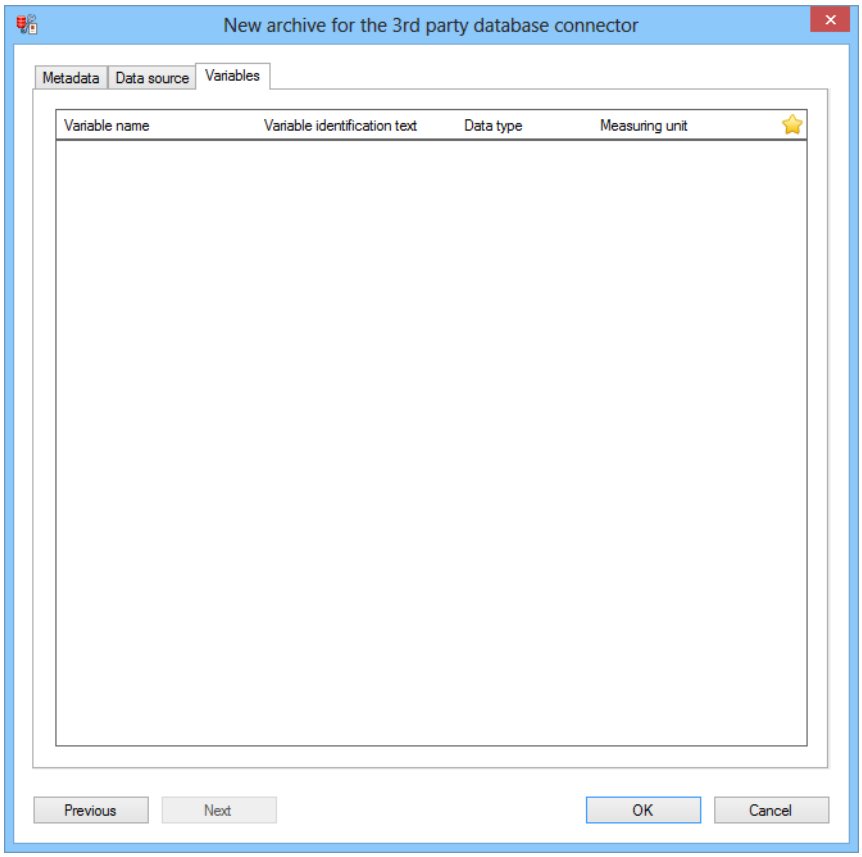
| Option | Description |
|---|---|
| | detailed information:<br>- **Variable name**<br>- **Variable identification text**<br>- **Data Type**<br>- **Measuring unit**<br>The variables are displayed in the order in which they were created: |
| **Buttons to edit the list and the variables** | The following symbols are available for editing:<br>**Bar:**<br>- **New**: Opens the dialog (on page 165) to create a variable. Only active if variables could have been created due to the configuration. To do this: - A project must have been selected - The data source definition must be complete - With the *pivoted* table type, at least one variable identification text must be available<br>**Variables:**<br>- **Edit**: Opens the dialog to edit a variable. This corresponds to the dialog to create a variable. However no new variables can be created.<br>- **Delete:** Deletes the variable from the list without confirmation. |

## NAVIGATION

| Button | Description |
|---|---|
| **Previous** | Switches to the previous tab.<br>Inactive in the first tab. |
| **Next** | Switches to the next tab.<br>Inactive in the last tab. |
| **OK** | Closes the dialog and creates the archive.<br>If validation errors are established, the process is canceled and a message with the errors that have been established is |

| Button | Description |
|---|---|
| | shown. |
| **Cancel** | Discards all inputs and closes the dialog. |

## CREATE VARIABLES




To create a new variable:

1. Click on the **New** button (star).
2. The dialog to create/edit variables is opened.
3. Configure the tabs for:
   - Metadata (on page 174)
   - Assigned equipment groups (on page 177)
   - Assigned meanings (on page 178)
   - Status texts (on page 179)
4. Close the dialog by clicking on **OK**.
5. The variable is displayed in the list and can be edited or deleted at any time by means of the buttons.

#### 9.3.3.4 Rules for issuing names

The following are not permitted for the **variable name** and **visual name**:

- Comma
- Vertical spacing
- Paragraph spacing
- Tabulators
- Space

These properties are checked on transfer and amended to the rules.
That means:

1. Commas, vertical spacing, paragraph spacing and tabulators are removed.
2. Spaces at the start and end are removed.
3. Several consecutive spaces in the text are combined into one space.
4. Spaces in the text are replaced with underscores.

### 9.3.4 Edit Variable

Also integrate “naming rules"

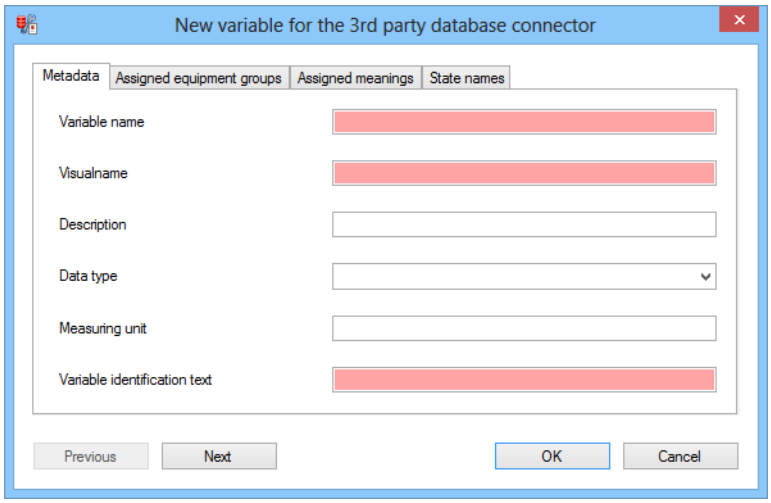
#### 9.3.4.1 Metadata

The metadata of the variables are configured in this tab. Depending on the setting for **table type** in the configuration of the **data source** (on page 168) in the archive configuration, this tab is available in two versions:

*Flat list* **table type**: **Variable identification text** is entered into the field

*Pivoted* **table type**: **Variable identification text** is selected from the drop-down list

## "FLAT LIST" TABLE TYPE



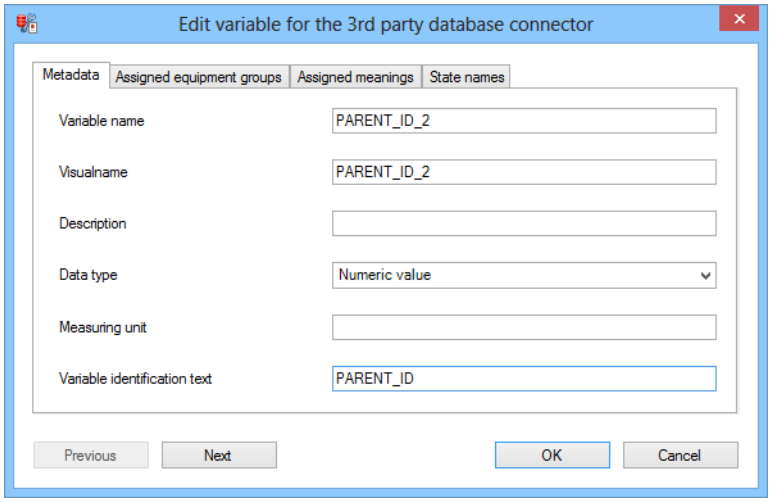

| Option | Description |
|---|---|
| **Variable name** | Name of the variable. This must be unique within the project and comply with the rules (on page 174) for names.<br>The field must not be empty during validation. |
| **Visual name** | Visual name of the variables stated. This must be unique within the project and comply with the rules (on page 174) for names.<br>The field must not be empty during validation. |
| **Description** | Descriptive text for the variables |
| **Data Type** | Data type of the variable. Select from drop-down list:<br>▸ *Numerical value*<br>▸ *Text*<br>**Note:** If the column data type does not allow conversion to a *numerical value*, then *Text* is preselected here and the drop-down list is deactivated.<br>The field must not be empty during validation. |
| **Measuring unit** | Input of the measuring unit of the variables. |
| **Variable identification text** | Entry of the variable identification text. The possibility depends on the **table type** in the configuration of the **data source** (on page 168) in the archive configuration:<br>▸ *Flat list*: Input field to enter the identification text of |

| Option | Description |
|---|---|
| | the variables.<br>▸ *Pivoted*: Drop-down list for the selection of the identification text. All column names of the table are available.<br>Exceptions: Column names that have already been used for the time stamp column, millisecond column or another variable in the archive.<br>The field must not be empty during validation. |

## NAVIGATION

| Button | Description |
|---|---|
| **Previous** | Switches to the previous tab.<br>Inactive in the first tab. |
| **Next** | Switches to the next tab.<br>Inactive in the last tab. |
| **OK** | Closes the dialog and creates the variable.<br>If validation errors are established, the process is canceled and a message with the errors that have been established is shown. |
| **Cancel** | Discards all inputs and closes the dialog. |

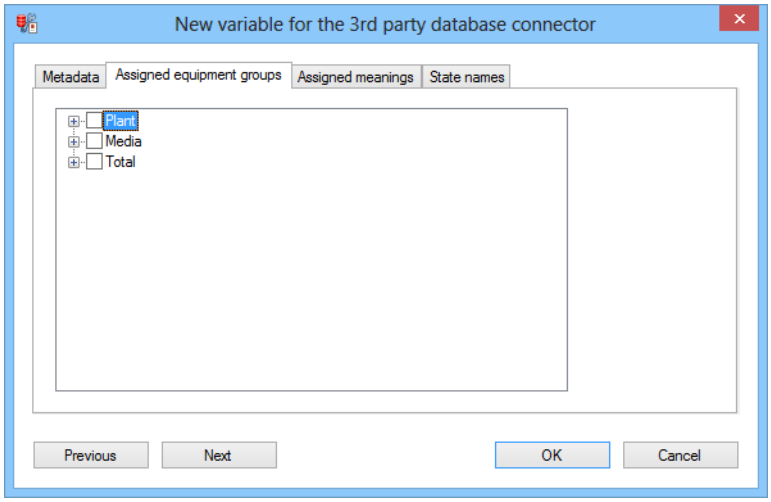
## "PIVOTED" TABLE TYPE:




Configuration as for the *flat list* table type.

### 9.3.4.2 Assigned equipment groups

Configuration of the equipment groups:



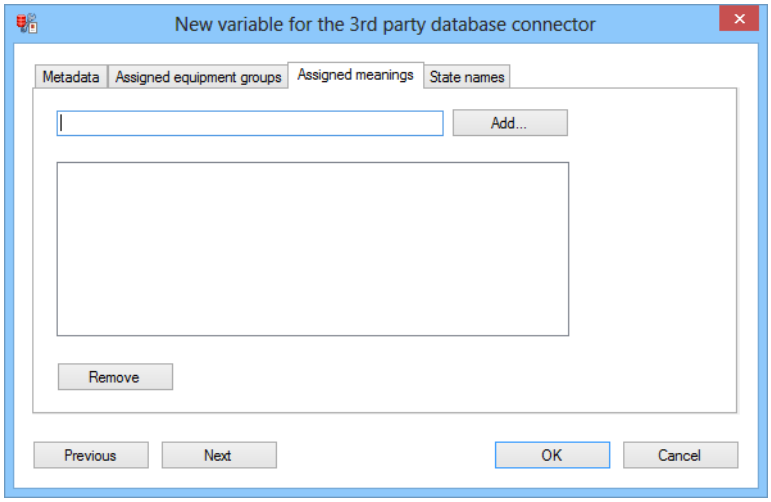

| Option | Description |
|---|---|
| **Assigned equipment group** | Display of all available equipment models as a tree with checkboxes. Selection by activating the checkboxes in front of the desired equipment groups. |

## NAVIGATION

| Button | Description |
|---|---|
| **Previous** | Switches to the previous tab.<br>Inactive in the first tab. |
| **Next** | Switches to the next tab.<br>Inactive in the last tab. |
| **OK** | Closes the dialog and creates the variable.<br><br>If validation errors are established, the process is canceled and a message with the errors that have been established is shown. |
| **Cancel** | Discards all inputs and closes the dialog. |

### 9.3.4.3 Assigned meanings

Configuration of the meanings:



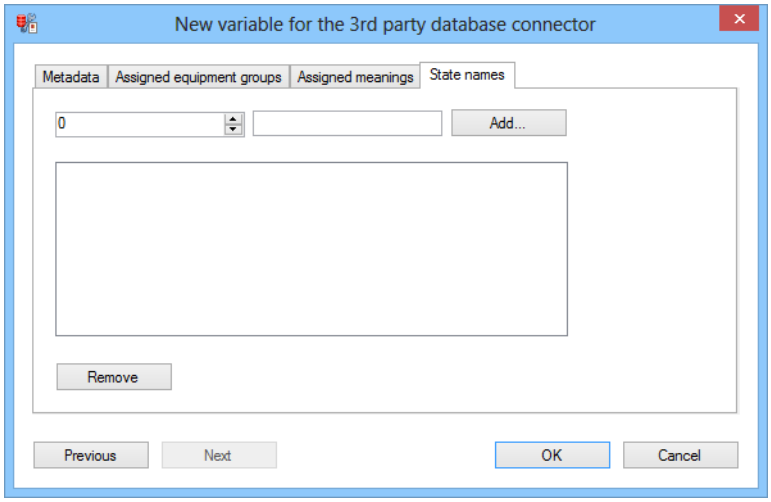

| Option | Description |
|---|---|
| **Assigned meaning** | Entry of the meaning into the field |
| **Add** | A click adds the entry in the **Assigned meaning** field to the **List of assigned meanings**. |
| **List of assigned meanings** | Displays all currently-configured meanings.<br>Multiple selection is possible. |
| **Remove** | Clicking removes all selected meanings from the **List of assigned meanings**. |

## NAVIGATION

| Button | Description |
|---|---|
| **Previous** | Switches to the previous tab.<br>Inactive in the first tab. |
| **Next** | Switches to the next tab.<br>Inactive in the last tab. |
| **OK** | Closes the dialog and creates the variable.<br>If validation errors are established, the process is canceled and a message with the errors that have been established is shown. |
| **Cancel** | Discards all inputs and closes the dialog. |

### 9.3.4.4 Status texts

Configuration of the status text:




| Option | Description |
|---|---|
| **Numeric entry** | Entry of the value for the status. |
| **Text field** | Entry of status text. |
| **Add** | Clicking adds the entry to the **List of status texts**. |
| **List of status texts** | Displays all currently-configured status texts.<br>Display format: **[Value]: [Text]**<br><br>Multiple selection is possible. |
| **Remove** | Clicking removes all selected status texts. |

## NAVIGATION

| Button | Description |
|---|---|
| **Previous** | Switches to the previous tab.<br>Inactive in the first tab. |
| **Next** | Switches to the next tab.<br>Inactive in the last tab. |
| **OK** | Closes the dialog and creates the variable.<br><br>If validation errors are established, the process is canceled |

| Button | Description |
|---|---|
| | and a message with the errors that have been established is shown. |
| **Cancel** | Discards all inputs and closes the dialog. |

## 9.4 New Analyzer database

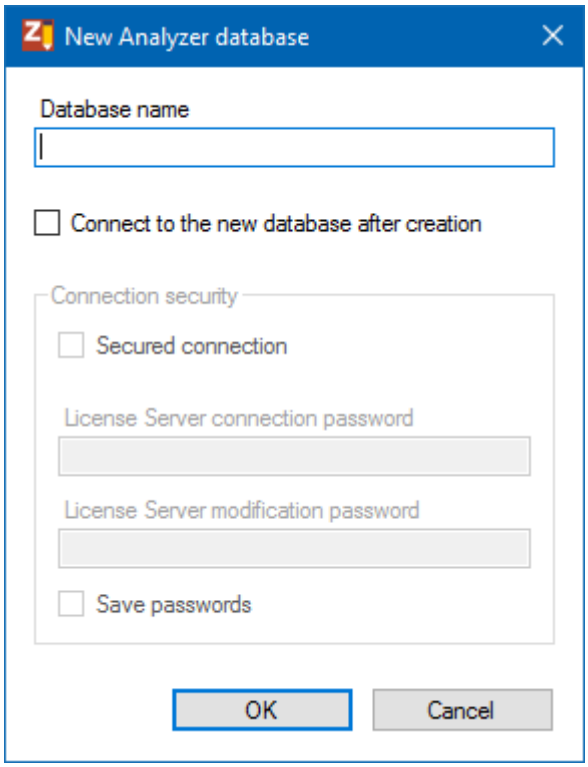
In order for a new Analyzer database to be created, there must be a connection to an Analyzer server with a valid license.

To create a new Analyzer database:

1. Click, in the **SQL Server** ribbon, on the **New** entry.

   The dialog to create a new database is opened.

2. Configure the settings.




| Option | Description |
|---|---|
| **Database name** | Name of the database to be created.<br><br>If this field remains empty or the name of a database that already exists on the SQL server is entered, an error message is |

| Option | Description |
|---|---|
| | given. |
| **Connect to the new database after creation** | ▸ *Active*: Once the database has been created successfully, the current connection is closed and a connection to the database that has just been created is established.<br>▸ *Inactive*: Once the database has been created successfully, the connection to the current database remains intact |
| **Connection security** | Settings for the connection security (on page 82). The entries must correspond to the configuration on the server. |
| **Secured connection:** | Activation or deactivation of the encrypted communication.<br>▸ *Active*: Communication is encrypted. For each connection, depending on the degree of encryption, passwords must be entered for the license service.<br>▸ *Inactive*: Communication is not encrypted.<br>**Note:** Secured communication cannot be configured for existing connection profiles. A new profile must be created. |
| **License Server connection password** | Entry of the password for the connection to the license server. Input is always hidden. The actual length is disguised. If the input field is active, it must be filled in order for a connection to be established. |
| **License Server modification password** | Entry of the change password on the license server.<br>Entry is always hidden. The actual length is disguised. If the input field is active, it must be filled in order for a connection to be established. |
| **Save password** | Stipulation of whether the connection parameters are saved in the connection profile.<br>Saving is carried out as a hardware-dependent and user-dependent hash of the password. |
| **OK** | Accepts all inputs, creates the database, establishes connections if necessary and closes the dialog. |
| **Cancel** | Rejects all inputs and closes the dialog without creating a database. |

## 9.5 Convert databases

Databases that were created with zenon Analyzer from version 2.0 can be converted to the respective later version being used. If a database with a lower version number than that of the ZAMS being executed is opened, this is converted into the newer version. Databases with a version less than zenon Analyzer 2.0 are not converted by ZAMS. The database structure and the license are checked during the conversion.

From version 2.10, ZAMS detects the version of the metadata structure definition of a database and can check its structure. All databases created with versions from 2.10 feature versioning of the database structure.

The checking of the version of the database is started if:

- A connection to a database is established
- Manual conversion of the databases is started

### CONVERT DATABASE MANUALLY

To convert databases:

1. Open the **SQL Server** ribbon.
2. Select the **Convert** entry.
3. ZAMS checks the version and structure of all existing databases.
   The search and its results are documented in the output window.
4. If convertible databases are found, these are offered for conversion:
   a) The dialog to configure the database conversion with two tabs is opened.
   b) Select the databases that are to be converted and the backup path.

      **Note:** Note the information in the comments. There may be other actions necessary after conversion, such as creating a new SCADA SQL connector.

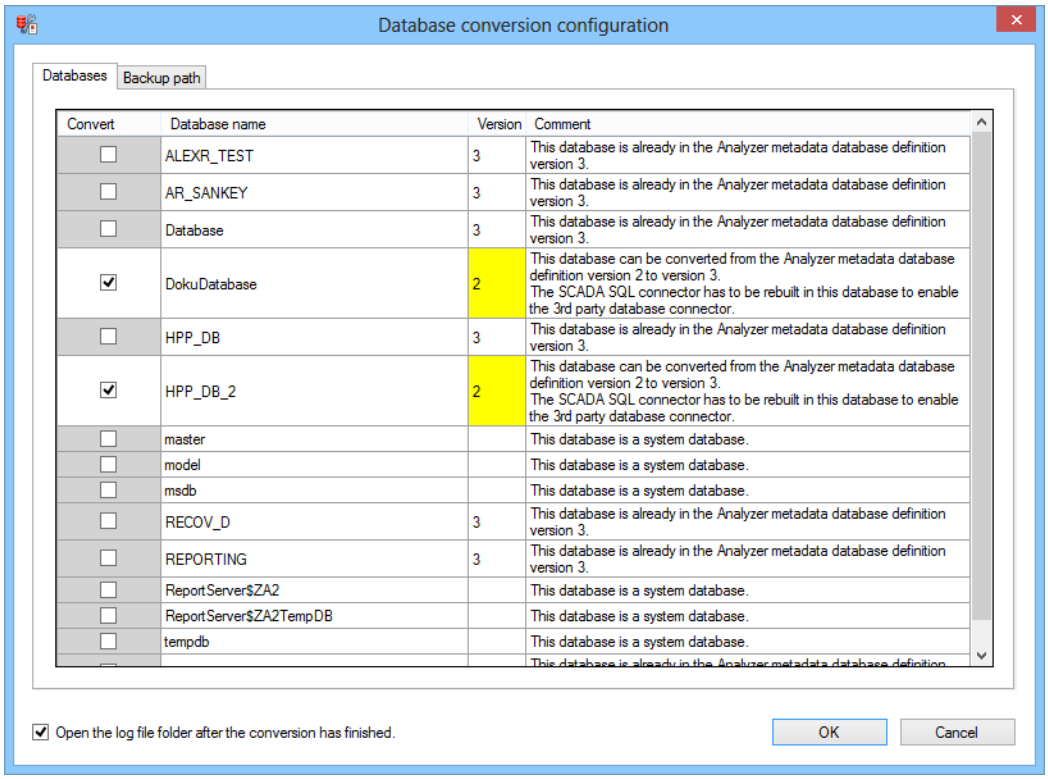
   c) Start the conversion by clicking **OK**
5. If no databases that can be converted are found, the search is ended and corresponding messages are displayed in the output window.

### DIALOG FOR CONFIGURATION OF THE DATABASE CONVERSION

This dialog allows the selection of the databases to be converted and configuration of the save path.

## DATABASES

Selection of the databases to be converted.



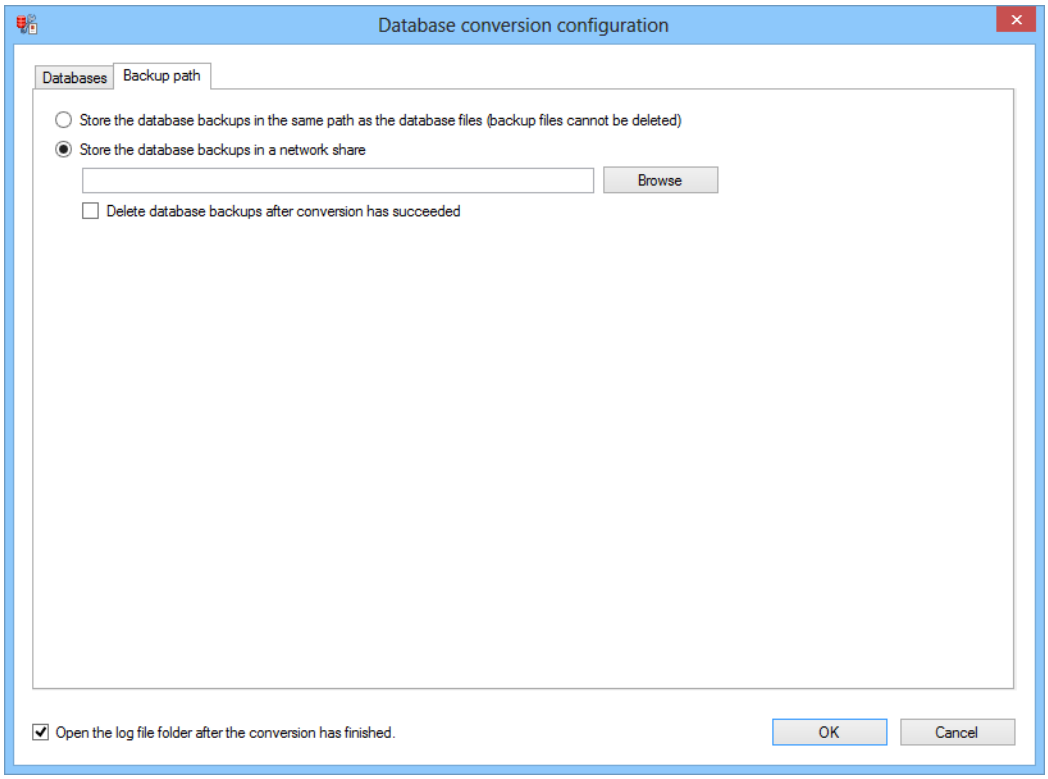

| Option | Description |
|---|---|
| **List of databases** | Lists all existing databases. If a line has a gray background, the database named therein cannot be converted. Details are in the **Comments** column.<br><br>The following are displayed:<br><br>▸ **Checkbox**: Selection of database. *Active*: Database for conversion selected. Only databases that can be technically converted are selected. Default for convertible databases: *active*<br><br>▸ **Database name**: Name of the database.<br><br>▸ Version: Database version.<br><br>▸ **Comment**: Reason why a database cannot be converted or from which to which version a database can be converted. Note the references to actions that must be carried out after conversion. |

| Option | Description |
|---|---|
| **Open the LOG file folder after the conversion has finished.** | *Active*: After conversion, the folder with the LOG files for conversion is opened. |
| **OK** | Accepts settings in all tabs and starts conversion. |
| **Cancel** | Discards settings in all tabs and cancels the conversion. |

The size and position of the dialog can be changed. These settings are saved as user-dependent.

### BACKUP PATH

Configuration of the path for backup files and selection of whether these are to be deleted after successful conversion.




| Option | Description |
|---|---|
| **Store the database backups in the same path as the database files** | *Active*: The database backup files are stored locally in the same folder as the database files in the Analyzer server.<br><br>Because this can be a different computer to the ZAMS computer, access to its file system cannot be guaranteed. The backup files stored there thus cannot automatically be deleted by ZAMS after |

| Option | Description |
|---|---|
| | successful conversion. |
| **Store database backups in a network share** | *Active*: The database backup files are<br>stored in a network share.<br>Input of the folder in the text field or selection from a dialog after clicking on the **Browse** button.<br>**Attention:** It must be ensured that the user in whose context the SQL server instance is running has access to this network share with the following rights:<br>▸ read<br>▸ write:<br>▸ overwrite |
| **Browse** | Opens the dialog for selecting a network share (on page 347). |
| **Delete database backups once they have been converted** | *Active*: The database backup files are deleted after successful conversion of the database.<br>Prerequisite: The backup files are in a network share.<br>The option is executed for each database. If, for example, databases are converted and a conversion is unsuccessful, then:<br>▸ Four backup files are deleted<br>▸ If the backup file for the unsuccessful conversion is retained |
| **Open the LOG file folder after the conversion has finished.** | *Active*: After conversion, the folder with the LOG files for conversion is opened. |
| **OK** | Applies all changes in all tabs and closes the dialog. |
| **Cancel** | Discards all changes in all tabs and closes the dialog. |

### CONVERSION NOTES

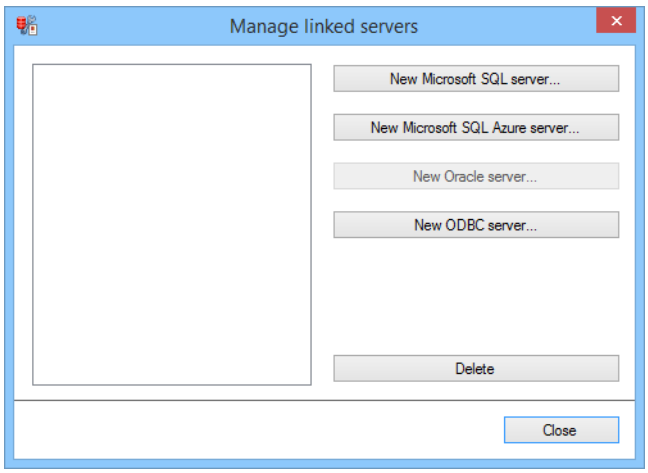
Note most of all when converting databases:

- If a database that is a version less than 2 is converted, then the following applies for the conversion to:
  - Version 2 or higher: The SCADA SQL connector has to be created again in order to have emulated archives available in reports.
  - Version 3: The SCADA SQL connector has to be created again in order to have archives available for import from third-party databases.
- If a database that is a version less than 3 is converted, then the following applies for the conversion to:
  - Version 3 or higher: The SCADA SQL connector has to be created again in order to have archives available for import from third-party databases.
- If a database that is a version less than 5 is converted, then the following applies for the conversion to:
  - Version 5 or higher: Alarm and event SQL connectors are reset to factory default. These must be reconstructed after conversion.
- If a database that is a version less than 8 is converted, then the following applies for the conversion to:
  - Version 8 or higher: Access structures for SQL connector and third-party database connector have been changed. They are generally compatible.
    Recommendation: You must nevertheless build new versions of these.

## 9.6 Manage linked servers

A linked server enables a database connection to ODBC-compatible databases in SQL Server. After configuration in ZAMS, it is thus possible to access data outside of the SQL Server instance (ZAx) that is used for the Analyzer server. For example, on Microsoft SQL Server, Microsoft SQL Azure, but also on third-party databases such as Oracle or MySQL. A linked server can be used in the configurations for the SCADA SQL connector and for the third-party database connector. This function is available if there is a connection to an Analyzer server with a valid license.

When this function is started, a list of the linked servers is obtained from the SQL Server instance. This list comes from the database to which ZAMS is connected.




| Option | Description |
|---|---|
| **List of linked servers** | Contains all linked servers.<br>The expression in brackets contains the provider for the connection.<br>All linked servers are always shown, even if they are a type that is not supported. |
| **New Microsoft SQL server** | Gets all SQL Server instances available in the network and opens the dialog (on page 190) to configure a linked SQL server. |
| **New Microsoft SQL Azure server** | Opens the dialog (on page 191) to configure a linked Microsoft SQL Azure server.<br>**Note:** Each database on an SQL Azure instance must be added as its own linked server for technical reasons.<br>You can also find general information on **MS Azure** in the MS Azure manual. |
| **New Oracle server** | Opens the dialog (on page 193) to configure a linked Oracle server.<br>**Note:** This button is only active if (**OraOLEDB.Oracle**) is found on the SQL server instance of the Oracle OLEDB provider. |
| **New ODBC server** | Opens the dialog (on page 194) to configure a linked ODBC server. |

| Option | Description |
|---|---|
| **Delete** | Deletes the server highlighted in the list. |
| **Close** | Closes the dialog |

Further providers of linked servers are available with SQL Server 2016. Providers from third-party manufacturers are also available; the Oracle OLE DB provider is an example of this. If a provider that is different to the ones pre-configured here is to be used, the linked server can be set up manually using SQL Server Management Studio.

### 9.6.1 Configuration of the provider

A provider is a driver for SQL Server, which allows it access to other database systems. Similar to the drivers in an HMI/SCADA system such as zenon, the driver must be configured in order for communication to work. The linked servers of the following drivers can be addressed by the SQL connector:

- **SQLNCLI** for Linked SQL server
- **SQLNCLI11** SQL SQL Azure
- **OraOLEDB.Oracle** for Linked Oracle server
- **MSDASQL** for Linked ODBC server

You can find the providers in the SQL Server Management Studio in the **Object Explorer**; the path is: **[linked instance] -> Server Objects -> Linked Servers -> Providers**

Settings that are made in the properties of the provider are only applicable for the instance under which the provider is entered in the **Object Explorer**.

#### "SQLNCLI" FOR LINKED SQL SERVER

This provider can be left with the default settings.

Addressing the tables: **[linked server name].[database name].[scheme name].[table name]**

#### "SQLNCLI11" FOR LINKED SQL AZURE SERVER

This provider can be left with the default settings.

Addressing the tables: **AZURE -[linked server name]..[scheme name].[table name]**

**Note:** The **AZURE -** prefix is to distinguish identically-created **Linked Oracle** databases.

## "ORAOLEDB.ORACLE" FOR LINKED ORACLE SERVER

3rd party data archives for Oracle linked servers are queried using the **OPENQUERY** mechanism

### REQUIREMENTS

Installed and correctly-configured Oracle client with OLE DB provider. The **Oracle Database Client Software** must be installed.
In addition to the provider, there must also be an entry for the database server in the configuration of the Oracle client. The configuration of this depends on the version of the Oracle client used. You can find information on this in the documentation of the Oracle client used.

### CONFIGURATION

For configuration:

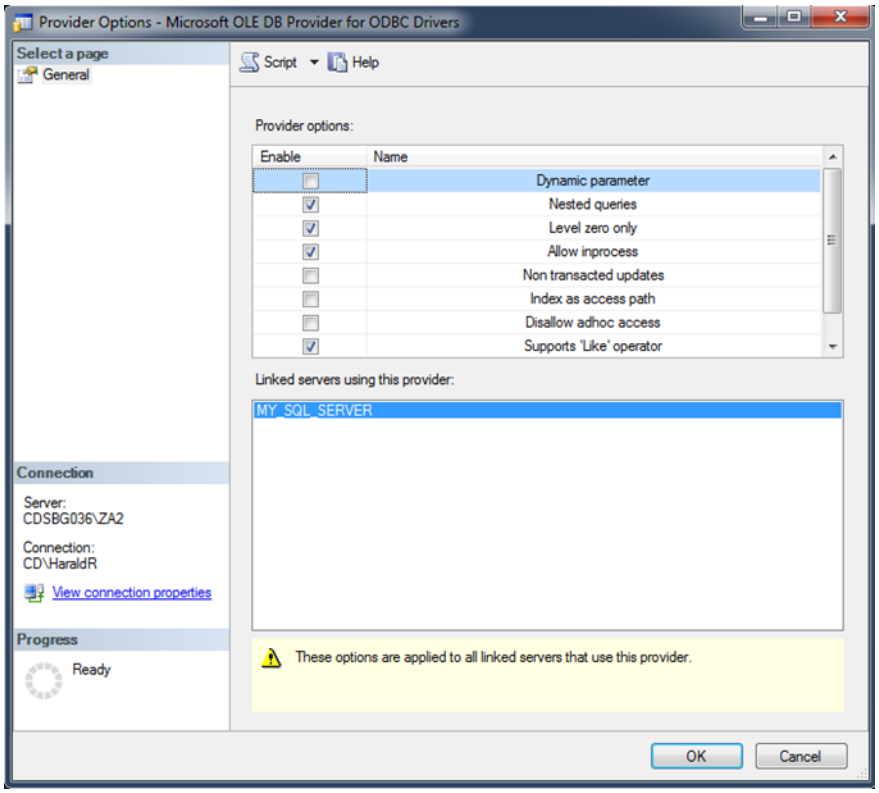
1. Start the SSMS and connect it to ZA3.
2. Go to **Server Objects --> Linked Servers --> Providers**.
3. Open the **OraOLEDB.Oracle** properties.
4. Activate the following options:
   - **Dynamic Parameter**
   - **Nested queries**
   - **Allow inprocess**
   - **Not transacted updates**
   - **Supports 'Like' operator**
5. Deactivate all other options.

Addressing the tables: **[linked server name]..[scheme name].[table name]**

**Note:** If an error occurs when analyzing a table, this is shown as a message in the output window. The table is skipped.

### "MSDASQL" FOR LINKED ODBC SERVER

The checkboxes in the properties of this provider must be as in the screenshot below:



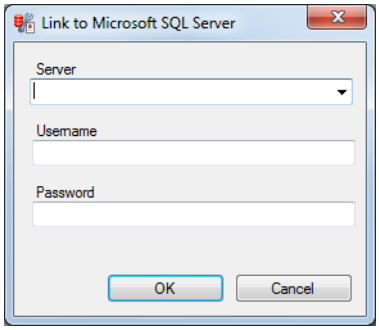

Addressing the tables: **[linked server name]...[table name]**

If one of these settings is changed, all linked servers that use this provider must be recreated in order for the changes to be accepted.

**Note:** The data source (DSN or ODBC connection string) must be configured so that only one database is used on the target database system. You can read how a database client for ODBC can be configured as a system DSN in the documentation of the database client used.

## 9.6.2 Linked SQL server

Configuration of a linked SQL server.



| Option | Description |
|---|---|
| **Server** | Entry for SQL server instance. Either a selection from a drop-down list or details of its own instance.<br>The entry is the name for the linked server at the same time, as described by the provider. |
| **User name** | User name. |
| **Password** | Password. Is not displayed in plain text. |
| **OK** | Applies settings and closes the dialog. |
| **Cancel** | Discards all changes and closes the dialog. |

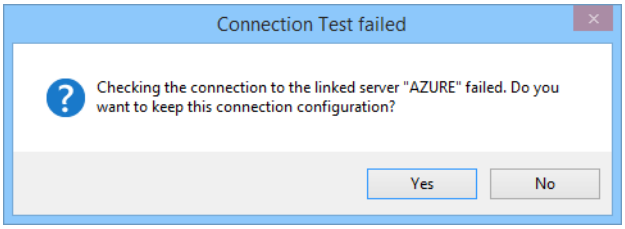
## 9.6.3 Linked Microsoft Azure server

Configuration of a linked Microsoft Azure server

1. In the dialog to administer the linked server (on page 186), click on the **New Microsoft Azure Server** button.

   The dialog for configuring a server is opened.
2. Assign a name for the server.
3. Enter an instance name.
   **Note:** You can find this on Microsoft Azure.
4. Enter the name of the database.
5. Enter the user name for access.
6. Enter the password for access.
7. Click on **OK**.

   The linked server is created and the dialog for creation is closed.
   The new linked server is then given a connection test.
   If the test is not successful, there is a query asking whether the new settings are to be retained:

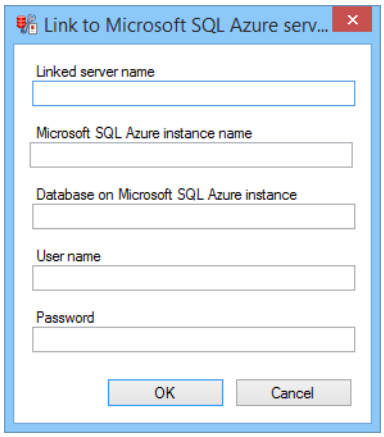



- **Yes**: Settings are retained and are displayed in the list.

- **No**: Settings are discarded and the server is removed from the list.

> **Information**
>
> Each database on an SQL Azure instance must be added as its own linked server for technical reasons.

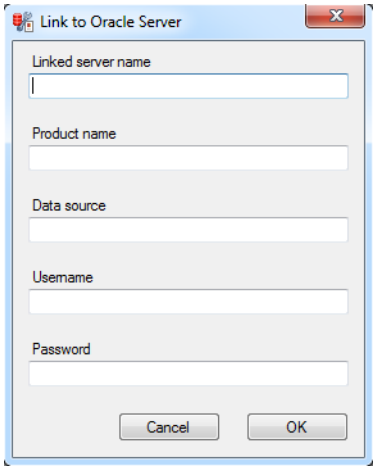
## DIALOG CONFIGURATION




| Option | Description |
|---|---|
| **Linked Server name** | Name of the linked server. |
| **Microsoft SQL Azure instance name** | Name of the SQL Azure instance.<br>Can be read from Microsoft Azure.<br><br>Syntax: **[any desired character sequence].[database].windows.net** |
| **Database on Microsoft SQL Azure instance** | Entry of the database name.<br>Can be read from Microsoft Azure. |
| **User name** | Entry of the user name. |
| **Password** | Password. Is not displayed in plain text. |
| **OK** | Applies settings and closes the dialog.<br><br>A connection test is carried out afterwards. If the connection cannot be established, the option to reject the configuration is offered. |
| **Cancel** | Discards all changes and closes the dialog. |

## 9.6.4 Linked Oracle server

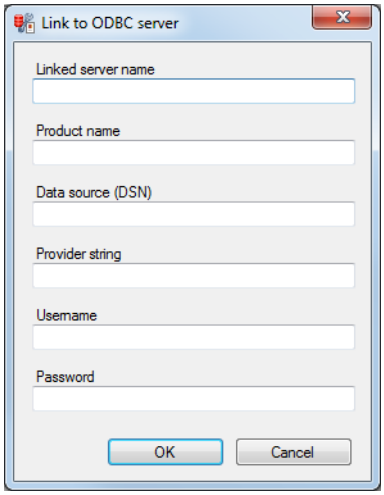
Configuration of a linked Oracle server




| Option | Description |
|---|---|
| **Linked server name** | Name of the new Linked Oracle server. The name must not have been issued to an existing linked server already. |
| **Product name** | Any desired product name. |
| **Data source** | Connection name for the **Oracle OLEDB Provider**.<br>You can find details on installation and setting up the parameters of the Oracle providers in the Oracle documentation. |
| **Username** | User name |
| **Password** | Password. Is not displayed in plain text. |
| **OK** | Applies settings and closes the dialog. |
| **Cancel** | Discards all changes and closes the dialog. |

## 9.6.5 Linked ODBC server.

Configuration of a linked ODBC server.




| Option | Description |
|---|---|
| **Name of connection server** | Name of the new linked ODBC server. The name must not have been issued to an existing linked server already. |
| **Product name** | Any desired product name. |
| **Data source (DSN)** | Name of the DSN entry to be used.<br>If nothing is entered here, the provider string must be specified in the **Provider string** field. |
| **Provider-String** | The provider string to be used is given here. If nothing is entered here, the DSN entry must be specified in the **Data source (DSN)** field. |
| User name | User name. |
| **Password** | Password. Is not displayed in plain text. |
| **OK** | Applies settings and closes the dialog.<br>One the two fields, **Data source (DSN)** or **Provider string** can be empty. |
| **Cancel** | Discards all changes and closes the dialog. |

## 9.7 Manage metadata indices

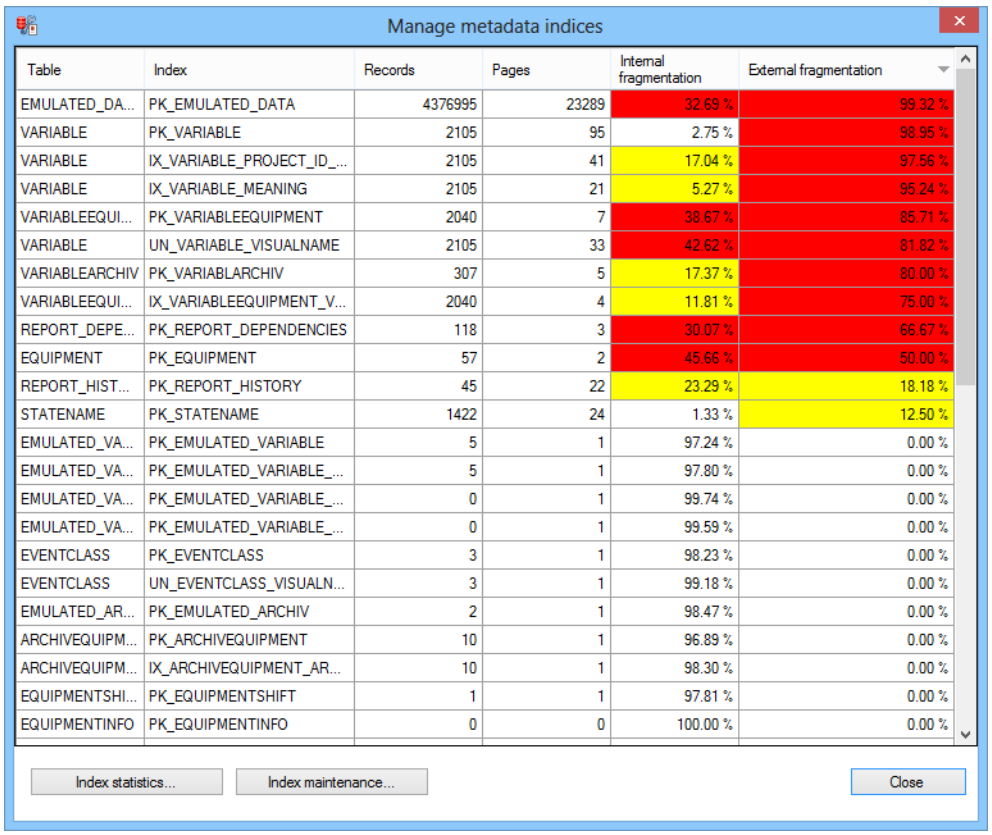
In order for metadata indices to be administered, there must be a connection to an Analyzer server with a valid license.

To administer the metadata indices:

1. Select the **Metadata indices** command in the **SQL server** ribbon.

   The dialog with the display of the fragmentation of the metadata indices is opened.

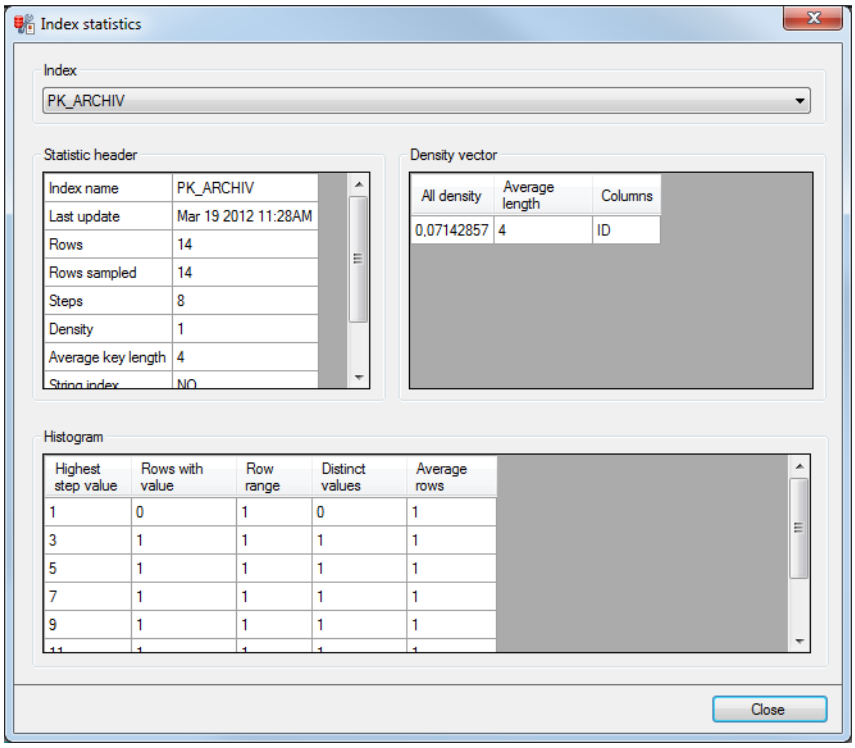
The size of the window can be adjusted by dragging with the mouse. The position and size are saved depending on the user and the ZAMS version.




| Option | Description |
|---|---|
| **Table** | Table name. |
| **Index** | Index name. |
| **Records** | Number of entires in the index. |
| **Pages** | Number of pages on which the index is saved. |
| **Internal fragmentation** | Value displays how much (in percent of pages on which the index is saved) is unused. A high degree of internal fragmentation increases the memory that the index occupies. |

| Option | Description |
|---|---|
| | This can reduce the index performance, because more pages have to be read. Critical values are accented in color:<br>▸ Yellow: Value greater than 5%<br>▸ red: Value greater than 30%<br>Indices without entries always have internal fragmentation of 100%. Indices that occupy 1 or 0 pages are excluded from highlighting. |
| **External fragmentation** | The value states how many of the pages of the index are not saved consecutively.<br>A page cannot be saved consecutively if its logical position between other index pages in the index is not equal to its physical position between other index pages on the memory medium.<br>A high degree of external fragmentation reduces the index performance, because it is often necessary to jump between save locations on the memory medium when reading the index.<br>Critical values are accented in color:<br>▸ Yellow: Value greater than 5%<br>▸ red: Value greater than 30%<br>Indices that occupy 1 or 0 pages always have an external fragmentation of 0%.<br>The table is in descending order according to this column as standard. |
| **Index statistics** | Opens the dialog for displaying the index statistics. |
| **Index administration** | Opens the dialog for index maintenance. |
| **Close** | Closes the dialog. |

## INDEX STATISTICS

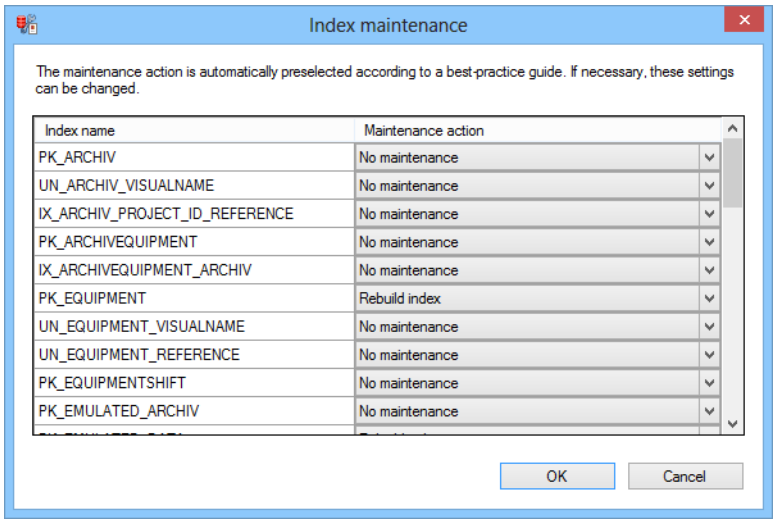



| Option | Description |
|---|---|
| **Index** | Selection of the index from the drop-down list.<br>The following tables are filled with data depending on this selection. |
| **Statistic header** | Header with metadata. |
| **Density vector** | Density vector to measure the correlations between columns. |
| **Histogram** | Histogram for distribution of the values. |
| **Close** | Closes the dialog. |

You can find more information on interpretation of the values at, for example:

- MSDN: http://msdn.microsoft.com/en-us/library/ms174384(v=sql.90).aspx (http://msdn.microsoft.com/en-us/library/ms174384(v=sql.90).aspx)
- SQL ServerCentral: http://www.sqlservercentral.com/articles/Stairway+Series/72446/ (http://www.sqlservercentral.com/articles/Stairway+Series/72446/) (registration required)

## INDEX ADMINISTRATION




| Option | Description |
|---|---|
| **Index name** | **Name of the index.** |
| Maintenance action | Possible maintenance actions. When switching, the appropriate maintenance action is pre-selected for each index. The dialog can usually be confirmed without changes by clicking on OK.<br><br>Select from drop-down list:<br><br>▸ *No maintenance*:<br>Do not carry out any action.<br>Always available.<br><br>▸ *Recompute index statistics*:<br>Updates the statistics.<br>Only available if the index occupies more than 0 pages.<br>The action hardly needs to be carried out, because the SQL server has good automated mechanisms for carrying this out.<br><br>▸ *Reorganize index*:<br>Reorganize index (includes *Recompute index statistics*.)<br>Only available if the index occupies more than 0 pages.<br><br>▸ *Rebuild index*:<br>Rebuilds the index. (includes *Recompute index statistics*.)<br>Only available if the index occupies more than 0 pages. |
| **OK** | Executes the selected action and ends the dialog. |
| Cancel | Exits the dialog without carrying out any actions |

If an action is not successful, a message window with the indices where maintenance was unsuccessful is displayed.

### 9.7.1 Best practice for maintenance action

The decision on what appropriate administrative action to take is orientated towards the Best Practices for index administration. It follows this scheme:

1. If the index occupies more than one page and the external fragmentation is *>= 5 %*: Reconstruct index;

   otherwise continue
2. If the index occupies more than one page and the internal fragmentation is *>= 30 %*: Reconstruct index;

   otherwise continue
3. If the index occupies more than one page and the internal fragmentation is *>= 5 %*: Reorganize index;

   otherwise continue
4. No administration

You can find further information on indexing in the **Indexing of database tables - Best Practice** chapter.

## 9.8 Configure archive emulation

In ZAMS, you can emulate archives that exist from figures from entries in the AML, CEL and archives in zenon.

To configure the archive emulation:

1. Select the **Emulated archives** entry in the **SQL Server** ribbon.
2. Click on the **New** button to create a new emulated archive,
   or **Edit** to change an existing emulated archive

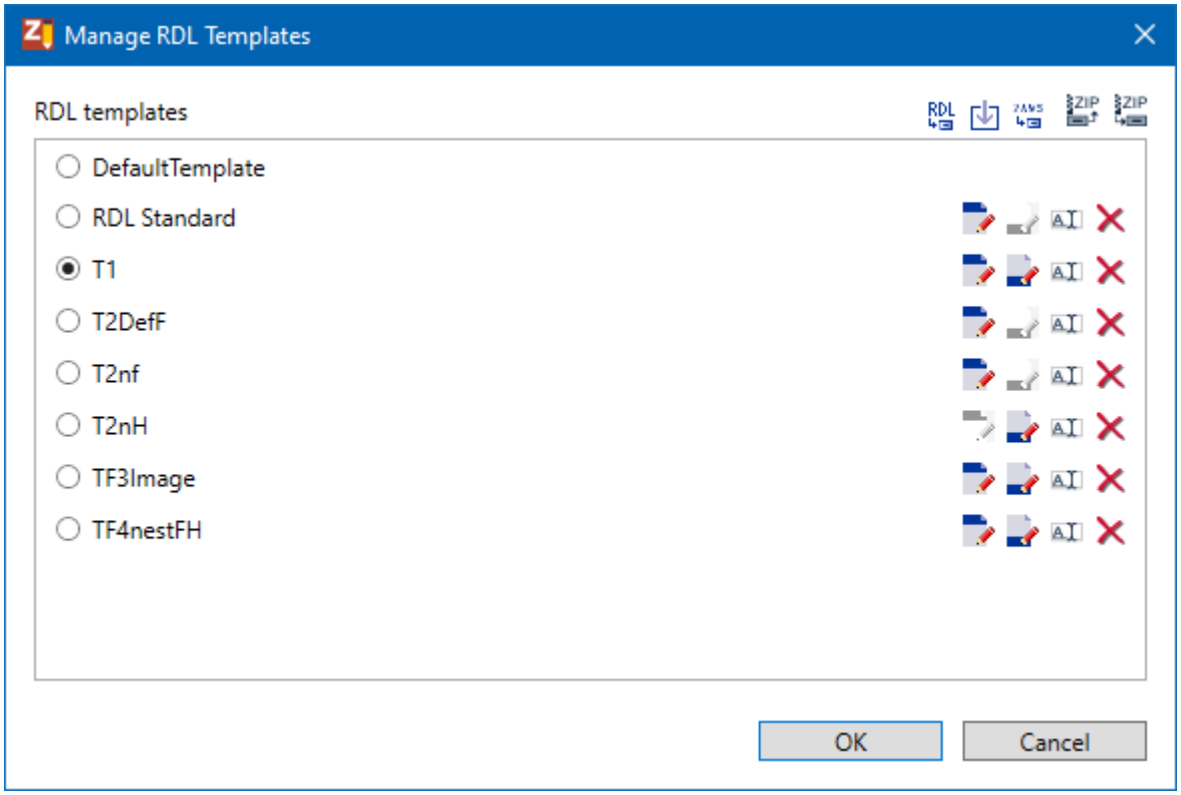
You can find details on archive emulation and the configuration of emulated archives in the archive emulation (on page 370) section.

# 10 RDL templates

RDL templates are used when preparing reports. They can contain a header and/or a footer. These contain:

- Information about the size and position
- Further elements such as text, images and graphics

RDL templates can be restored and edited from RDL files, reports and other versions.




When preparing a report, user-defined headers and footers are taken from the RDL template. The default footer is used if the RDL template does not contain a footer. The header and footer are amended to the report width.

- If, with a report, the width is less than the width of an existing header or footer, a warning is written in the output window. The dynamic layout leaves the header and footer unchanged in this case.
- The width of the header or footer is the minimum of:
  - Report width
  - Page width minus left and right edge
  - Interactive width

The width information of all RDL templates is noted in ZAMS. If the report is wider than the minimum needed by the template, the behavior can be configured for each element in the header and footer:

**The elements can:**

- Remain unchanged
- Grow in width accordingly

- Be moved to the right

**Note:** The default footer created by ZAMS is not taken into account in the process.

## 10.1 Manage and edit RDL templates

RDL templates can be restored, managed and edited (on page 201) in ZAMS.

> **Attention**
>
> All changes, such as import, rename or delete, are only carried out definitively if the **manage RDL templates** dialog is closed by clicking on **OK**. The change is not carried out if this dialog is closed with **Cancel**.

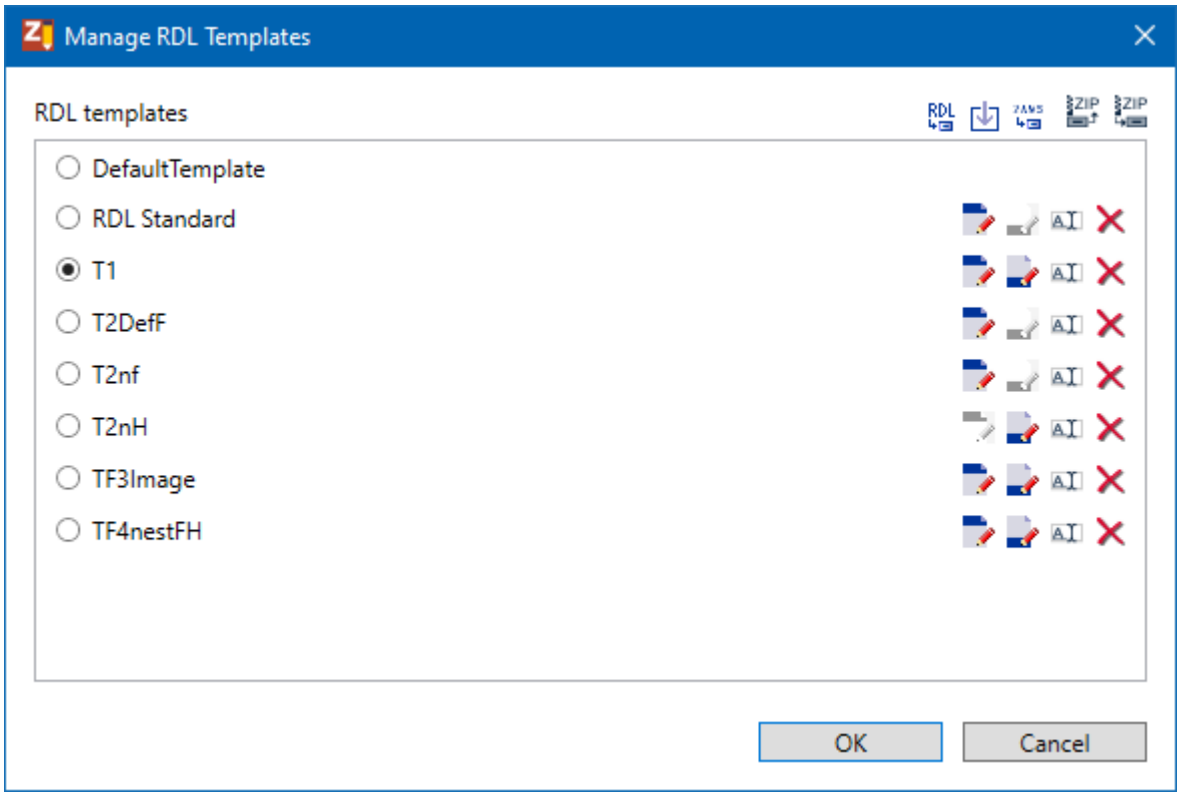
**To administer or edit RDL templates:**

1. Click, in the **Options** ribbon, on the **RDL templates** symbol.

   The dialog to select and edit RDL templates is opened.

2. Carry out the desired action by:
   - Selection of the RDL template to be used for the provision.
   - Restoring an RDL template from an RDL file, from a report or from other zenon Analyzer versions.
   - Export or import of RDL templates.
   - Editing the header and/or footer (on page 206).
   - Renaming of RDL templates.
   - Deletion of RDL templates.

## ADMINISTER RDL TEMPLATES DIALOG




| Option | Description |
|---|---|
| Symbol: **Create from RDL file** | Creates an RDL template from a file (on page 215) on the computer. |
| Symbol: **Create from report on the server** | Creates an RDL template from a report (on page 215) on the Analyzer server. |
| Symbol: **Import from previous version** | Starts the import of an RDL template from an older version (on page 217) of zenon Analyzer. |
| Symbol: **Select RDL templates for export** | Opens the dialog to export (on page 204) RDL templates. |
| Symbol: **Import RDL templates** | Opens the dialog to import (on page 204) RDL files. |
| **List of RDL templates** | Shows all existing RDL templates and allows them to be edited. |
| Symbol: **Header** | Opens the dialog to edit the header (on page 206).<br>Only active if the RDL template contains a header. Not available for **DefaultTemplate**. |

| Option | Description |
|---|---|
| Symbol: **Footer** | Opens the dialog to edit the footer (on page 206).<br>Only active if the RDL template contains a footer. Not available for **DefaultTemplate**. |
| Symbol: **Rename RDL template** | Opens the dialog to rename a template. |
| Symbol: **Delete** | Deletes the selected RDL template after requesting confirmation. Click on the symbol to show a button underneath it. Clicking on it carries out deletion.<br>Not available for **DefaultTemplate**. |
| **OK** | Applies settings and closes the dialog. |
| **Cancel** | Discards all changes and closes the dialog. |

## SELECT RDL TEMPLATES FOR PREPARATION

To select an RDL template for preparation:

1. Open the dialog to select and edit RDL templates.
2. Select the desired RDL template.
   To do this, click in front of the name of the RDL template in the option field.
3. Click on **OK**.

## RENAME RDL TEMPLATE

To rename an RDL template:

1. Open the dialog to select and edit RDL templates.
2. Click on the **Rename URDL Template** symbol next to the desired RDL template.

   The dialog for renaming is opened.
3. Enter the desired name.
   The following is applicable for the names:
   - Must not be empty.
   - Must not start with a space.
   - Must consist of valid characters.
     The following are valid: Letters, figures, underscores and spaces.
4. Click on **OK**.

   The new name is entered into the list

### DELETE RDL TEMPLATE

To delete an RDL template:

1. Open the dialog to select and edit RDL templates.
2. Click on the **Delete** symbol next to the desired RDL template.

   A green tick is shown below the symbol. This serves to double-check that you want to do it.
3. Click on the symbol with the green tick.

   The RDL template is deleted.

## 10.2 Export and import RDL templates

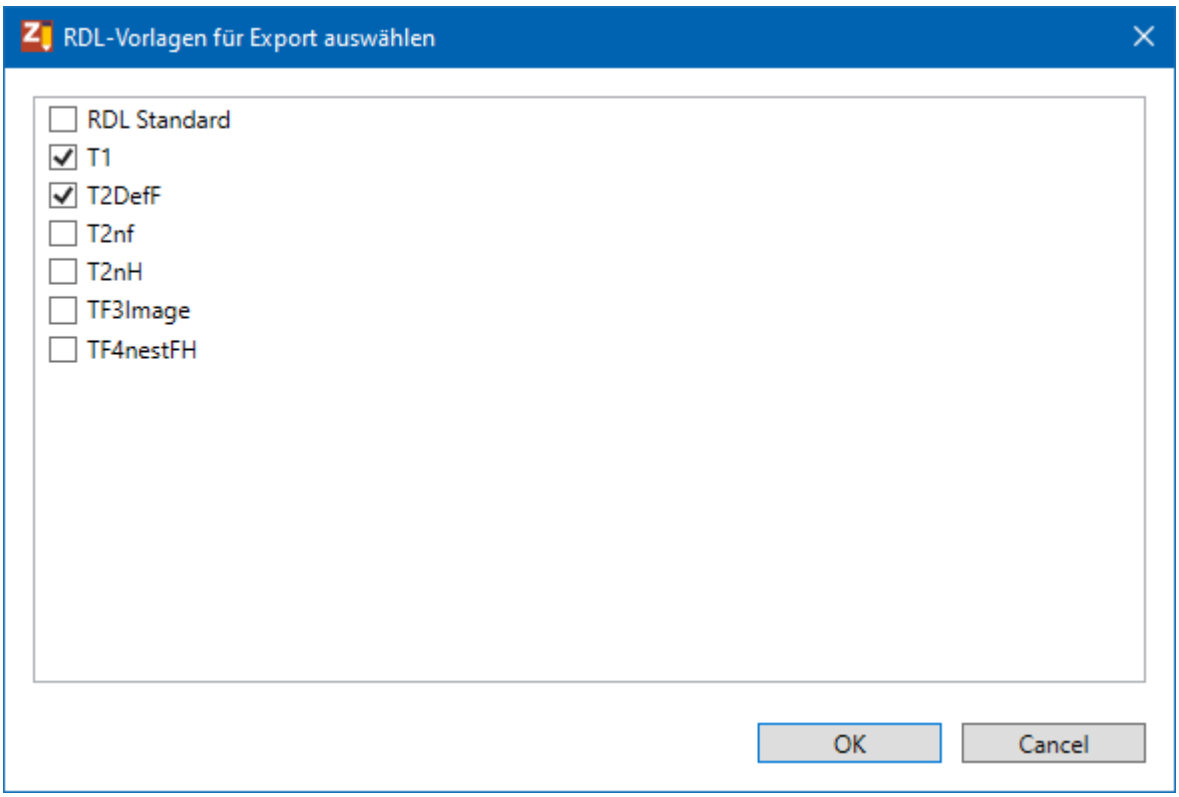
You can export and import RDL templates. Templates, for example, can thus transferred to other systems.

### EXPORT RDL TEMPLATES

To export RDL templates:

1. Open the dialog to select and edit RDL templates.
2. Click on the symbol for the export.

   The dialog to select the templates is opened.



3. Select the desired RDL templates.
   To do this, click in front of the name of the RDL template in the option field.
4. Click on **OK**.

   The dialog to select a file name and save location is opened.
5. Select the save location and enter a file name.

   The dialog is closed and the export file is saved in **ZIP** format.
6. Close the **manage RDL templates** dialog by clicking on **OK**.

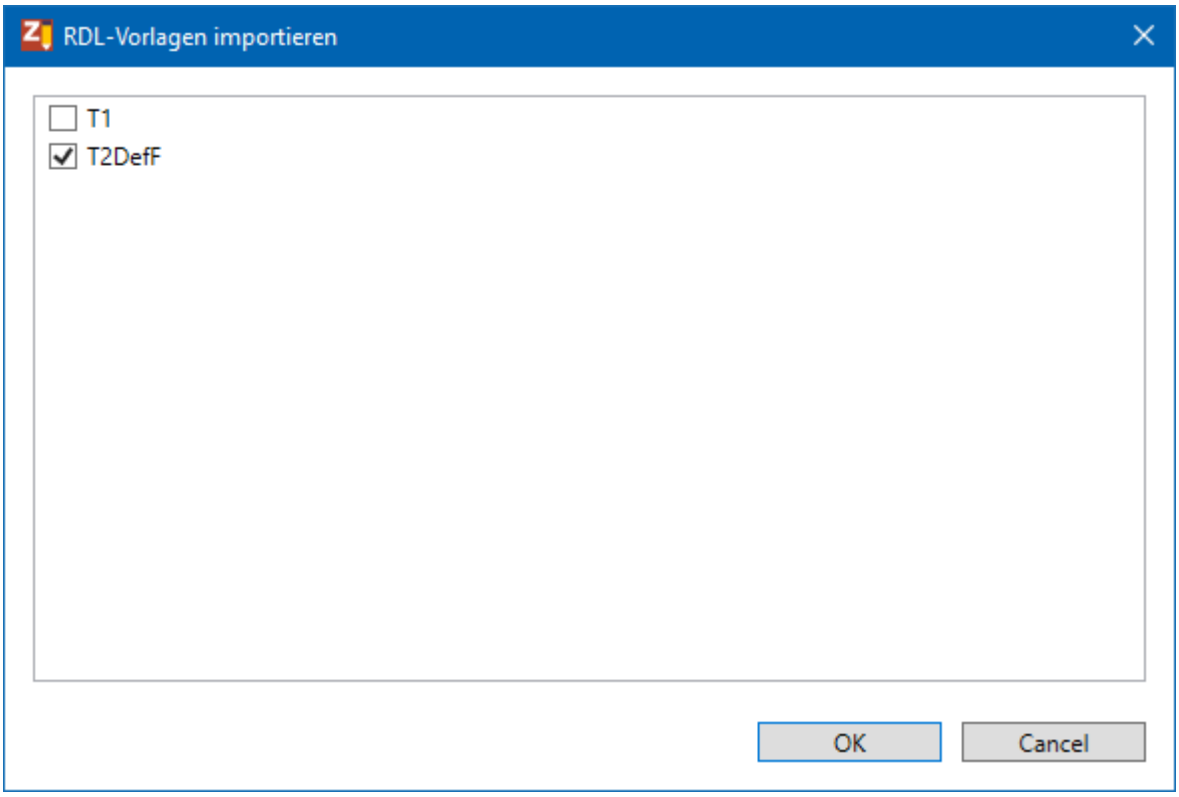
## IMPORT RDL TEMPLATES

To import RDL templates:

1. Open the dialog to select and edit RDL templates.
2. Click on the symbol for the import.

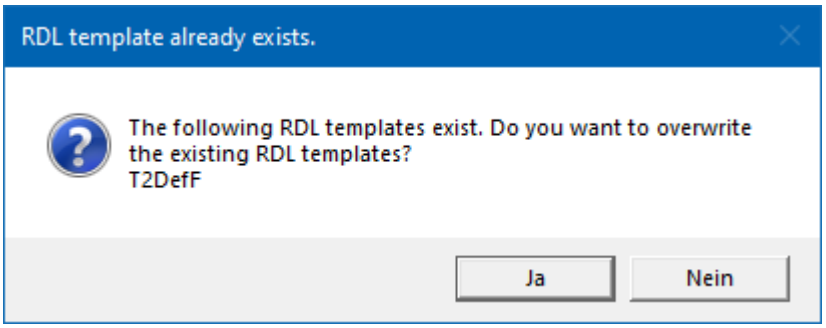
   The dialog to select an import file is opened:
3. Go to the save location of the desired import file
4. Select the file.
5. Click on **Open**.

   The dialog to select the RDL templates is opened:



6. Select the desired RDL templates.
   To do this, click in front of the name of the RDL template in the option field.
7. Click on **OK**.
8. The selected RDL templates are imported.

   A corresponding error message is shown if there is already a template.




   - **Yes**: Pre-existing RDL templates with the same name are overwritten by the import.
   - **No**: Only imports that are not yet present are imported. Pre-existing templates are ignored on import.

   **Hint:** To import pre-existing RDL templates without overwriting: Rename the existing template. Only carry out the import after this.
9. Close the **manage RDL templates** dialog by clicking on **OK**.

## 10.3 Edit header and footer

You can edit headers and footers of an RDL template.
**Exception: DefaultTemplate**

The header and footer are configured in the same dialog. The properties are applicable for each to the same extent.
The following can be configured:

- Header/Footer
- Elements in header/footer

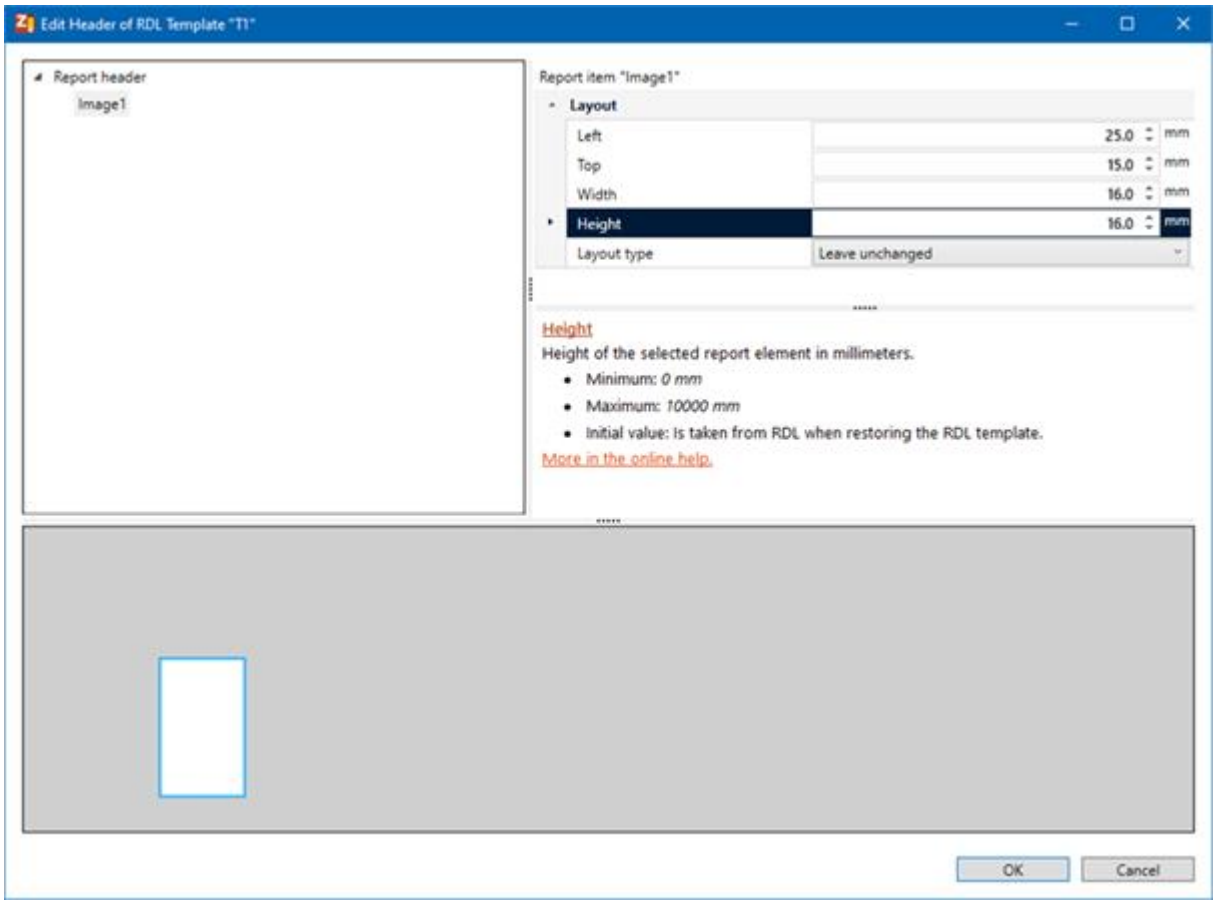
To edit a header or footer:

1. Open the dialog to select and edit RDL templates.
2. Click on the desired symbol next to the desired RDL template:
   - Editing the header.
   - Editing the footer

   The dialog for editing is opened.
3. Carry out the desired changes.

4. Close the dialog by clicking on **OK**.
5. Close the **manage RDL templates** dialog by clicking on **OK**.

## GENERAL DIALOG




| Option | Description |
|---|---|
| **Selection tree** | Hierarchical display of the header/footer and all subordinate elements.<br><br>Elements with validation errors are highlighted. |
| **Properties** | Display of all properties available for the selected element. |
| **Preview** | Shows the content of the RDL template in schematic form. The selected setting and your container are highlighted in color. |
| **OK** | Applies all settings and closes the dialog. |
| **Cancel** | Discards all changes and closes the dialog. |

### DISPLAY OF LINES

The following is applicable for the display of lines:

- Horizontal and vertical lines are shown as lines.
- Diagonal lines are shown as a rectangle. The rectangle serves as an overlap check at the same time.
  The course of the line is shown within the rectangle. The course is always shown the same regardless of whether the line has been selected.

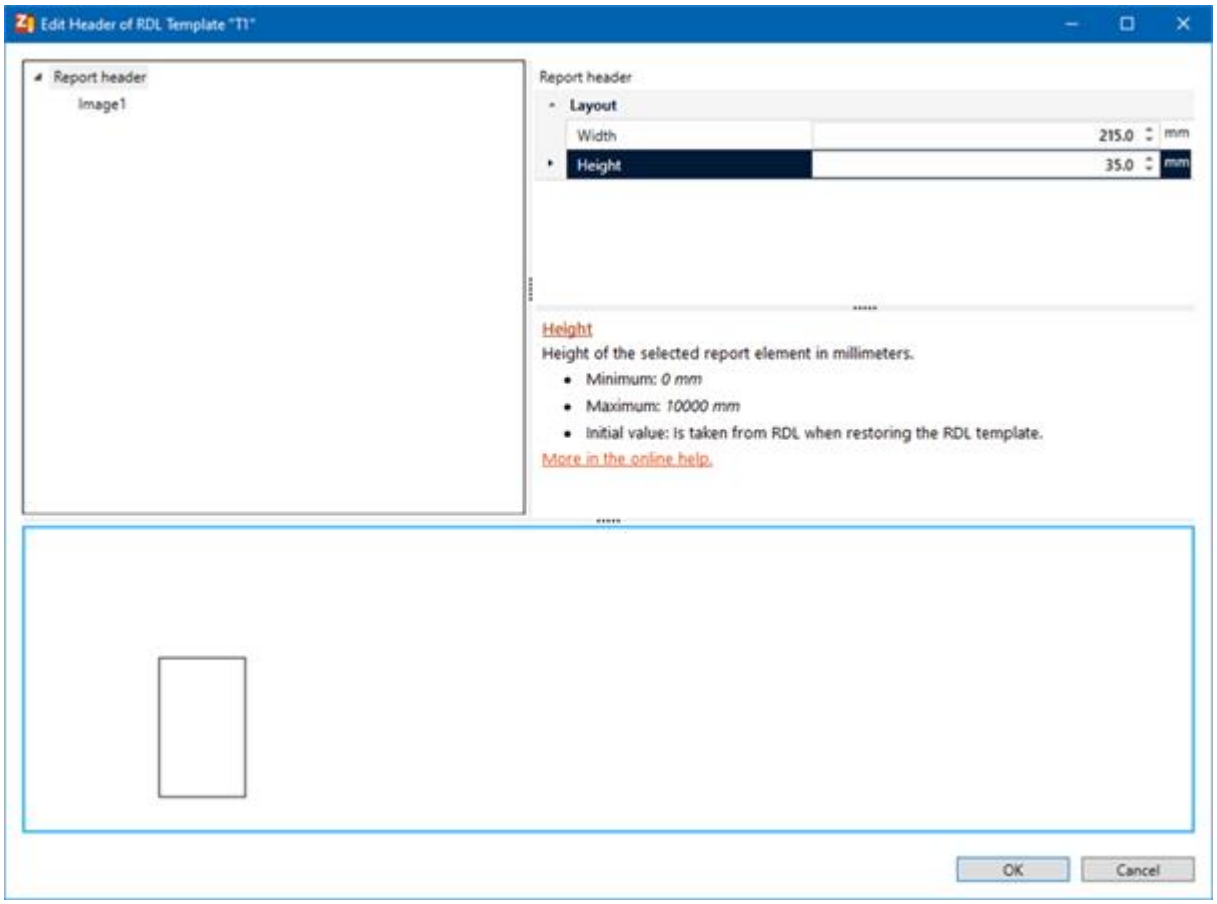
### VALIDATIONS

The following is applicable for the the configuration of the elements:

- No report element can protrude beyond its higher-level container.
  Direct contact with the limit is permitted.
  This applies for:
  - **Left**
  - **Top**
  - **Width**
  - **Height**
- Report elements must not overlap one another.
  Direct contact with other report elements is permitted.
  This is applicable for:
  - **Left**
  - **Top**
  - **Width**
  - **Height**
- Report elements must not be configured in such a way that they can overlap if the report has a certain width.
  This applies for:
  - **Layout type**
- Width and height must not be *0* at the same time.
  If the width is *0*, the height must be *>0*. If the height is *0*, the width must be *>0*.
- Your rectangle is used for validation with all elements. This also applies to lines.

## HEADER/FOOTER

Options for header and footer.

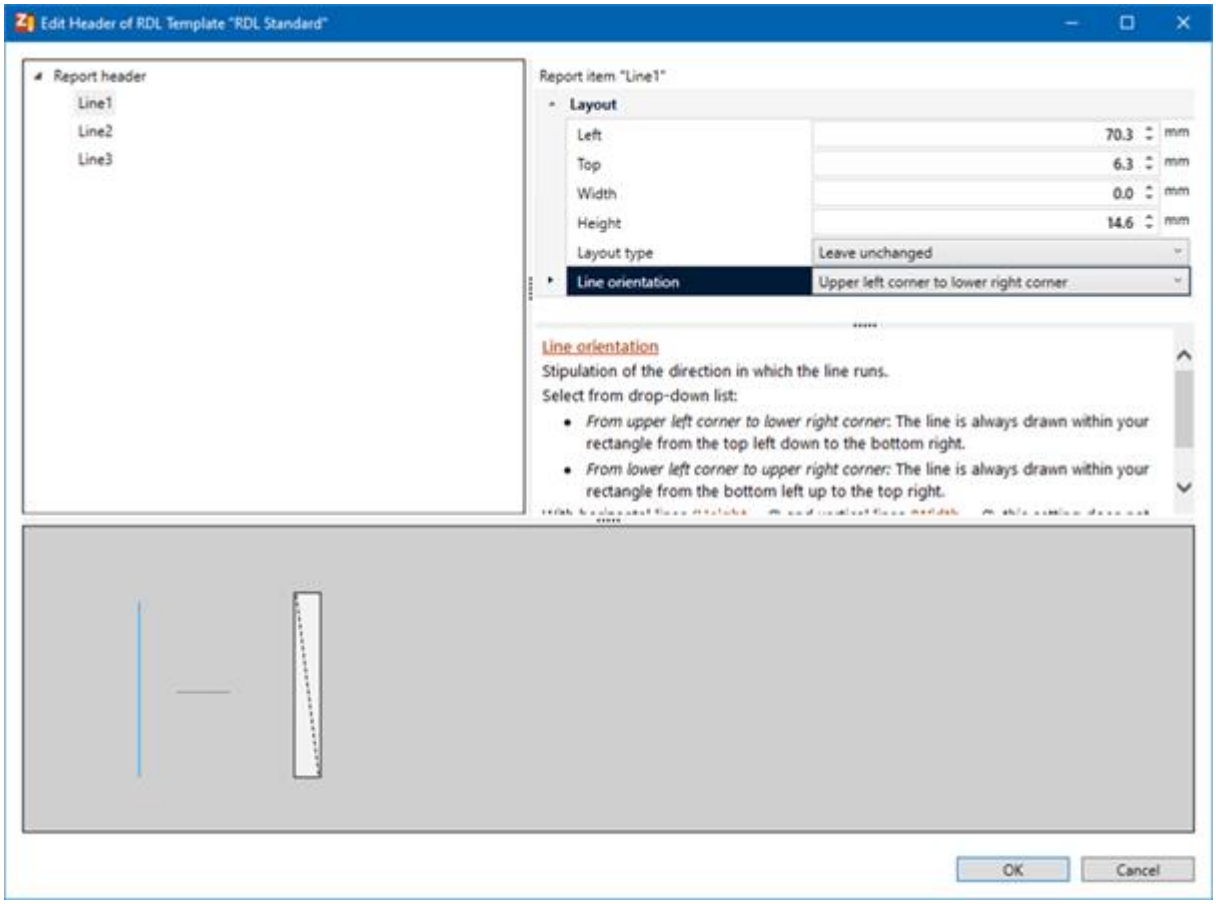



| Option | Description |
|---|---|
| **Width** | Width of the complete header or footer in millimeters.<br>▸ Minimum: *0 mm*<br>▸ Maximum: *10000 mm*<br>▸ Initial value: Is taken from RDL when restoring the RDL template.<br>**Note:** Reference width for the calculation of the layout when preparing a report.<br>That means: The header and/or footer in an RDL template is designed with the minimum width required in ZAMS. The width can grow for wider reports. |
| **Height** | Height of the complete header or footer in |

| Option | Description |
|---|---|
| | millimeters.<br>▸ Minimum: *0 mm*<br>▸ Maximum: *10000 mm*<br>▸ Initial value: Is taken from RDL when restoring the RDL template. |

## ELEMENTS

Options for elements in the header or footer.




| Option | Description |
|---|---|
| **Left** | Horizontal distance of the left upper point of the selected report element to the left edge of the higher-level container in millimeters.<br>▸ Minimum: *0 mm*<br>▸ Maximum: *10000 mm* |

| Option | Description |
|---|---|
| | ▸ Initial value: Is taken from RDL when restoring the RDL template. |
| **Top** | Vertical distance of the left upper point of the selected report element to the upper edge of the higher-level container in millimeters.<br>▸ Minimum: *0 mm*<br>▸ Maximum: *10000 mm*<br>▸ Initial value: Is taken from RDL when restoring the RDL template. |
| **Width** | Width of the selected report element in millimeters.<br>▸ Minimum: *0 mm*<br>▸ Maximum: *10000 mm*<br>▸ Initial value: Is taken from RDL when restoring the RDL template. |
| **Height** | Height of the selected report element in millimeters.<br>▸ Minimum: *0 mm*<br>▸ Maximum: *10000 mm*<br>▸ Initial value: Is taken from RDL when restoring the RDL template. |
| **Layout type** | Stipulates how the selected report element acts if the report is wider than the width of the header/footer.<br>Selection from drop-down list:<br>▸ *Leave unchanged*: The size and position of this report element remain unchanged. All further report elements contained in the report element also remain unchanged.<br>▸ *Move to the right*: The size of this report element remains the same. It is however moved right by the additional width available. All further report elements contained in the report element also remain unchanged.<br>▸ *Extend to the right*: This report element |

| Option | Description |
|---|---|
| | retains its position. The width is increased by the additional available width however. For all further elements contained in the report element, their configuration is applied for layout type.<br><br>Default: *Leave unchanged*:<br><br>Definition of *additional width available*: Minimum minus width of header/footer. Minimum comprises report width, report side width less left and right borders and report interactive width. If the result is less than *0*, *0* is taken.<br><br>**Note:** *Extend to the right* is always automatically applied for headers and footers. |
| **Line orientation** | Stipulation of the direction in which the line runs.<br><br>Select from drop-down list:<br>▸ *Upper left corner to lower right corner:* The line is always drawn within your rectangle from the top left down to the bottom right.<br>▸ *Lower left corner to upper right corner:* The line is always drawn within your rectangle from the bottom left up to the top right.<br><br>With horizontal lines ( height= *0*) and vertical lines (width= *0*), this setting does not have any effect on the appearance in the report.<br><br>Only available if a line has been selected. |

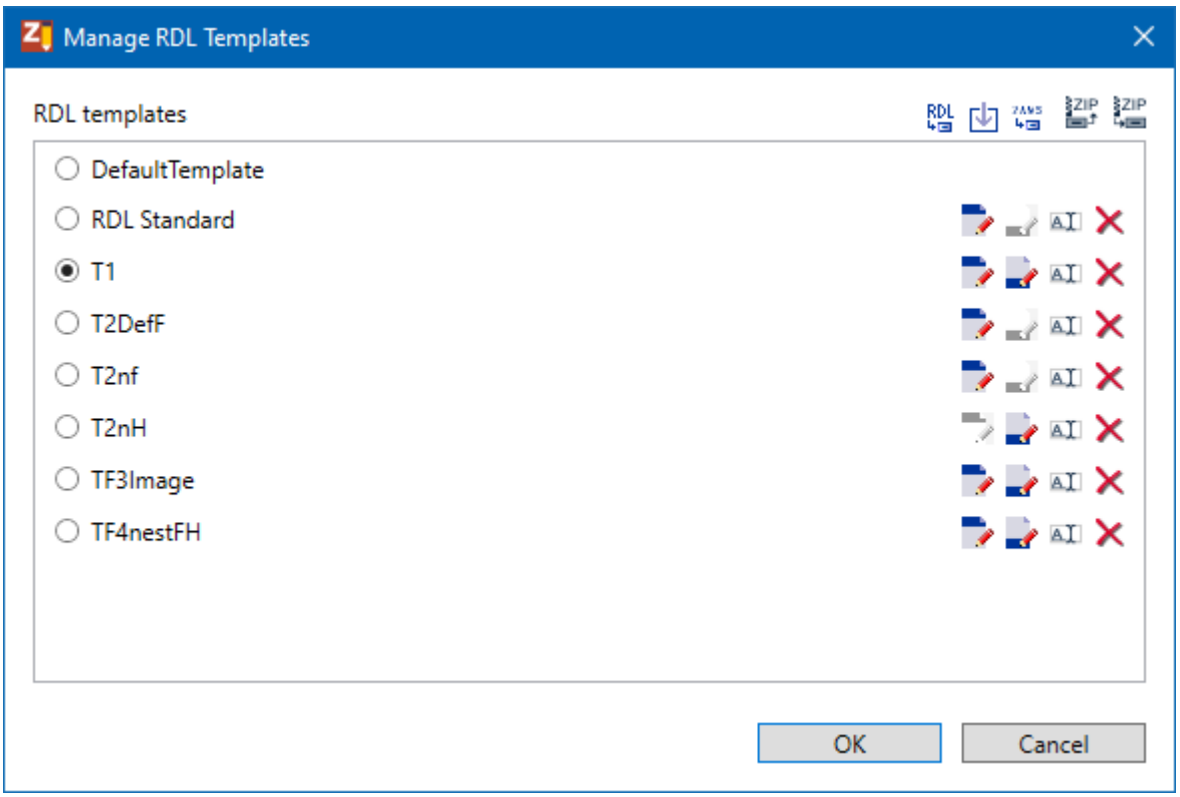
## 10.4 Restore RDL templates

Existing RDL templates can be restored in ZAMS.

To do this:

1. Click, in the **Options** ribbon, on the **RDL templates** symbol.

The dialog to select and edit RDL templates is opened.

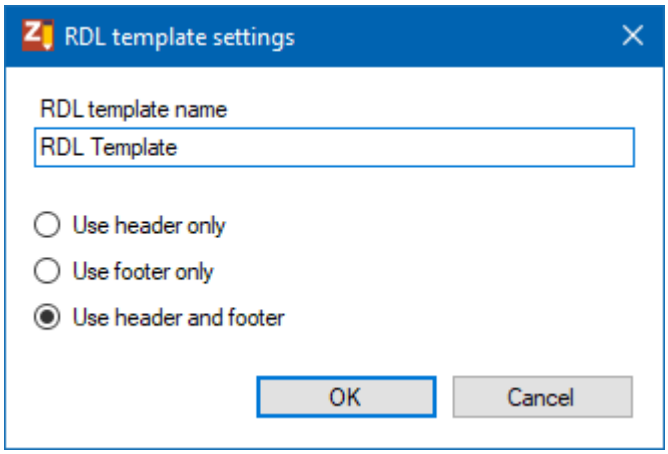



2. Click on the symbol for the desired restore mechanism.
   - From RDL file
   - From report on the server
   - From previous version

   The restore process is started.
3. Carry out the respective restore routine.
4. Close the dialog for restoring.
5. Close the **manage RDL templates** dialog by clicking on **OK**.

## 10.4.1 RDL template settings dialog

A dialog is opened when restoring RDL templates from files or reports. This makes it possible to configure the name and elements to be imported.




| Option | Description |
|---|---|
| **RDL template name** | Issue of a unique name.<br>Conditions:<br>▸ Must not be empty.<br>▸ Must not be used by another template. |
| **Use header only** | Only the header is taken from the source template.<br>Only available if the source file contains a header. |
| **Use footer only** | Only the footer is taken from the source template.<br>Only available if the source file contains a custom footer. |
| **Use header and footer** | The header and footer are taken from the source template.<br>Only available if the source file contains a header and a custom footer. |
| **OK** | Closes the dialog and saves the template in the list. This is only accepted definitively by clicking on **OK** in the **administer RDL templates** dialog. |
| **Cancel** | Discards all changes and closes the dialog. |

## 10.4.2 Create from RDL file

RDL templates can be read from RDL files on the computer. To do this:

1. Click in the RDL templates dialog on the **Read from RDL file** button.
2. The file browser is opened.
3. Navigate to the desired RDL file.
   The file must contain a header or a custom footer.
4. The dialog to configure the new template (on page 214) is opened.
5. Please use a unique name.
6. Select whether header and/or footer are used:
   The options that are available here depend on the selected RDL file.
7. Click on **OK**.
8. The new template is entered in the list

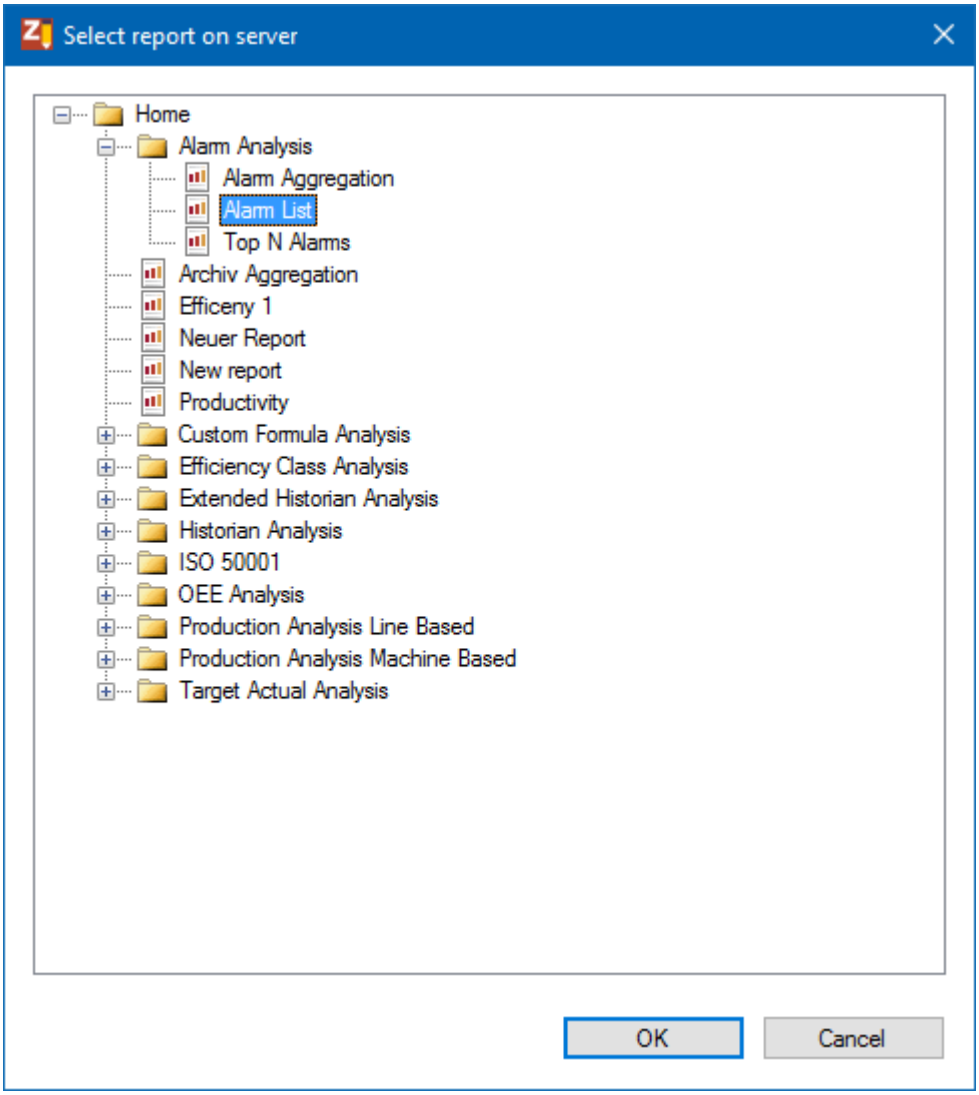
**Note:** The restored templates are only saved if the **administer RDL templates** dialog has been closed by clicking on **OK**.

## 10.4.3 Create from report on the server

RDL templates can be read from reports on the Analyzer Server. To do this:

1. Click, in the Administer RDL templates dialog, on the **Read from report in the server** button.

2. The dialog for selecting a report is opened
   All reports that are found are shown in a tree structure according to their save path.



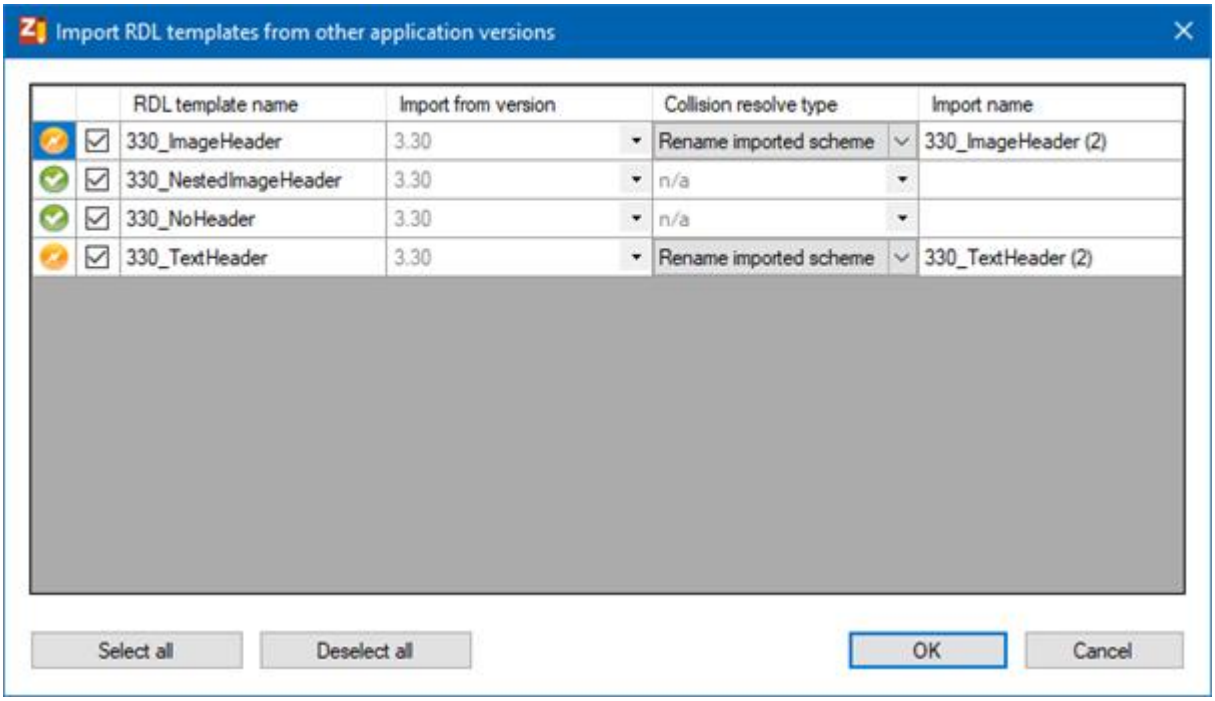

3. Navigate to the desired report.
   The report must contain a header or a custom footer.
4. The dialog to configure the new template (on page 214) is opened.
5. Please use an unique name.
6. Select whether header and/or footer are used:
   The options that are available depend on the selected RDL file.
7. Click on **OK**.
8. The new template is entered in the list

**Note:** The restored templates are only saved if the **administer RDL templates** dialog has been closed by clicking on **OK**.

## 10.4.4Import from previous version

RDL templates can be imported from RDL files of previous versions. To do this:

1. Click, in the **administer RDL templates** dialog, on the **Import RDL Templates from Previous Versions** button.
   The files to be imported must be in the *RDL_Templates* subfolder of the ZAMS version. For example: *%ProgramData%\COPA-DATA\zenonAnalyzer\ZAMS_330\RDL_Templates*.
2. The dialog with the list of all RDL files of a different version with a header or custom footer are opened.

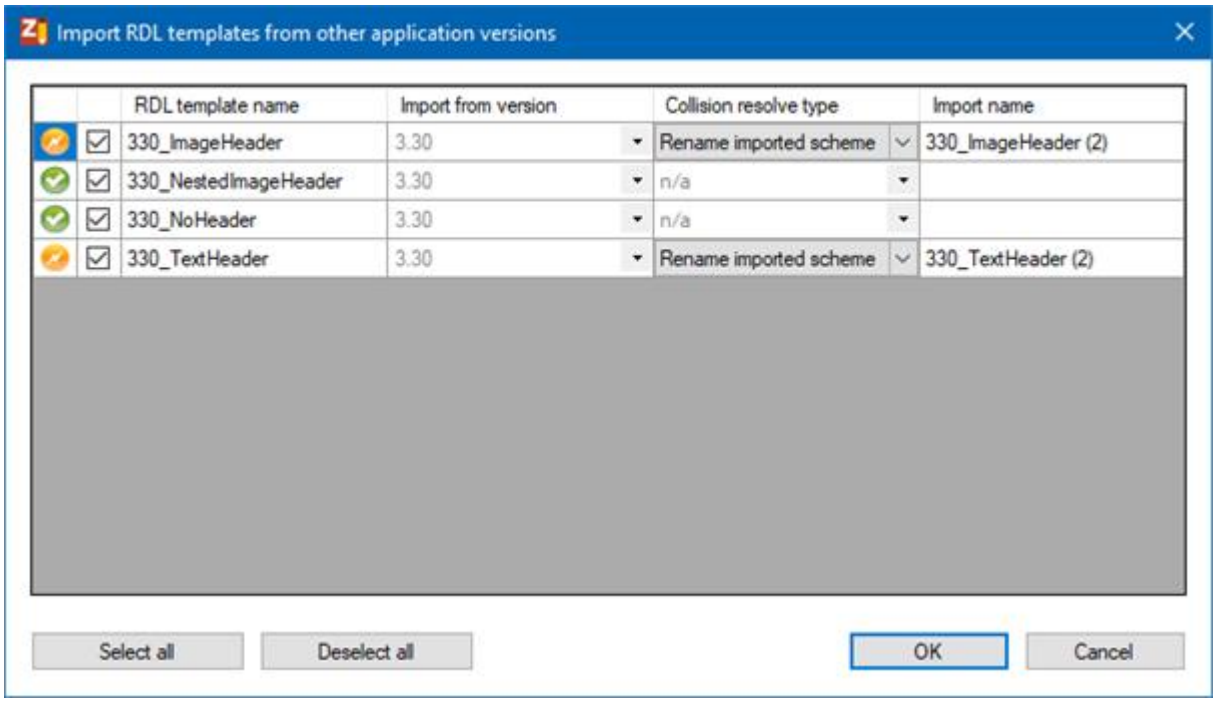



3. Select the desired templates.
4. Select the desired version if required.
5. If there are naming conflicts: Decide whether the template to be imported is to be renamed or the existing template is to be overwritten.
6. Give it a new, unique name if required.
7. Click on OK.

   The new templates are entered into the list

**Note:** The imported templates are only saved if the **administer RDL templates** dialog is closed by clicking on **OK**.

## IMPORT RDL TEMPLATES FROM OTHER PROGRAM VERSIONS




| Option | Description |
|---|---|
| **Status symbol** | Displays whether a template with this name already exists. |
| **Checkbox** | Selection of a template for import by ticking the checkbox. |
| **RDL template name** | Name of the selected RDL template.<br>Display only. |
| **Import from version** | Selection of the version of the selected RDL template from the drop-down list.<br><br>Only active if there are templates from different ZAMS versions with the same name. |
| **Collision resolve type** | Selection of actions for templates whose name is already in use:<br><br>▸ *Rename imported template*: The name is renamed during import. The current name in the **Import name** field is supplemented with a figure in brackets. The name can be individually amended in this field.<br><br>▸ *Overwrite existing template*: The existing RDL file is replaced by the RDL file that is to be imported.<br><br>Default: *Rename imported template* |

| Option | Description |
|---|---|
| | Only active if there is a naming conflict during import. |
| **Import name** | Entry of a unique name for the template to be imported:<br>▸ The name must not be empty.<br>▸ The name must not be used by another template.<br>Only active if there is a naming conflict on import and the conflict is triggered by renaming. |
| **Select all** | Clicking this selects all displayed templates. |
| **Clear selection** | Clicking this deselects the current selection. |
| **OK** | Applies settings and closes the dialog.<br>If a pre-existing template is to be overwritten, confirmation is requested. |
| **Cancel** | Discards all changes and closes the dialog. |

# 11 Back up and restore databases and reports

ZAMS provides two mechanisms for backing up and restoring data:

- Database backup: Allows the complete backup and restoring of databases, manually or automatically.
- Enhanced backup: Allows the individual selection of databases and reports for backing up and restoring.

## 11.1 Database backup

Allows the complete backup and restoring of databases, manually or automatically.

**A database backup can contain the following:**

- Analyzer database
- Non-Analyzer database
- Report server database

Each backup consists of precisely one database.

## 11.1.1 Manual database backups

Databases can be saved (on page 220) completely manually. In doing so, all available databases can be selected. The database is always backed up, report templates are not backed up.

Backup files can be restored (on page 224) and administered (on page 250). Whether a database can be backed up or restored depends on its type (on page 220).

Automated backups are described in the Automated data backups (on page 230) chapter.

### 11.1.1.1 Database types

A distinction is made between the following types of databases:

| Type | Description | Saving | Restore |
|---|---|---|---|
| **System databases** | Name is<br>▸ **master**<br>▸ **model**<br>▸ **msdb**<br>▸ **tempdb** | - | - |
| **Report server databases** | Name starts with<br>▸ **ReportServer$** | + | - * |
| **Analyzer metadata databases** | ▸ No system database<br>▸ No report server database.<br>▸ Analyzer metadata definition version can be established. | + | + |
| **Other databases** | None of the conditions for other types were met. | + | + |

* **Background:** To restore **Report server databases**, the **Report Server** service must be stopped and restarted after the restore, for which administrator rights on the Analyzer server are needed.

### 11.1.1.2 Create database backups

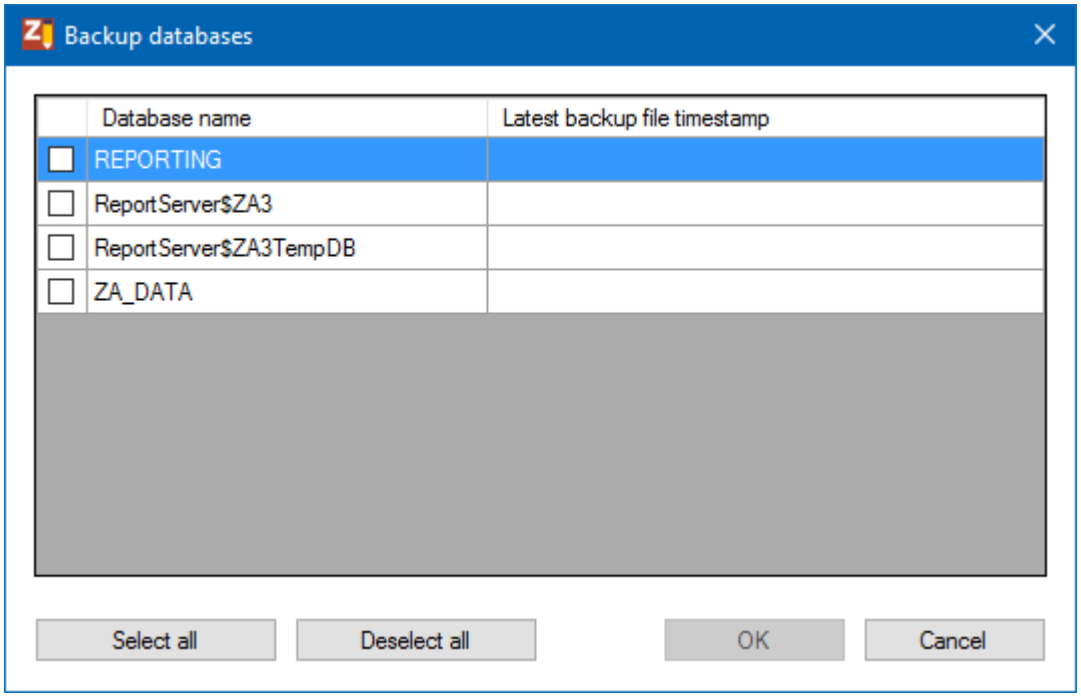
Backups of databases can be created provided their type allows this. You can find details on the restorable types in the Database types. (on page 220) chapter (on page 220)

## BACKUP DATABASES

To back up databases:

1. Open the **SQL Server** ribbon.
2. Select the **Create** entry in the **Database backup** ribbon group.

   The dialog for selecting a database is opened.
3. Activate the checkboxes in front of all databases to be backed up.
4. Click on **OK**.




| Option | Description |
|---|---|
| **List of databases** | Displays all databases available<br>▸ Checkbox: The checkbox must be activated to back up a database.<br>▸ **Database name**: Displays database name.<br>▸ **Date and time of the latest backup**: Shows date and time of the backup currently available.<br>The path and number of backups are defined in the **Options** (on page 29) menu, in the **Database backups** (on page 51) tab of the Settings (on page 36). |
| **Select all** | Selects all displayed databases for backup. |
| **Deselect all** | Deselects database selection. |

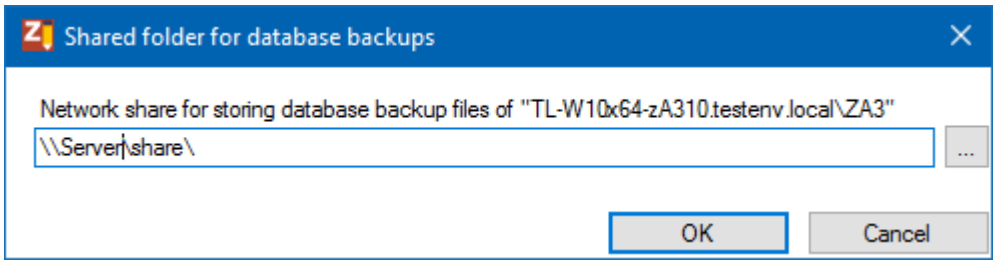
| Option | Description |
|---|---|
| **OK** | Accepts selection, closes dialog and creates backups. |
| **Cancel** | Discards changes and closes dialog. |

The size and position of the dialog can be changed. These settings are saved as user-dependent.

## STORAGE PATH FOR DATABASE BACKUP FILES:

The first time a backup request is made and a path has not yet been established, you are requested to define a save path. This path is then used for all backups and restorations. This path is administered in the options in the Database backups (on page 51) tab of the Settings (on page 36).

**Note:** It is recommended that a path on the Analyzer computer is used for backup.




| Option | Description |
|---|---|
| **Network share path for storing database backup files of [database]** | A valid UNC path must be entered.<br><br>Clicking on the **...** button opens the dialog (on page 347) to select a network share.<br><br>A check is made if:<br>▸ The syntax of the path is valid if: Only valid paths unlock the **OK** button.<br>▸ The path exists: When clicking on **OK**, the path is only accepted if it can also be accessed.<br>▸ The path is different to that already used: If a path is defined that is different to a path that has already been used, a corresponding message is given. The path can be created. The pre-existing database backup job can then be activated, deactivated and deleted, but can no longer be edited.<br><br>The configured path is saved individually for each user. |

| Option | Description |
|---|---|
| | **Attention:** The access rights to network shares must be set correctly. For details, see the **Set access rights to network share correctly**. |
| **OK** | Accepts the path and closes the dialog. |
| **Cancel** | Discards changes and closes the dialog. |

### SET ACCESS RIGHTS TO NETWORK SHARE CORRECTLY

In order for all database backup or restore actions to run correctly, the access rights to the network share of the database backup folder must be correct. This path is administered in the settings (on page 36).
In doing so, the following applies:

- The folder must be on the Analyzer Server, because defined users must access it locally on the Analyzer Server.
- Because the folder must be accessible by both the Analyzer Server and the ZAMS computer with the same path, it must be authorized in the network. The folder is then accessible with the same path via a UNC path everywhere in the network.
- The following users must have full access to the network share:
  - **NT SERVICE\MSSQL$ZA3**: For the creation and restoration of backups.
    Defined **L**ocally on the Analyzer server. Virtual user, derived from the **SYSTEM**, in whose context the SQL Server instance is running.
  - **NT SERVICE\SQLAgent$ZA3**: For automatic creation of backups.
    Defined **L**ocally on the Analyzer server. Virtual user, derived from the **SYSTEM**, in whose context the SQL Server agent is running.
  - Every ZAMS user: To create and restore backups, administer backup files and administer automated backup jobs.

### BACKUP FILE NAME

The file name of a database backup file follows this scheme: **[database name]_yyyy_MM_dd_HH_mm_ss.bak**

e.g.: **ZA_DATA_2013_02_12_14_11_35.bak =** backup of **ZA_DATA** on *12.2.2013* at *14:11:35*

### 11.1.1.3 Restore database backups

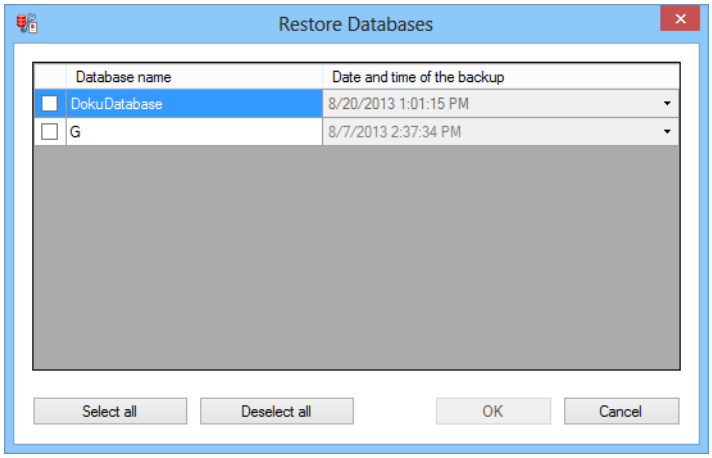
Databases that have been backed up can be restored. You can find details on the restorable types in the Database types. (on page 220) chapter (on page 220)

## RESTORE DATABASE BACKUPS

To restore database backups:

1. Open the **SQL Server** ribbon.
2. Select the **Restore** entry in the **Database backup** ribbon group.

   The dialog for selecting a database is opened.
3. Activate the checkboxes in front of all databases to be restored.
4. Select, in the **Time stamp of most recent backup** column, the desired version from the drop-down list.
5. Click on **OK**.




| Option | Description |
|---|---|
| **List of databases** | Displays all databases available<br>▸ Checkbox: The checkbox must be activated to restore a database.<br>▸ **Database name**: Shows the database name.<br>▸ **Latest backup file timestamp**: Shows drop-down list with data and time of all backups available. |
| **Select all** | Selects all displayed databases for backup. |
| **Deselect all** | Deselects database selection. |
| **OK** | Accepts selection, closes dialog and restores selected saved database |

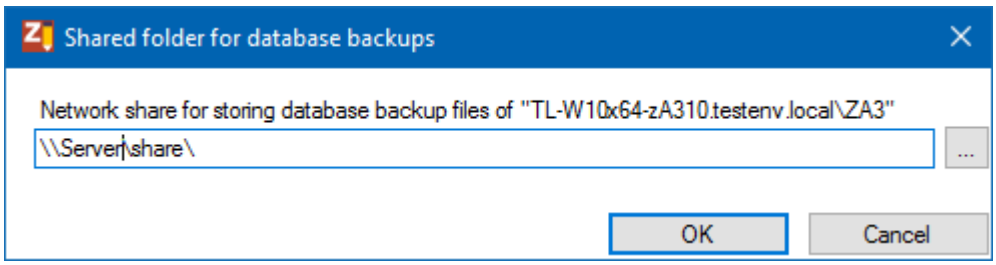
| Option | Description |
|---|---|
| | backups. In doing so, please note:<br>▸ If the currently-active metadata database is to be restored by a backup, the connection must be reestablished after the restore. The user must confirm this before starting the restore.<br>▸ For each metadata database, after successful restoration, the version of the metadata structure in the database is established and a structure test is carried out. If an obsolete structure is established in at lest one database, the user has the possibility to start the database conversion directly. This option is inactive if the connection must be reestablished after the restore. |
| **Cancel** | Discards changes and closes dialog. |

The size and position of the dialog can be changed. These settings are saved as user-dependent.

## STORAGE PATH FOR DATABASE BACKUP FILES:

The first time a backup request is made and a path has not yet been established, you are requested to define a save path. This path is then used for all backups and restorations. This path is administered in the options in the Database backups (on page 51) tab of the Settings (on page 36).

**Note:** It is recommended that a path on the Analyzer computer is used for backup.




| Option | Description |
|---|---|
| **Network share path for storing database backup files of [database]** | A valid UNC path must be entered.<br>Clicking on the **...** button opens the dialog (on page 347) to select a network share.<br>A check is made if:<br>▸ The syntax of the path is valid if:<br>Only valid paths unlock the **OK** button.<br>▸ The path exists:<br>When clicking on **OK**, the path is only accepted if it can also be accessed. |

| Option | Description |
|---|---|
| | ▸ The path is different to that already used:<br>If a path is defined that is different to a path that has already been used, a corresponding message is given. The path can be created. The pre-existing database backup job can then be activated, deactivated and deleted, but can no longer be edited.<br><br>The configured path is saved individually for each user.<br><br>**Attention:** The access rights to network shares must be set correctly. For details, see the **Set access rights to network share correctly**. |
| **OK** | Accepts the path and closes the dialog. |
| **Cancel** | Discards changes and closes the dialog. |

### SET ACCESS RIGHTS TO NETWORK SHARE CORRECTLY

In order for all database backup or restore actions to run correctly, the access rights to the network share of the database backup folder must be correct. This path is administered in the settings (on page 36).
In doing so, the following applies:

- The folder must be on the Analyzer Server, because defined users must access it locally on the Analyzer Server.
- Because the folder must be accessible by both the Analyzer Server and the ZAMS computer with the same path, it must be authorized in the network. The folder is then accessible with the same path via a UNC path everywhere in the network.
- The following users must have full access to the network share:
  - **NT SERVICE\MSSQL$ZA3**: For the creation and restoration of backups.
    Defined **L**ocally on the Analyzer server. Virtual user, derived from the **SYSTEM**, in whose context the SQL Server instance is running.
  - **NT SERVICE\SQLAgent$ZA3**: For automatic creation of backups.
    Defined **L**ocally on the Analyzer server. Virtual user, derived from the **SYSTEM**, in whose context the SQL Server agent is running.
  - Every ZAMS user: To create and restore backups, administer backup files and administer automated backup jobs.

#### BACKUP FILE NAME

The file name of a database backup file follows this scheme: **[database name]_yyyy_MM_dd_HH_mm_ss.bak**

e.g.: **ZA_DATA_2013_02_12_14_11_35.bak =** backup of **ZA_DATA** on *12.2.2013* at *14:11:35*

### 11.1.2 Restore database backup file as new database

A database backup file can be restored as a new database. In doing so, the backup file can also come from a database that is not yet on the SQL server instance.

The database backup file must meet the following requirements:

- The name of the database backup file must correspond to the following syntax: **[database name]_[yyyy]_[MM]_[dd]_[HH]_[mm]_[ss].bak**.
- There is only one database backup in the database backup file.
- The database saved in the backup file has the exact name that appears in the filename of the backup file.
- The database backup file can be checked for corruption/manipulation by means of a checksum.

All backup files created with ZAMS meet these requirements.

The target database name can be identical to the source database name, provided there is not yet a database with this name. An existing database can thus be transferred from one Analyzer server to the other by:

- Saving it on the original server
- Copying the backup file
- Restoring to the target server with new names that correspond to the old names

#### RESTORE DATABASE BACKUP AS NEW DATABASE

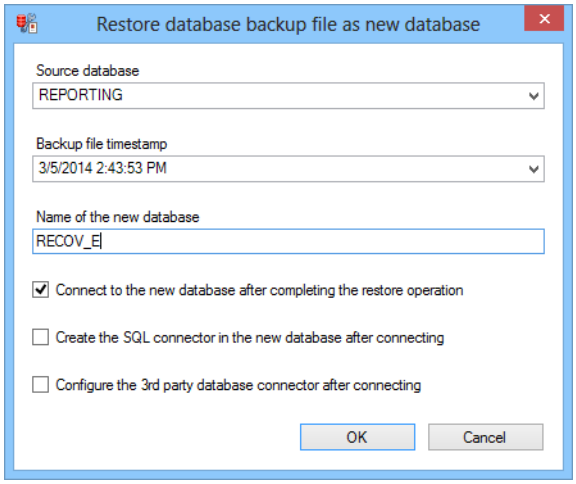
To restore a backup as a new database:

1. Open the **SQL Server** ribbon.
2. Select the **Restore** -> **Restore as new database** entry in the **Database backup** ribbon group.

   The dialog for selecting a backup file is opened
3. Select the desired database
4. Enter a name for the new database
5. Close the dialog by clicking on **OK**.

**Note:** If there are conflicts when synchronizing the user access rights, the user is informed by means of a dialog and can decide whether the database should nevertheless be created.

## RESTORING A DATABASE BACKUP FILE AS A NEW DATABASE




| Option | Description |
|---|---|
| **Source database** | Selection of the source database from a drop-down list.<br><br>The source database is the database that is contained in the backup file. All database files found are listed. |
| **Backup file timestamp** | Selection of the time stamp that is to be restored. All backup files of the selected database available are listed according to the time stamp of their backup. |
| **Name of the new database** | Entry of the name for the new database.<br><br>The name must meet the following criteria:<br>▸ Must not remain empty.<br>▸ Must not be used by a database that is already present on the target server.<br>This check is not case sensitive. For example: The name **DATA** cannot be used if there is already a database called **data**.<br><br>The **OK** button can only be used if the validation of the name is successful. |
| **Connect to the new database after completing the restore operation** | *Active*: A connection to the new database is also established when restoring.<br><br>Activated and cannot be operated if the **Create the SQL** |

| Option | Description |
|---|---|
| | **connector in the new database after connecting** option is active. |
| **Create the SQL connector in the new database after connecting** | ▸ *Active*: When restoring, SQL connector creation (on page 126) is started after the connection to the new database has been established.<br><br>Can only be activated if the **Connect to the new database after completing the restore operation** option is active. |
| **Configure the 3rd party database connector after connecting** | ▸ *Active*: When restoring after establishing a connection to the new database, the configuration (on page 147) of the import from third-party databases is started.<br><br>Note: If **Create the SQL connector in the new database after connecting** and **Configure the 3rd party database connector after connecting** have been activated, the configuration is carried out in this sequence:<br>▸ SQL-Connector<br>▸ Import of third-party databases<br><br>Can only be activated if the **Connect to the new database after completing the restore operation** option is active. |
| **OK** | Applies settings and closes the dialog. |
| **Cancel** | Discards all changes and closes the dialog. |

### 11.1.3 Restore Reporting Services database backup

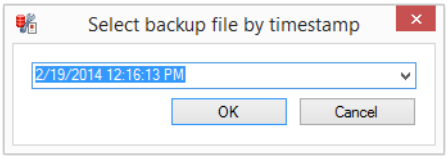
Backups of the reporting services database can be restored in ZAMS if the Analyzer server is on the same server as ZAMS.

To restore a backup:

1. Select, in the **SQL Server** (on page 27) ribbon, the **Restore Reporting Services database backup** command.
   This is only available if ZAMS is connected to an Analyzer server that is on the same computer as ZAMS. The comparison is carried out via the NetBIOS names of the local computers supplied by the .NET framework and the NetBIOS names of the SQL Server computer supplied by the SQL Server connection object.
2. The dialog for selecting a backup is opened
3. Select the desired backup.

4. Confirm the restore by clicking **OK**.

## RESTORE BACKUP FILE DIALOG




| Option | Description |
|---|---|
| **Drop-down list** | Selection of the file to be restored. Identification is via the time stamp of the backup. |
| **OK** | Applies settings and closes the dialog. |
| **Cancel** | Discards all changes and closes the dialog. |

1.

## 11.1.4 Administrate automated database backups

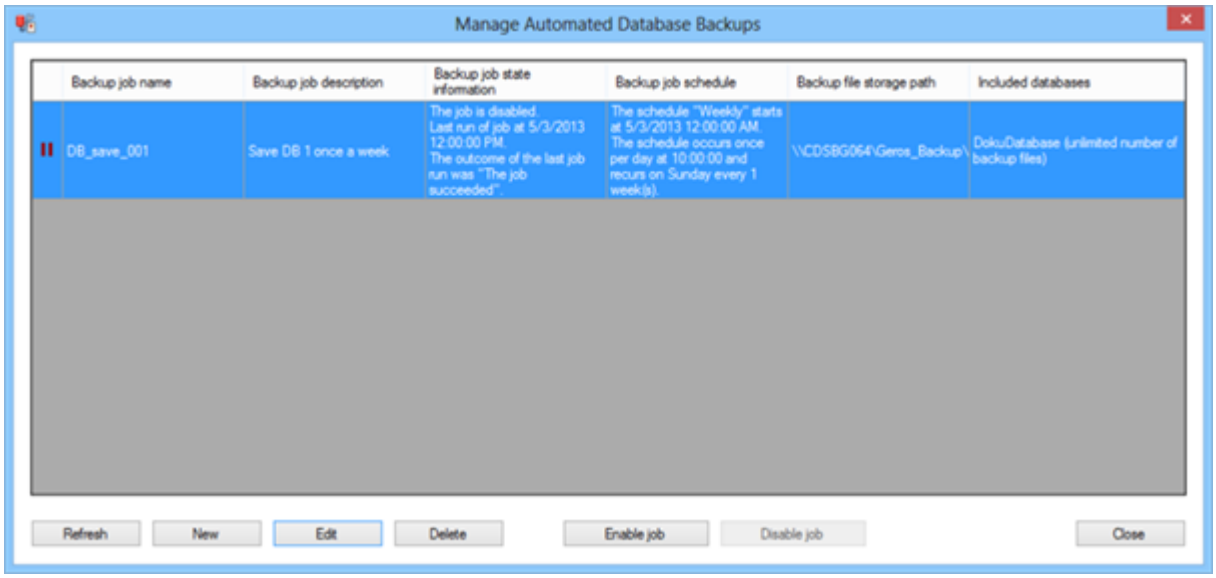
Database backups can be made automatically. These backups can be administered in their own dialog (on page 250).

**Note:** Automated backups should be configured so that they run when the Analyzer server has nothing to do. In doing so, report subscriptions must be taken into account. If, for example, subscriptions are processed every Sunday at 02:00:00, this is not a suitable tome to make a database backup.

To set up or edit an automated backup:

1. Open the **SQL-Server** ribbon.
2. Select the **Automated** entry in the **Database backup** ribbon group.

The dialog for administering the automated backups is opened.



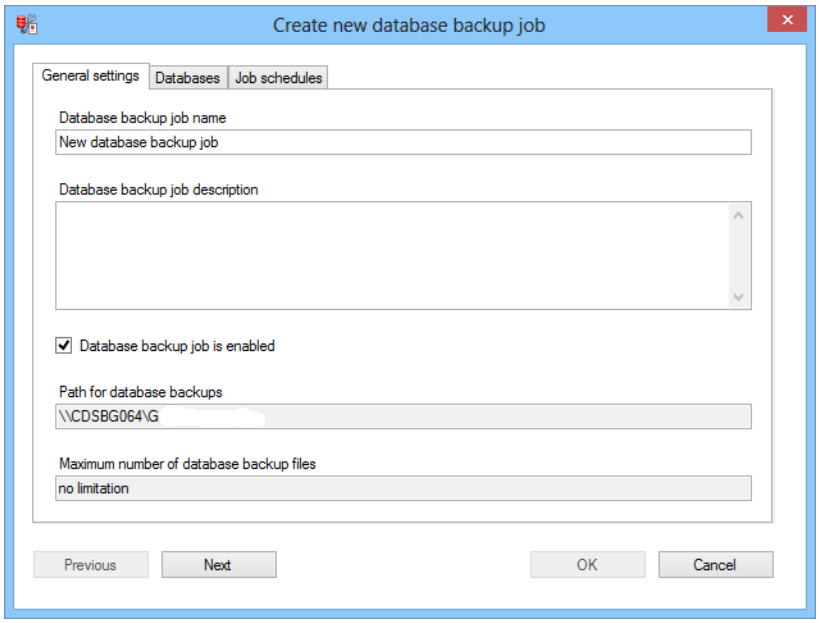

| Option | Description |
|---|---|
| **Symbol** | Displays whether the backup job is active or inactive. |
| **List of backup jobs** | Table of all recognized backup jobs. The following are displayed:<br>▸ **Name**: Distinct name of the backup job. Capitalization/use of small letters is not checked.<br>▸ **Description**: Individual description of the job.<br>▸ **Status information**: Note regarding whether the backup job is active, when it was carried out for the last time and what the result of th last execution was.<br>▸ **Schedule**: Description of the assigned schedule<br>▸ **Storage path**: Path for database backups.<br>▸ **Included databases**: List of the databases to be backed up and a note stating whether there is a limit to the number of files for the backup files and if so, how many.<br>Only one job can be selected at a time. |
| **Refresh** | Updates the content of the list. |
| **New** | Creates a new backup job.<br>To do this, a dialog is opened with the configuration for:<br>▸ General settings (on page 236) |

| Option | Description |
|---|---|
| | ▸ Databases (on page 237)<br>▸ Job schedules (on page 238) |
| **Edit** | Opens the selected backup job for editing with the dialog for:<br>▸ General settings (on page 236)<br>▸ Databases (on page 237)<br>▸ Job schedules (on page 238) |
| **Delete** | Deletes the selected backup after requesting confirmation. |
| **Enable Job** | Activates the selected backup job. |
| **Disable job** | Activates the selected backup job. |
| **Close** | Closes the dialog. |

The size and position of the dialog can be changed. These settings are saved as user-dependent.

## CREATING AND EDITING BACKUP JOBS

Backup jobs are configured in a dialog with three tabs. The dialog is opened by clicking on the **New** or **Edit** button.



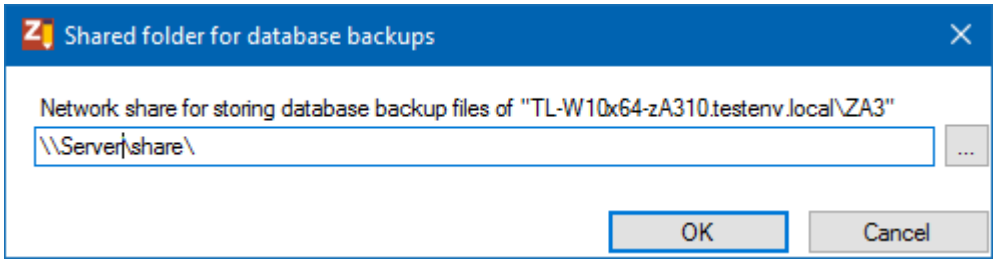

| Option | Description |
|---|---|
| **General settings** (on page 236) | Configuration of the general settings for a database backup. |

| Option | Description |
|---|---|
| **Databases** (on page 237) | Selection of the databases to be backed up. |
| **Job schedules** (on page 238) | Schedules for the backup with details of:<br>▸ General settings (on page 240)<br>▸ Recurrence (on page 241)<br>▸ In day recurrence (on page 246)<br>▸ Duration (on page 248) |
| **OK** | Applies all changes in all tabs and closes the dialog. |
| **Cancel** | Discards all changes in all tabs and closes the dialog. |

## STORAGE PATH FOR DATABASE BACKUP FILES:

The first time a backup request is made and a path has not yet been established, you are requested to define a save path. This path is then used for all backups and restorations. This path is administered in the options in the Database backups (on page 51) tab of the Settings (on page 36).

**Note:** It is recommended that a path on the Analyzer computer is used for backup.




| Option | Description |
|---|---|
| **Network share path for storing database backup files of [database]** | A valid UNC path must be entered.<br>Clicking on the **...** button opens the dialog (on page 347) to select a network share.<br>A check is made if:<br>▸ The syntax of the path is valid if:<br>Only valid paths unlock the **OK** button.<br>▸ The path exists:<br>When clicking on **OK**, the path is only accepted if it can also be accessed.<br>▸ The path is different to that already used:<br>If a path is defined that is different to a path that |

| Option | Description |
|---|---|
| | has already been used, a corresponding message is given. The path can be created. The pre-existing database backup job can then be activated, deactivated and deleted, but can no longer be edited.<br><br>The configured path is saved individually for each user.<br><br>**Attention:** The access rights to network shares must be set correctly. For details, see the **Set access rights to network share correctly**. |
| **OK** | Accepts the path and closes the dialog. |
| **Cancel** | Discards changes and closes the dialog. |

### SET ACCESS RIGHTS TO NETWORK SHARE CORRECTLY

In order for all database backup or restore actions to run correctly, the access rights to the network share of the database backup folder must be correct. This path is administered in the settings (on page 36).
In doing so, the following applies:

- The folder must be on the Analyzer Server, because defined users must access it locally on the Analyzer Server.
- Because the folder must be accessible by both the Analyzer Server and the ZAMS computer with the same path, it must be authorized in the network. The folder is then accessible with the same path via a UNC path everywhere in the network.
- The following users must have full access to the network share:
  - **NT SERVICE\MSSQL$ZA3**: For the creation and restoration of backups.
    Defined **L**ocally on the Analyzer server. Virtual user, derived from the **SYSTEM**, in whose context the SQL Server instance is running.
  - **NT SERVICE\SQLAgent$ZA3**: For automatic creation of backups.
    Defined **L**ocally on the Analyzer server. Virtual user, derived from the **SYSTEM**, in whose context the SQL Server agent is running.
  - Every ZAMS user: To create and restore backups, administer backup files and administer automated backup jobs.

### BACKUP FILE NAME

The file name of a database backup file follows this scheme: **[database name]_yyyy_MM_dd_HH_mm_ss.bak**

e.g.: **ZA_DATA_2013_02_12_14_11_35.bak =** backup of **ZA_DATA** on *12.2.2013* at *14:11:35*

### 11.1.4.1 Definition of database backup job

Because many jobs are executed automatically on the SQL server, the identification of a job as a database backup is defined restrictively. This prevents database backup jobs influencing other jobs, such as subscriptions.

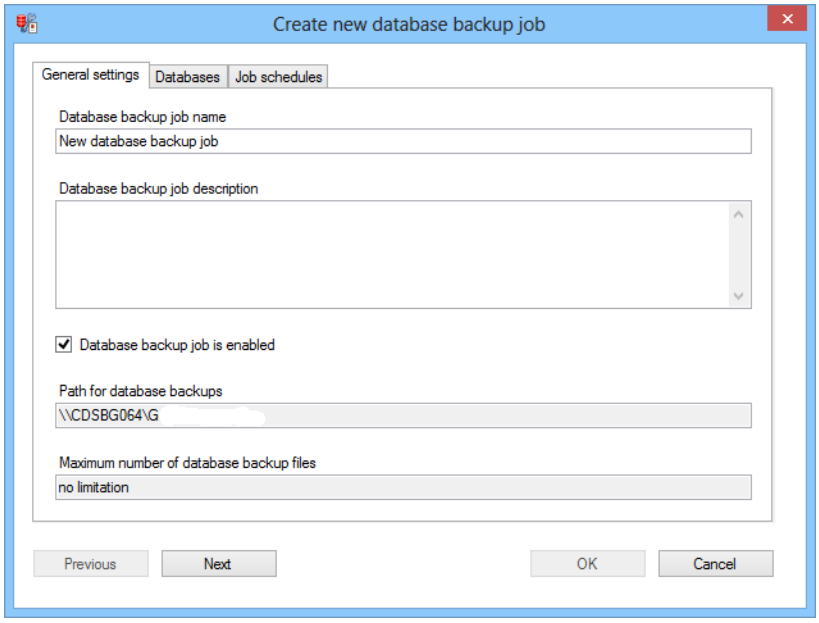
An SQL Server agent job is only recognized as a database backup job if all conditions have been met:

1. The job is a from the **database maintenance** category.
2. The job only contains steps that correspond to one of the following conditions:

- The name starts with **Backup** and the type is *Transact SQL*.
  Sub-conditions for these steps:
  - Fields for database names and file path are present in the command text and are filled with editable variables.
  - There is no other step for the database, neither **Backup** nor **Reduce Files**.
  - The command text corresponds to the SQL script template **DbAutoBackup_RunBackup** set up with the database name and file path.
- The name starts with **Reduce Files** and the type is *CMD Execute*.
  Sub-conditions for these steps:
  - Fields for file path and database GUID are present in the command text and are filled with editable variables.
  - Combination of file path and database GUID leads to a BAT file.
  - The command text corresponds to the SQL script template **DbAutoBackup_CallBat** set up with the file path and database GUID.
  - In the BAT file, the fields for database name, file path and maximum number of files are present and filled with editable values.
  - There is not yet any other *Reduce Files* step for this database.
  - The script text in the BAT file corresponds to the SQL script template **DbAutoBackup_BatReduceFiles** set up with file path, database GUID, database name and maximum number of files.
- Furthermore, all steps including the sub-points of the **Reduce Files** steps must use the same file path.

### 11.1.4.2 General settings

General settings for automated backups are configured in this tab.

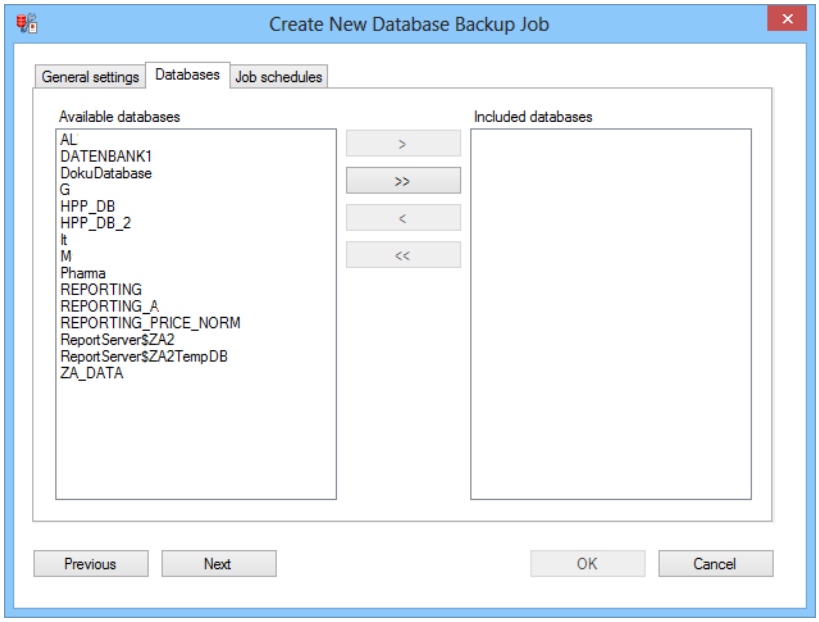



| Option | Description |
|---|---|
| **Database backup job name** | Entry of a unique name for the database backup. |
| **Database backup job description** | Entry of a description for the database backup job. |
| **Database backup job is activated** | *Active*: The job is carried out according to its configuration and your schedule (on page 238). |
| **Backup file folders** | Folder in which backup files are saved. Display only.<br>The path and number of backups are defined in the **Options** (on page 29) menu, in the **Database backups** (on page 51) tab of the Settings (on page 36). |
| **Maximum number of database backup files** | Maximum number of backup files that are saved. Display only.<br>The path and number of backups are defined in the **Options** (on page 29) menu, in the **Database backups** (on page 51) tab of the Settings (on page 36). |
| **Button** | **Description** |
| **Previous** | Switches to previous tab. (Deactivated in the first tab) |
| **Next** | Switches to the next tab. (Deactivated in the last tab) |

| Option | Description |
|---|---|
| **OK** | Applies all changes in all tabs and closes the dialog.<br>The button is deactivated if one of the required input fields is empty or not configured correctly. |
| **Cancel** | Discards all changes in all tabs and closes the dialog. |

### 11.1.4.3 Databases

The databases to be backed up are selected in this tab.

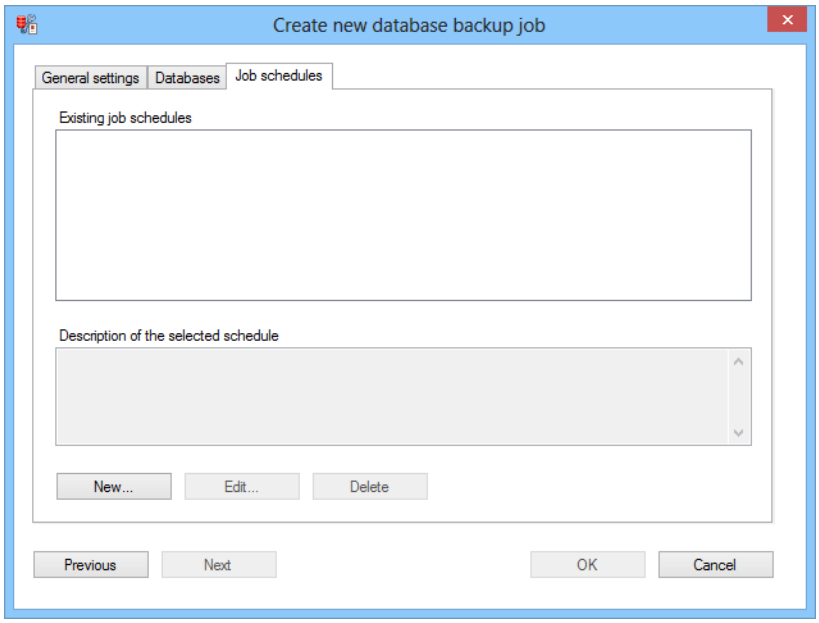



| Option | Description |
|---|---|
| **Available databases** | List of databases that can be selected for the backup job. Already-selected databases are no longer shown in this list. |
| **Buttons for assignment** | Buttons to drag databases between lists:<br>▸ >: Moves highlighted databases to the **Included databases list.**<br>▸ >>: Moves all databases to the **Included databases list.**<br>▸ <: Moves highlighted databases to the **Available databases** list.<br>▸ <<: Moves all databases to the **Available databases** list. |

| Option | Description |
|---|---|
| **Included databases** | List of databases that are backed up with this job. |
| **Button** | **Description** |
| **Previous** | Switches to previous tab. (Deactivated in the first tab) |
| **Next** | Switches to the next tab. (Deactivated in the last tab) |
| **OK** | Applies all changes in all tabs and closes the dialog.<br>The button is deactivated if one of the required input fields is empty or not configured correctly. |
| **Cancel** | Discards all changes in all tabs and closes the dialog. |

### 11.1.4.4 Job schedules

The rules for the schedules for the backup jobs are configured in this tab.

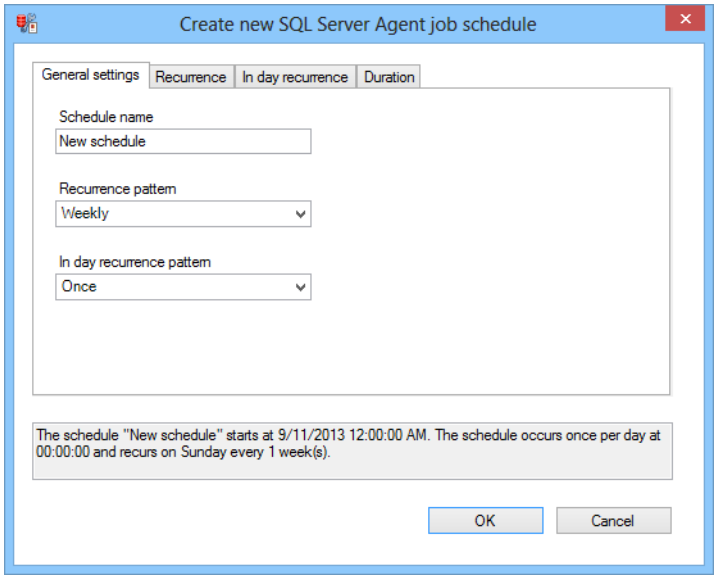



| Option | Description |
|---|---|
| **Existing job schedules** | Lists all schedules created for this job. |
| **Description of the selected schedule** | Shows details of the schedule selected in the **Existing job schedules** list. |
| **New** | Opens dialog to create a new schedule. |

| Option | Description |
|---|---|
| **Edit** | Opens dialog to edit the selected schedule. |
| **Delete** | Deletes the selected schedule. |
| **Button** | **Description** |
| **Previous** | Switches to previous tab. (Deactivated in the first tab) |
| **Next** | Switches to the next tab. (Deactivated in the last tab) |
| **OK** | Applies all changes in all tabs and closes the dialog.<br>The button is deactivated if one of the required input fields is empty or not configured correctly. |
| **Cancel** | Discards all changes in all tabs and closes the dialog. |

## CREATE NEW SCHEDULE OR EDIT SCHEDULE

Clicking on the 'New or edit' button opens the dialog to configure a schedule:



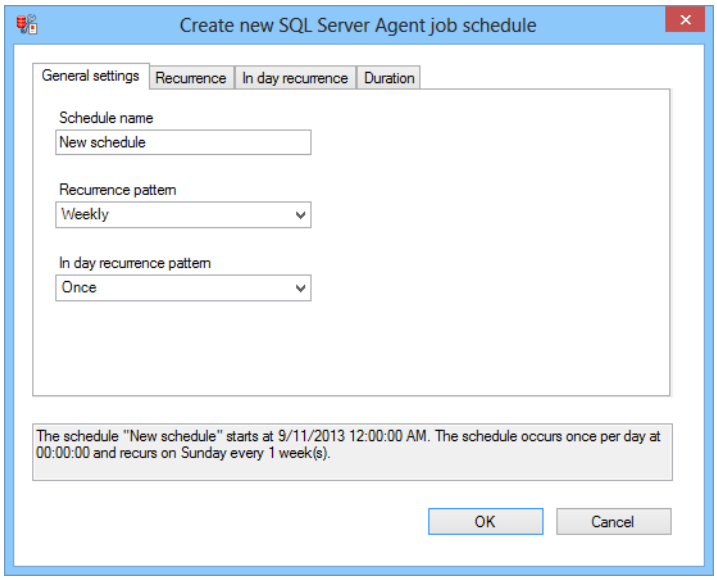

| Tabs | Description |
|---|---|
| **General settings** (on page 240) | General settings for the schedule. |
| **Recurrence** (on page 241) | Configuration of the recurrence for days. The controls available depend on the selection of the recurrence configuration in the **General settings** tab. |
| **In day recurrence** (on page 246) | Configuration of the recurrence within a day. The controls available depend on the selection of the recurrence pattern |

| Tabs | Description |
|---|---|
| | in the **General settings** tab. |
| **Duration** (on page 248) | Configuration of the time range in which the schedule is active |
| **OK** | Applies all changes in all tabs and closes the dialog. |
| **Cancel** | Discards all changes in all tabs and closes the dialog. |

**Note:** In ZAMS, only recurring schedules can be configured, because schedule types such as *Execute once*, *Always when the CPU is idle* or *Always when SQL server agent services are started* are not suitable for the execution of regular automated database backups.

### 11.1.4.4.1 General Settings

The sample for the recurrence of the backup job is saved in this tab.




| Option | Description |
|---|---|
| **Schedule name** | Entry of the name for the schedule. |
| **Recurrence configuration** | Selection of the recurrence configuration from drop-down list:<br>▸ *Daily*: The job is carried out at certain daily intervals.<br>▸ *Weekly*: The job is carried out on certain weekdays at certain weekly intervals.<br>▸ *Monthly, day of month*: The job is carried out on a |

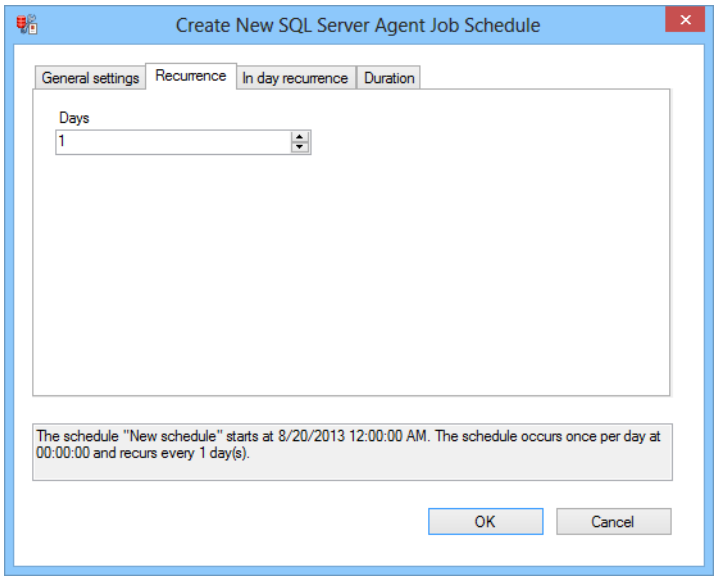
| Option | Description |
|---|---|
| | certain day at certain monthly intervals.<br>▸ *Monthly, day of week of month*: The job is carried out once a month with a certain monthly interval active, on a weekday in a certain week, for example every third month and then on Monday in the third week of this month.<br>**Note:** Details are configured in the respective **Recurrence** (on page 241) tab. |
| **In day recurrence pattern** | Selection of a recurring scheme for the day. This scheme determines how often and when the schedule triggers an event on active days. Select from drop-down list:<br>▸ *Once*: The schedule triggers an event at a precise point in time on active days, for example at 02:00:00. Details are configured in the In day recurrence (on page 246) tab.<br>▸ *Recurring*: On active days, the schedule triggers an event periodically with a certain interval, for example every 10 minutes from 02:00:00 to 05:00:00. Details are configured in the In day recurrence (on page 246) tab. |
| **Display of the configuration** | Displays the current configuration of the schedule. |
| **OK** | Applies all changes in all tabs and closes the dialog. |
| **Cancel** | Discards all changes in all tabs and closes the dialog. |

### 11.1.4.4.2 Recurrence

The recurrence configuration is configured in this tab. The options available depend on the configuration in the General settings (on page 240) tab. The following are available:

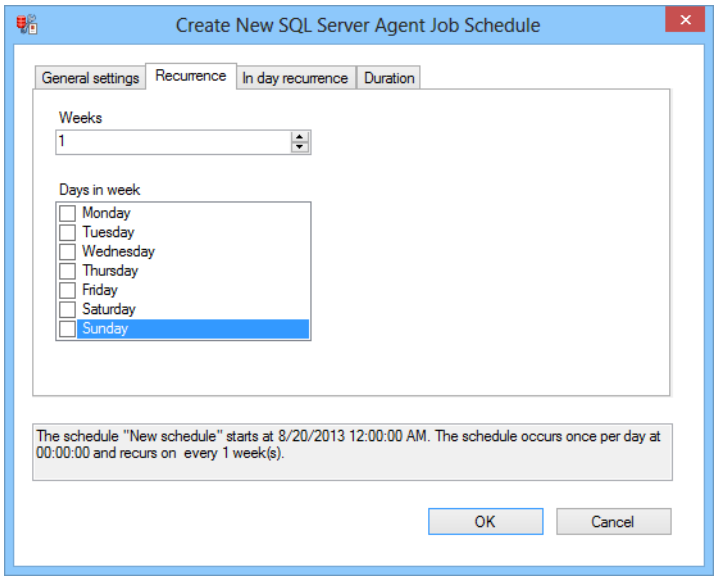
- *Daily*: The task is carried out at certain daily intervals.
- *Weekly*: The task is carried out on certain weekdays at certain weekly intervals.
- *Monthly, day of month*: The task is carried out on a certain day at certain monthly intervals.
- *Monthly, day of week of month*: The task is active once a month with a certain monthly interval, on a weekday in a certain week.

## "DAILY" CONFIGURATION



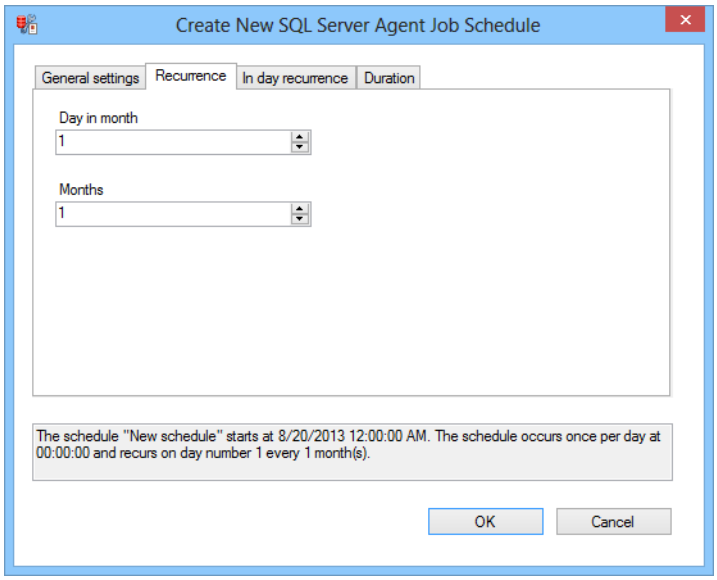

| Option | Description |
|---|---|
| **Days** | Configuration of the number of days that pass for a day with an active schedule. Manual entry or configuration using the arrow keys.<br>▸ Minimum: *1*<br>▸ Maximum: *99* |
| **Display of the configuration** | Displays the current configuration of the schedule. |
| **OK** | Applies all changes in all tabs and closes the dialog. |
| **Cancel** | Discards all changes in all tabs and closes the dialog. |

## "WEEKLY" CONFIGURATION



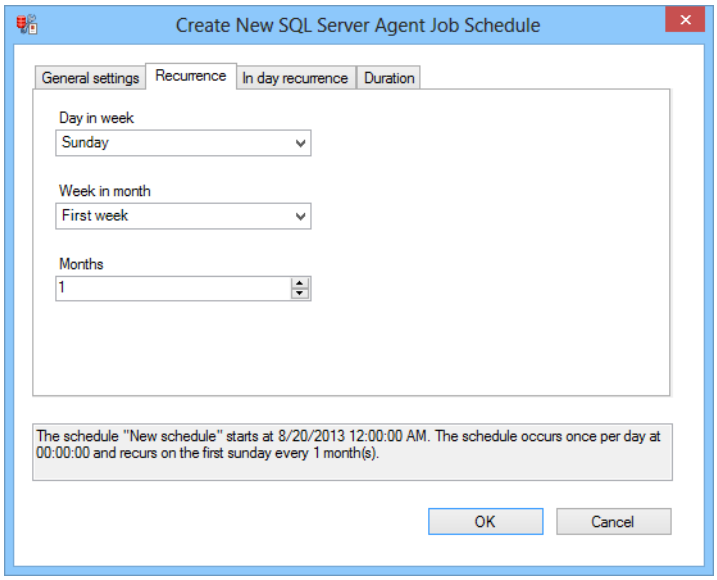

| Option | Description |
|---|---|
| **Weeks** | Configuration of the number of weeks of the selected weekdays that are active in the **Days in the week option**. Manual entry or configuration using the arrow keys:<br>▸ Minimum: *1*<br>▸ Maximum: *99* |
| **Days in week** | Selection of the weekdays on which the job is carried out. Selection by activating the checkbox. |
| **Display of the configuration** | Displays the current configuration of the schedule. |
| **OK** | Applies all changes in all tabs and closes the dialog. |
| **Cancel** | Discards all changes in all tabs and closes the dialog. |

## CONFIGURATION OF "MONTHLY, DAY OF MONTH"




| Option | Description |
|---|---|
| **Day in month** | Selection of the active days in the month. Manual entry or selection using the arrow keys:<br>▸ Minimum: *1*<br>▸ Maximum: *31* |
| **Months** | Selection of the monthly interval between active days. Manual entry or selection using the arrow keys:<br>▸ Minimum: *1*<br>▸ Maximum: *99* |
| **Display of the configuration** | Displays the current configuration of the schedule. |
| **OK** | Applies all changes in all tabs and closes the dialog. |
| **Cancel** | Discards all changes in all tabs and closes the dialog. |

## CONFIGURATION OF "MONTHLY, DAY OF WEEK IN THE MONTH"




| Option | Description |
|---|---|
| **Day in week** | Selection of the weekday on which the schedule is active, from a drop-down list:<br>▸ *monday*<br>▸ *tuesday*<br>▸ *Wednesday*<br>▸ *thursday*<br>▸ *friday*<br>▸ *saturday*<br>▸ *sunday*<br>▸ *Daily*<br>▸ *Weekday*<br>▸ *Weekend day* |
| **Week in month** | Selection of a week in the month in which the previously-selected day is active, from a drop-down list:<br>▸ First week<br>▸ Second week<br>▸ Third week<br>▸ Fourth week<br>▸ Last week |

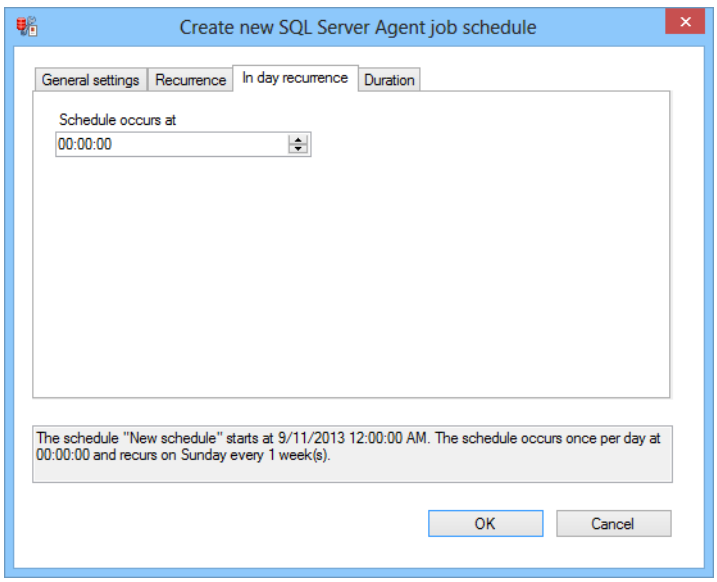
| Option | Description |
|---|---|
| **Months** | Selection of the monthly interval between active days. Manual entry or selection using the arrow keys:<br>▸ Minimum: *1*<br>▸ Maximum: *99* |
| **Display of the configuration** | Displays the current configuration of the schedule. |
| **OK** | Applies all changes in all tabs and closes the dialog. |
| **Cancel** | Discards all changes in all tabs and closes the dialog. |

### 11.1.4.4.3 In day recurrence

The recurrence for the day is configured in this tab. This scheme determines how often and when the schedule triggers an event on active days. The options available depend on the configuration in the General settings (on page 240) tab. The following are available:

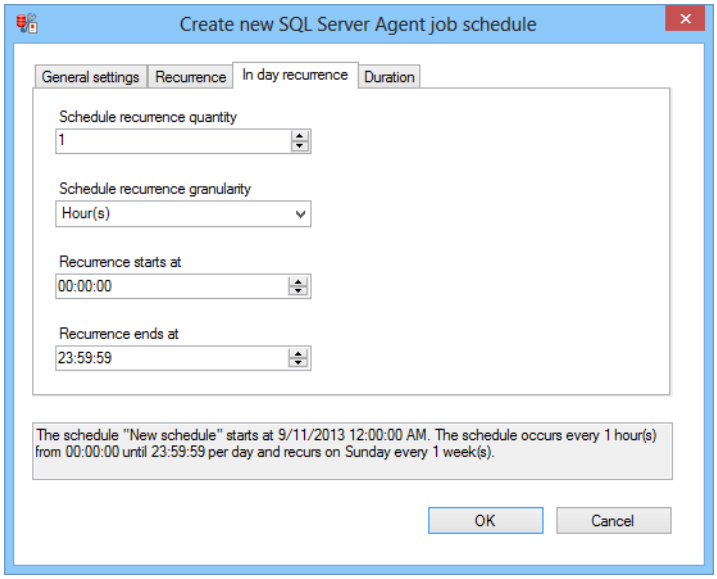
- *Once*: The schedule triggers an event at a precise point in time on active days.
- *Recurring*: The schedule triggers an event periodically in a certain time range with a certain interval on active days.

#### "ONCE" CONFIGURATION



| Option | Description |
|---|---|
| **Schedule occurs at** | Selection of the point in time when the schedule triggers an event on active days, in hours, minutes and seconds. Manual entry or selection using the arrow keys. |
| **Display of the configuration** | Displays the current configuration of the schedule. |
| **OK** | Applies all changes in all tabs and closes the dialog. |
| **Cancel** | Discards all changes in all tabs and closes the dialog. |

## "RECURRING" CONFIGURATION

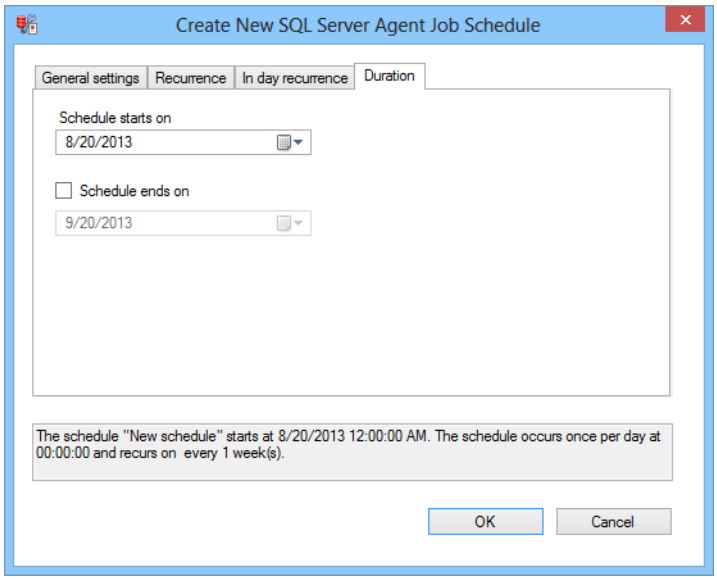



| Option | Description |
|---|---|
| **Schedule recurrence quantity** | Number of recurrences Manual entry or configuration using the cursor controls:<br>▸ Minimum: *1*<br>▸ Maximum: *99* |
| **Schedule recurrence granularity** | Schedule recurrence period granularity. Select from drop-down list:<br>▸ *Second(s)*<br>▸ *Minute(s)*<br>▸ *Hour(s)* |
| **Recurrence starts at** | Defines the start time of the activity period of the schedule on |

| Option | Description |
|---|---|
| | active days. Manual entry or configuration using the cursor controls. |
| **Recurrence ends at** | Defines the end time of the activity period of the schedule on active days. Manual entry or configuration using the cursor controls. |
| **Display of the configuration** | Displays the current configuration of the schedule. |
| **OK** | Applies all changes in all tabs and closes the dialog. |
| **Cancel** | Discards all changes in all tabs and closes the dialog. |

## 11.1.4.4.4 Duration

The period of validity of the schedule is configured in this tab.




| Option | Description |
|---|---|
| **Schedule starts on** | Configuration of the start of the validity for this schedule. Manual input or selection from a drop-down calendar.<br><br>Only days from this date can be active days.<br>For example: Start date April 1, 2014. The first backup job can be started on April 1 at 00:00:00. |
| **Schedule ends on** | *Active*: An expiration date is stipulated for this schedule. Manual input or selection from a drop-down calendar. |

| Option | Description |
|---|---|
| | Only days that are before this date can become active days. For example: End date May 1, 2014. The first backup job can be started on April 30 at 23:59:59.<br>The end date must be later than the start date. |
| **Display of the configuration** | Displays the current configuration of the schedule. |
| **OK** | Applies all changes in all tabs and closes the dialog. |
| **Cancel** | Discards all changes in all tabs and closes the dialog. |

### 11.1.4.5 Example of automated database backup

For an example of automated database backup, it is assumed that:

- An Analyzer server is put into operation on 1/1/2013.
  - The databases on the server are to be saved every Sunday at 20:00:00.
  - In doing so, there are no conflicts with subscriptions, because these are only started on Monday at 02:00:00.
  - The last 10 backup files should be retained for each database.
- On March 11, 2013, it is established that the server suffered hardware damage to the hard drive on 10 March, 2013, before the backups were made.
  - Once the drive has been replaced, the last backups before the hardware damage should be restored.
  - The backups made by the faulty hard drives are to be deleted.

The example consists of 3 stages:

1. Configuring automated backup
2. Deleting unusable backup files
3. Restoring correct backups

#### CONFIGURING AUTOMATIC BACKUP

1. The administration of automated database backups is started in ZAMS.
2. In this, the procedure to create a new automated database backup job is started.
3. All databases are included in the new job.

4. The schedule of the job is set so that the job is always carried out on Sunday at 02:00:00:
   - *Weekly*, with a weekly interval
   - Only **Sunday** active day
   - Execute once a day, at *02:00:00*
5. The new database backup job is carried out.

#### DELETING UNUSABLE FILES

1. The administration of database backup files is started in ZAMS.
2. The file list is sorted according to time stamps.
3. As a result, the backups created on March 10, 2013 are grouped together.
4. The backup files of March 10, 2013 are deleted.

### RESTORING BACKUPS

1. The procedure to restore database backups is started in ZAMS.
2. All databases are highlighted.
3. Because the most recent backup file is automatically selected, (from March 3, 2013, because the files from March 10, 2013 have been deleted), the restore can now be instigated by clicking on **OK**.

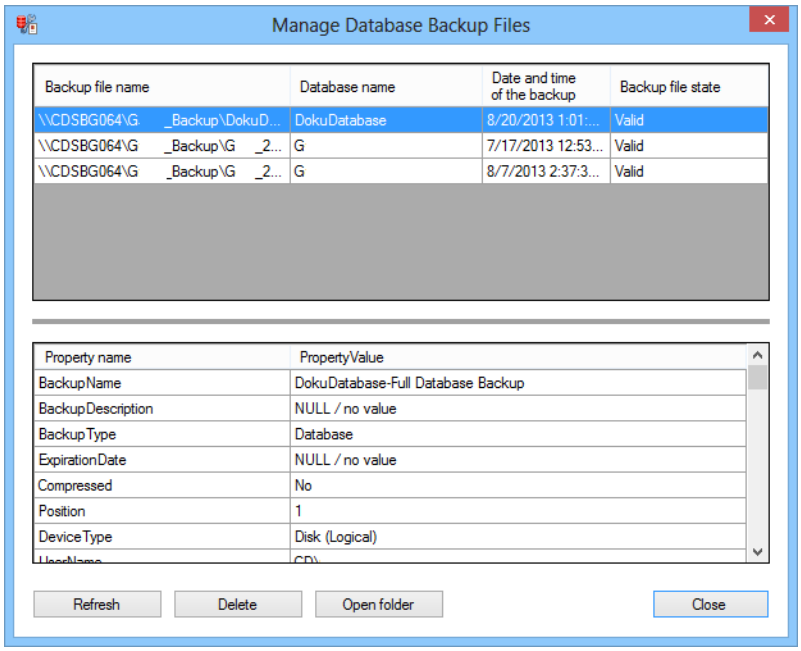
## 11.1.5 Manage database backup files

Automated and manually-created backups can be administered in their own dialog.

To administer database backups:

1. Open the **SQL-Server** ribbon.
2. Select the **Manage files** entry in the **Database backup** ribbon group.

The dialog for administering the backup files is opened.




| Option | Description |
|---|---|
| **Table of backup files** | Displays all backup files created with the following information:<br>▸ **Name of the backup file**: Filename in complete UNC format<br>▸ **Database name**: Name of the database to which the file belongs<br>▸ **Date and time of the backup**: Time stamp of the database backup that is in the file<br>▸ **Backup file state**: Status text of whether the checksum of the backup is valid. *Invalid* means a corrupted backup file.<br>One file can be selected. |
| **Separator** | Separates both tables and can be moved with the mouse in order to enlarge the display area of a table. |
| **Table of properties** | Shows details on the file that was selected in the upper table. The table contains names and values of the properties.<br>You can read details of these properties at:<br>http://msdn.microsoft.com/en-us/library/ms178536.aspx |

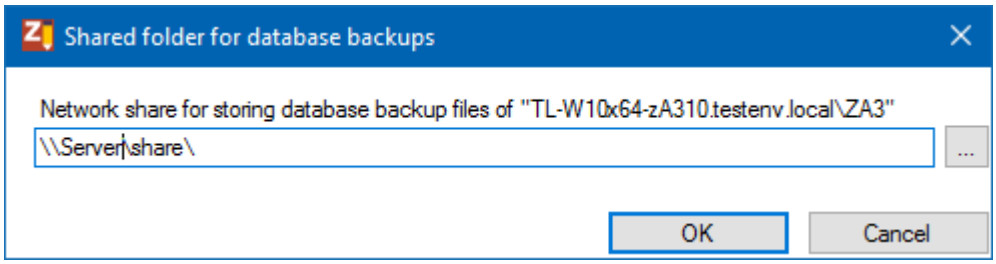
| Option | Description |
|---|---|
| | (http://msdn.microsoft.com/en-us/library/ms178536.aspx). |
| **Refresh** | Refreshes the display. |
| **Delete** | Deletes the selected file and updates the view. |
| **Open folder** | Opens the folder with the backup files in Windows Explorer. |
| **Close** | Closes the dialog. |

The size and position of the dialog can be changed. These settings are saved as user-dependent.

## STORAGE PATH FOR DATABASE BACKUP FILES:

The first time a backup request is made and a path has not yet been established, you are requested to define a save path. This path is then used for all backups and restorations. This path is administered in the options in the Database backups (on page 51) tab of the Settings (on page 36).

**Note:** It is recommended that a path on the Analyzer computer is used for backup.




| Option | Description |
|---|---|
| **Network share path for storing database backup files of [database]** | A valid UNC path must be entered.<br><br>Clicking on the **...** button opens the dialog (on page 347) to select a network share.<br><br>A check is made if:<br>▸ The syntax of the path is valid if: Only valid paths unlock the **OK** button.<br>▸ The path exists: When clicking on **OK**, the path is only accepted if it can also be accessed.<br>▸ The path is different to that already used: If a path is defined that is different to a path that has already been used, a corresponding message is given. The path can be created. The |

| Option | Description |
|---|---|
| | pre-existing database backup job can then be activated, deactivated and deleted, but can no longer be edited.<br><br>The configured path is saved individually for each user.<br><br>**Attention:** The access rights to network shares must be set correctly. For details, see the **Set access rights to network share correctly**. |
| **OK** | Accepts the path and closes the dialog. |
| **Cancel** | Discards changes and closes the dialog. |

### SET ACCESS RIGHTS TO NETWORK SHARE CORRECTLY

In order for all database backup or restore actions to run correctly, the access rights to the network share of the database backup folder must be correct. This path is administered in the settings (on page 36).
In doing so, the following applies:

- The folder must be on the Analyzer Server, because defined users must access it locally on the Analyzer Server.
- Because the folder must be accessible by both the Analyzer Server and the ZAMS computer with the same path, it must be authorized in the network. The folder is then accessible with the same path via a UNC path everywhere in the network.
- The following users must have full access to the network share:
  - **NT SERVICE\MSSQL$ZA3**: For the creation and restoration of backups.
    Defined **L**ocally on the Analyzer server. Virtual user, derived from the **SYSTEM**, in whose context the SQL Server instance is running.
  - **NT SERVICE\SQLAgent$ZA3**: For automatic creation of backups.
    Defined **L**ocally on the Analyzer server. Virtual user, derived from the **SYSTEM**, in whose context the SQL Server agent is running.
  - Every ZAMS user: To create and restore backups, administer backup files and administer automated backup jobs.

### BACKUP FILE NAME

The file name of a database backup file follows this scheme: **[database name]_yyyy_MM_dd_HH_mm_ss.bak**

e.g.: **ZA_DATA_2013_02_12_14_11_35.bak =** backup of **ZA_DATA** on *12.2.2013* at *14:11:35*

## 11.2 Enhanced backup: Databases and reports

Allows the individual selection of databases and reports for backing up and restoring.

**An enhanced backup consists of:**

- Reports from the server including its folder structure:
  This includes reports and settings for data sources and parameters.
- Analyzer databases
- Other databases, with the exception of SQL Server system databases and SQL Server Reporting Services databases

**Types of backup:**

- Reports: Only reports prepared on the server are backed up.
- Complete: All databases and reports can be selected.

The selection dialogs are structured in exactly the same way and offer the respective available objects.

**Note:** The access rights to network shares must be set correctly. For details, see the **Set access rights to network share correctly** section.

### 11.2.1 Saving

The objects that are in an enhanced backup depend on the type of backup and the selected objects. During creation, the user can select the objects that are backed up.

The following are precluded from backup in general:

- Linked Server
- Databases that have not been found
- Databases that have been deactivated for this backup by the user

**Note:** If a backup is only created with reports, then all databases are considered not found.

#### CREATE BACKUP

To back up reports and/or databases:

1. In the **SQL Server** ribbon, click on **Create** in the **Enhanced Backup** area.

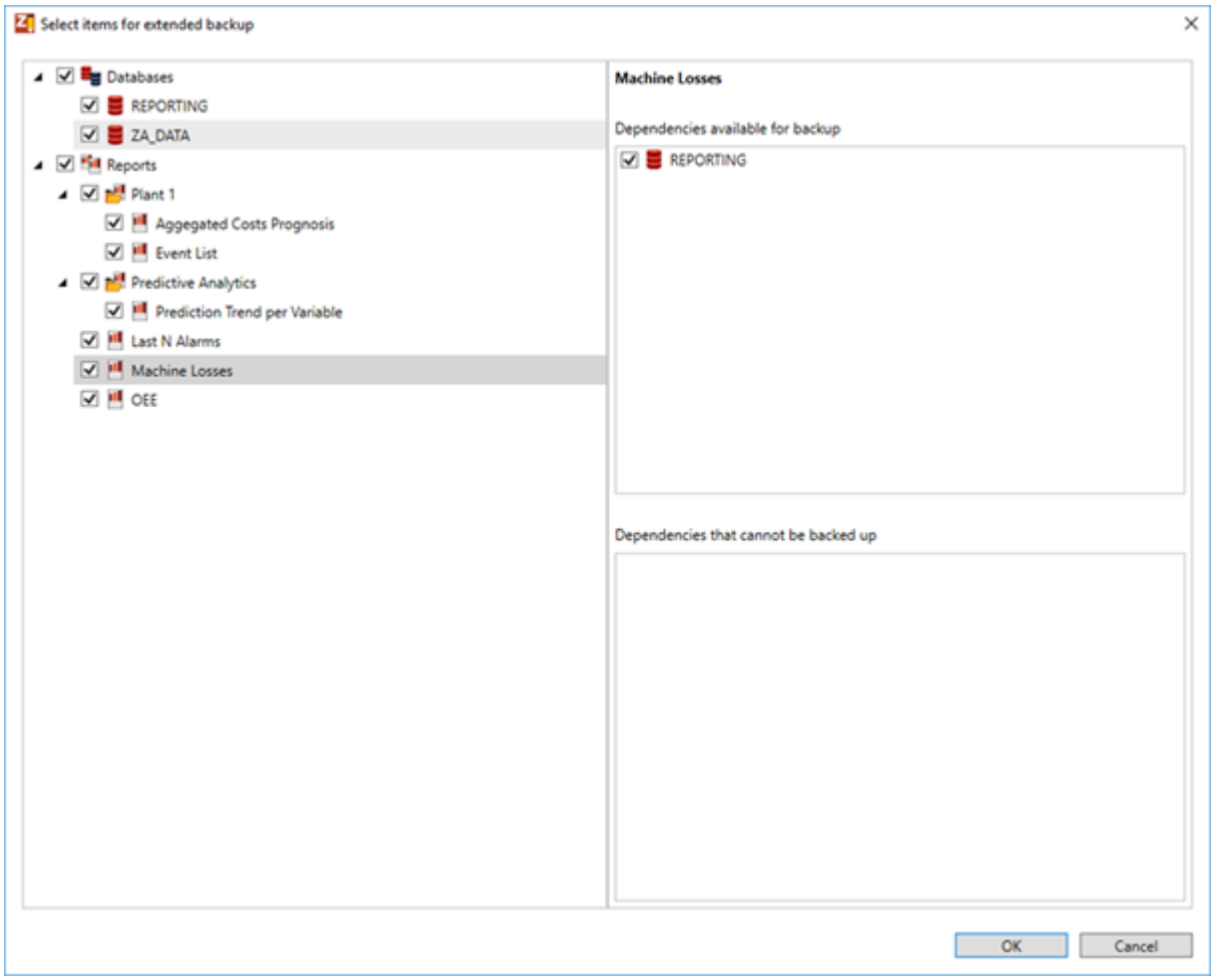
2. Select the backup type:
   - *Reports*
   - *Complete*

   The dialog to create a backup is opened.
3. Select the desired objects by means of the checkboxes.
4. Note the information in the right area of the dialog.
   Here you are shown which dependent objects are also backed up and which dependent objects are not backed up.
5. Click on **OK**.

   The dialog to select a save location is opened.
6. Select the save location and give a name to the backup file.
   Suffix of the backup file:
   - Complete backup: ***.cbu**
   - Report backup: ***.rbu**

   Click on **OK**.
7. The backup file is saved.

## ENHANCED BACKUP DIALOG




| Options | Description |
|---|---|
| **Available objects** | Display of the objects that have been found.<br><br>They are divided into:<br><br>▸ Databases: Only present if *complete* has been selected as a backup type and at least one database can be included in the backup.<br><br>▸ Reports: Only present if at least one report can be included in the backup.<br>Folder and report storage structure of the Analyzer server are displayed below this node. In doing so, all folders are sorted at the top alphabetically according to name at each level and then the reports are displayed alphabetically.<br><br>The following is displayed for each object: |

| Options | Description |
|---|---|
| | ▸ Checkbox for snapshot in the backup: Clicking changes status. The symbol is thus also changed. Dependent objects are updated.<br>▸ Symbol to display type and dependency status.<br>▸ Name of the object. |
| **Available dependencies** | An object must be selected in the **Available Objects** area in order to display content.<br>Display:<br>▸ Name of the object.<br>▸ List with databases that can be included in the backup. They can also still be included in the backup or excluded from it. |
| **Non-savable dependencies** | List of the databases and linked server that are not included in the backup. Display only. No changes are possible. |

**Symbols:**

- Root node databases
- Analyzer database: All dependencies are included in the backup.
- Analyzer database: Not all dependencies included in the backup.
- Database that is not an Analyzer database.
- Reports node.
- Report folder.
- Report: All dependencies are included in the backup.
- Report: Not all dependencies are included in the backup.

## 11.2.2 Restore

When restoring, there is an automatic decision about which objects are restored. Selection by the user is not possible.

The following are restored:

- With complete backups:
  - Non-Analyzer databases, new and/or overwriting.

- Analyzer databases, new and/or overwriting.
  In doing so, user access rights are synchronized. Deactivated archive emulation jobs are created if necessary.
  The necessary data source objects are created on the report server for new databases.
- Reports

- Reports:
  The following are noted in the process:
  a) If necessary: Creation of the folder path on the report server.
  b) Creation/overwriting of the reports on the report server.
  c) Setting of the description of the report if creation/overwriting was successful.
  d) Setting of the data source of the report if creation/overwriting was successful.
  e) Setting of the parameter of the report if creation/overwriting was successful.

## RESTORE BACKUP

To restore reports and/or databases:

1. In the **SQL Server** ribbon, click on **Restore** in the **Enhanced Backup** area.
2. Select the restore type:
   - *Reports*
   - *Complete*

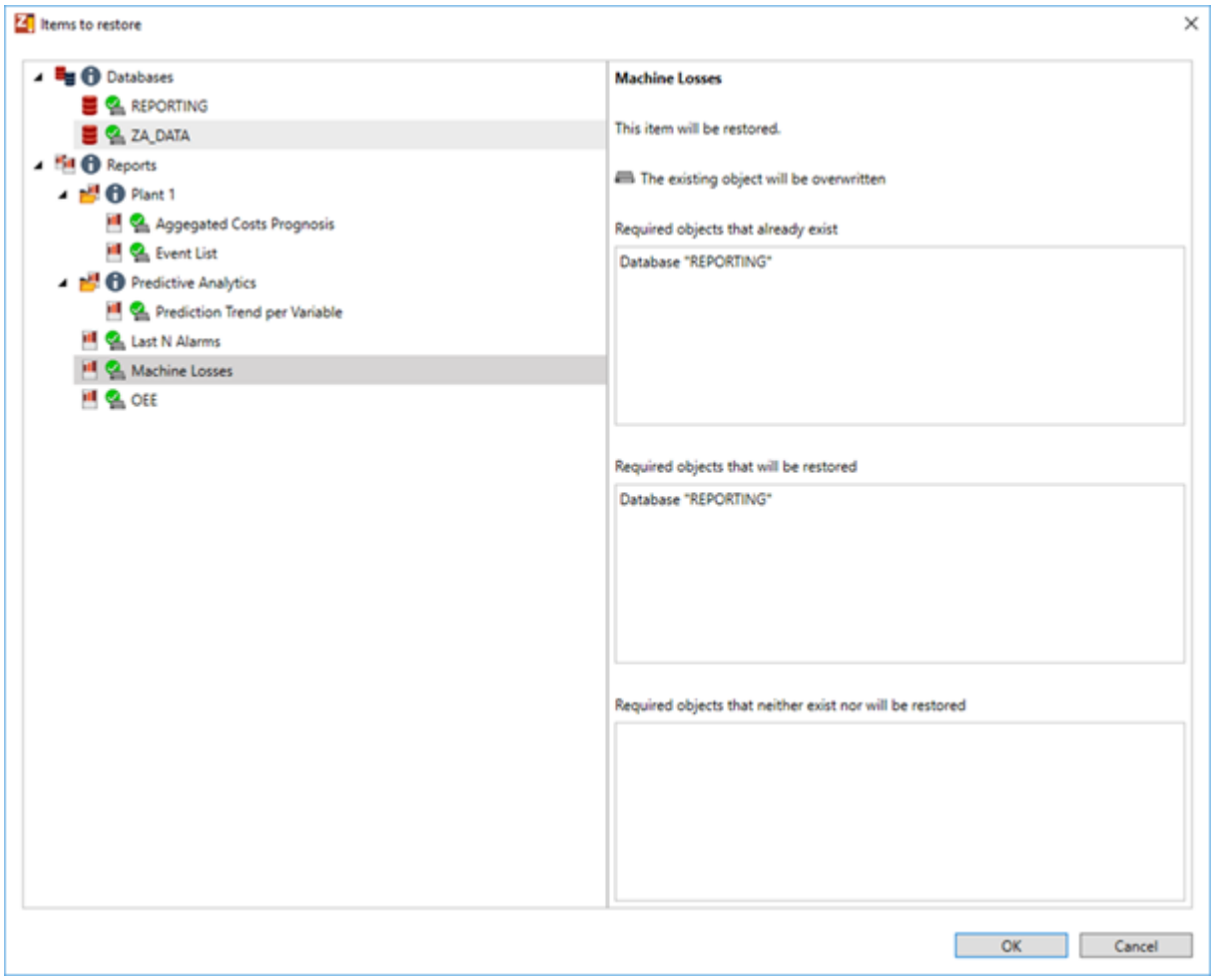
   The dialog to select the backup file to be restored is opened.
3. Select the file to be opened.
   Backup file suffix:
   - Complete backup: ***.cbu**
   - Report backup: ***.rbu**

   Click on **OK**.

   The dialog to restore a backup is opened. Databases and reports that can be restored are displayed. Individual selection is not possible.
4. Click on **OK**.

   The databases and reports are restored from the backup file.

## RESTORE BACKUP FILE DIALOG




| Option | Description |
|---|---|
| **Available objects** | Display of the objects that have been found.<br><br>They are divided into:<br><br>▸ Databases: Only present if at least one database is present in the backup.<br><br>▸ Reports: Only present if at least one report is present in the backup.<br>Folder and report storage structure of the Analyzer server are displayed below this node. In doing so, all folders are sorted at the top alphabetically according to name at each level and then the reports are displayed alphabetically.<br><br>The following is displayed for each object: |

| Option | Description |
|---|---|
| | ▸ Symbol to display type and dependency status.<br>▸ Symbol for action when restoring.<br>▸ Name of the object. |
| **Dependencies** | An object must be selected in the **Available Objects** area in order to display content, with the exception of root nodes.<br>Display:<br>▸ Name of the object.<br>▸ Text information about the action when when restoring. If an existing object is overwritten, a corresponding warning is displayed. |
| **Required existing objects** | Display of the dependent objects that are already present. |
| **Required objects that can be restored** | Display of the dependent objects that do not exist on the Analyzer SQL Server instance but are are created when restoring. |
| **Required objects that neither exist nor can be restored** | Display of the dependent objects that are neither present nor can be created. |

**Symbols:**

- No action because not possible or not necessary.
- Restoring as a new object.
- Restore, existing object is overwritten.
- Cannot be restored.
- Restoring as a new object despite dependencies that cannot be removed.
  This may be successful for databases.
- Restoring despite dependencies that cannot be removed, existing object is overwritten.
  This may be successful for databases.

# 12 Report styles

Report styles give you the possibility to configure graphical elements individually and to assign reports. Report styles are constructed in a modular fashion and are defined centrally. They allow the central configuration of fonts, lines, frames, colors, color gradients and markers.

zenon Analyzer is supplied with the **Analyzer Initial** report style as standard. This is pre-defined and initially assigned to all reports. A many individual styles as desired can also be created and assigned. Assignment of individual reports can be:

- In general for all newly-created reports
- Targeted, for individual, existing reports

Report styles can be exported and imported via XML.

### Attention

Please note the following when applying styles:

- When drawing markings in diagrams, the frame style of the markings is ignored by the SQL Server Reporting Services.
- With the trend line and border style, a line style is always only applied between 2 neighboring points. If the points are too close to one another, this can create the impression of a solid line. The correct style is always applied for keys, however

## REPORT STYLES

There are two types of report styles available:

- COPA-DATA Standard
- individually-created report style

### COPA-DATA STANDARD

The **Analyzer Initial** report style is supplied as standard.
This:

- Is defined as fixed and cannot be changed.
- Cannot be exported.
- Cannot be overwritten by imported files.
- Cannot be deleted
- Is initially assigned to all reports
- Is automatically assigned if an individually-created report style is no longer available

#### INDIVIDUAL REPORT STYLES

ZAMS users can do the following with individual report styles:

- Create and edit (on page 265)
- export (on page 271)
- import (on page 268)
- delete (on page 262)
- Assign all newly-created or individual reports

## 12.1 Administering and assigning report styles

You can do the following with report styles:

- create (on page 265)
- edit (on page 265)
- Assign
- delete
- export (on page 271) and import (on page 268)
- Copy

### ASSIGN REPORT STYLES

Report styles can generally be assigned to all newly-created reports or individual reports.

#### INITIAL REPORT STYLE

To assign a report style to all new report templates:

1. Open the **Options** ribbon
2. Click on the **Report styles** entry.

   The dialog for administering (on page 264) the report styles is opened.
3. Select the desired style from the list by clicking in the radio button.
4. Confirm your selection by clicking on the **OK** button

This report style is assigned automatically:

- All newly-created report templates
- All report templates that do not have a style

### ASSIGN REPORT STYLE INDIVIDUALLY

To assign a report style to a certain report template:

Open the report template in ZAMS. Display the properties for the report settings.
To do this, for example, click on a free area in a free area of the design area.

1. Go to the **Report style** property.
2. Select the desired report style from the drop-down list.
3. Save the report template.

**Note:** If the linked report style is deleted, the report template is automatically assigned to the **Analyzer Initial** style.

## DELETE REPORT STYLE

To delete a report style:

1. Select the report style in the **Manage report styles dialog** (on page 264).
2. Click on the symbol to be deleted (X).

   A symbol with a green tick is shown, as confirmation of deletion.
3. Click on the deletion confirmation.

   The report style is deleted.
   If it is still linked to report templates, the **Analyzer Initial** style is linked in these report templates.

## COPY REPORT STYLE

Report styles cannot be copied directly. You can however create a copy by exporting and importing a style.

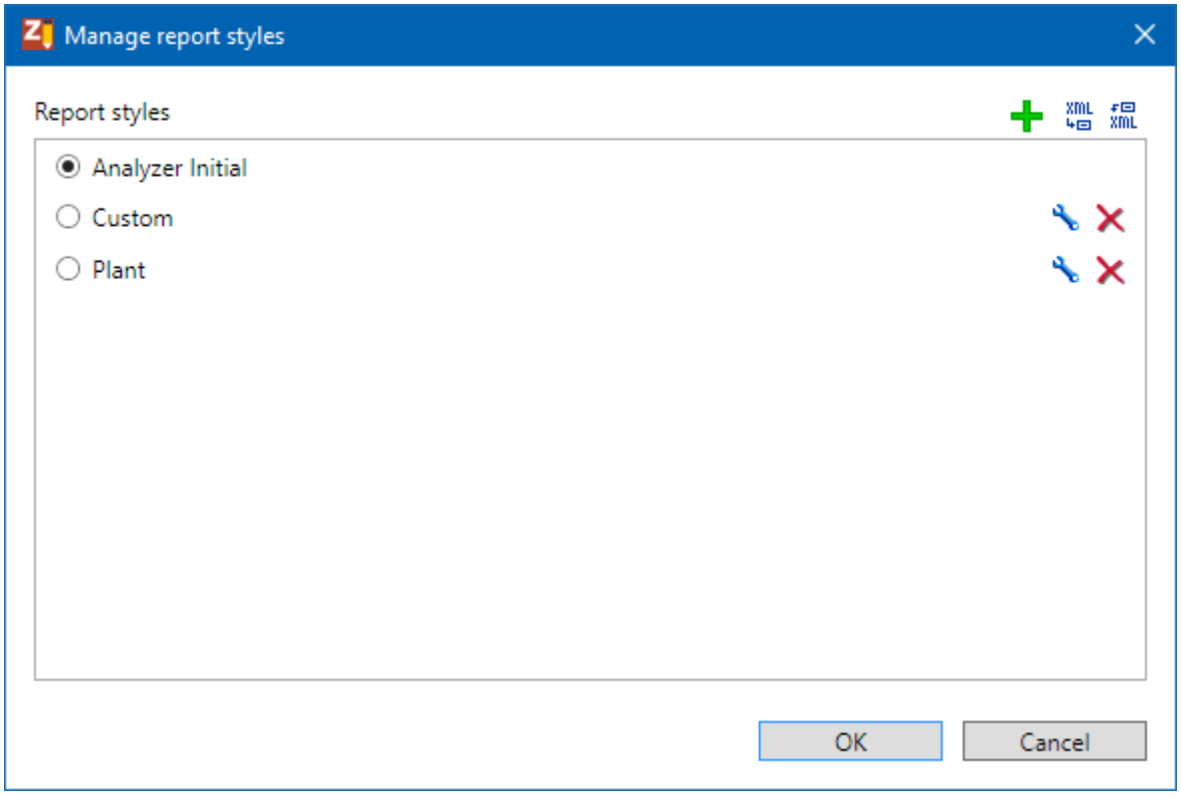
To copy a report style:

1. Export the template to an XML file.
2. import the XML file.
3. A conflict is displayed during import
4. For **problem handling in the event of a conflict**, select: *Rename imported style*.
5. Give it a new name.
6. Click on OK.

   The imported template is created with the previous settings under new names.

## 12.1.1 Dialog - Manage report styles

With this dialog, you manage report styles and generally assign them reports.




| Option | Description |
|---|---|
| **List of report styles** | List of available report styles. The **Analyzer Initial** style is always present. It can neither be changed, exported or deleted.<br><br>All other styles can be edited. There are two symbols available for this:<br><br>▸ **Edit** (wrench symbol):<br>Opens the dialog to edit (on page 265) the report style.<br><br>▸ **Delete** (X symbol):<br>Deletes the selected report style from the list. Deletion must be confirmed with a further click on the symbol with the green tick.<br>If the deleted report style is used by a report, it is automatically assigned to the **Analyzer Initial** report style. |
| **Plus sign** | Opens the dialog to create (on page 265) a new report |

| Option | Description |
|---|---|
| | style. |
| **XML import** | Opens the dialog to import (on page 268) a report style into an XML file. |
| **XML export** | Opens the dialog to export (on page 271) a report style into an XML file. |

### CLOSE DIALOG

| Option | Description |
|---|---|
| **OK** | Applies settings and closes the dialog. |
| **Cancel** | Discards all changes and closes the dialog. |

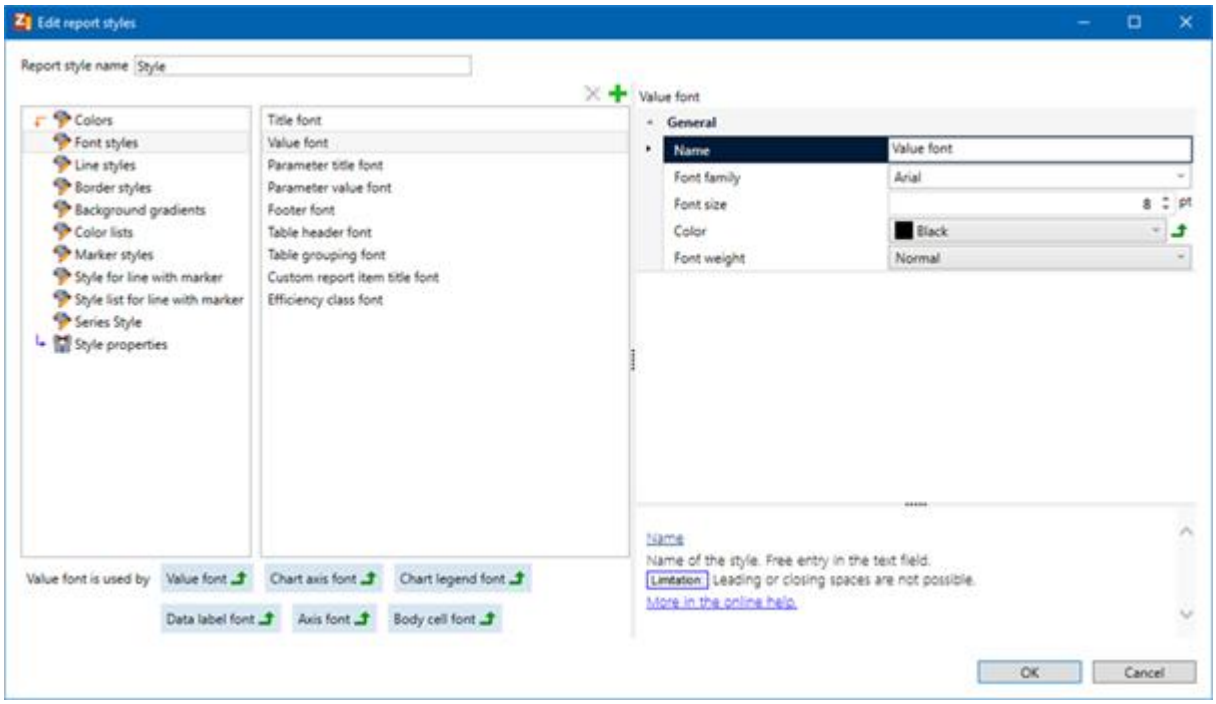
## 12.2 Creating and editing report styles

Report styles can be created and edited individually. Properties, styles and style groups are edited during configuration.
The following is applicable for styles and properties:

- A property can be used in several styles.
- A style can be used in properties as a value.

## DIALOG FOR CONFIGURATION OF REPORT STYLES

The dialog for the configuration of report styles is subdivided into several sections:




| Position | Item | Description |
|---|---|---|
| **Top left** | **Report style name** | Entry of the name for the report style.<br>The Name<br>▸ must be unique<br>▸ Must not contain any leading or closing spaces. |
| **Outside left** | List of the style groups | Lists all available style groups. Each style group contains at least one style.<br>Arrows point to style groups that are dependent on one another:<br>▸ **Red arrow**: The selected style group uses elements of this style group.<br>▸ **Blue arrow**: Elements of the selected style group are used in this style group. |
| **Center** | List of the styles for the selected style group | Lists all styles of a style group. These are configured using properties. |

| Position | Item | Description |
|---|---|---|
| **Outside right** | Properties for the selected style | The properties specify a style.<br><br>Properties can contain styles.<br>For example, a color is defined using the corresponding style in the colors style group.<br><br>Properties that use use styles refer to the respective style with a green arrow. Clicking on the arrow switches to the corresponding style. |
| **Bottom center** | Display of the properties that use the selected style | Shows all properties that use the selected style.<br><br>Clicking on an element switches to the corresponding property. |
| **Bottom right** | Embedded Help | Shows a brief help text for the selected property and a link to the manual. |
| **Bottom right** | **OK** | Clicking on the button accepts the configuration and closes the dialog. |
| **Bottom right** | **Cancel** | Ends configuration and discards changes.<br><br>**Note:** On new creation, the report style is also created and entered into the list on canceling. Its configuration corresponds to the **Analyzer Initial** style. |

## DEPENDENCIES AND LINKINGS

Styles are defined by properties. Properties can use styles. The interrelationships are shown by arrows and links.

For example **Analyzer Initial**:

- The **font style** style group contains the **font for value fields** style.
- This style consists of the properties **Name**, **Font family**, **Font size**, **Color** and **Font weight**.
- The **Color** *Black* property is defined in the **Colors** (on page 275) style group in the **Black** style.
- The **font for value fields** style is used in the following properties: **Font for value fields**, **graphics axis font**, **key font**, **font data description**, **axis font** and **data cell font**.

## CREATE REPORT STYLE

To create a new report style:

1. In the **Options** ribbon, click on **report styles**.

   The dialog for administering report styles is opened.
2. Click on the symbol to add a new report style (green plus sign).

   The dialog for configuration is opened.
3. Please enter a unique name.
4. Configure the desired style.
   **Note:** When first called up, the new report style has the settings of the **Analyzer Initial** report style.
5. End configuration by clicking on **OK**.
6. Close the dialog for administering report styles by clicking on **OK**.

### EDIT REPORT STYLE

To edit a report style:

1. Open the dialog **Manage report styles**.
2. Select the desired style in the **Report styles** list.
3. Click on the symbol to edit (wrench):

   The dialog to configure a report style is opened.

### RENAME REPORT STYLE

To rename a report style:

1. Open the dialog **Manage report styles**.
2. Select the desired style in the **Report styles** list.
3. Click on the symbol to edit**.**

   The dialog for defining a report style is opened.
4. Change the name in the **Name for report style** option.
5. Confirm the change by clicking on the **OK** button.
6. Close the dialog for administering report styles by clicking on **OK**.

## 12.3 Import report styles

Report styles can be imported from an XML file.
To import a report style:

1. Activate the **Options** ribbon.

2. Click on **Report styles**.

   The dialog to manage (on page 264) the report styles is opened.

3. click on the symbol for **XML import**.

   The dialog to select an XML file is opened.
   This dialog is always displayed in the language of the operating system.

4. Select the save location and the desired XML file.

5. Click on **OK.**

6. The dialog for the import is opened.

   All importable report styles included in the XML file are offered for import.
   If a name that has already been issued is to be imported, a validation error is shown and the dialog cannot be confirmed.
   If there are conflicts with existing report styles, these are shown.
   In the event of conflicts, you decide whether the report style to be imported:

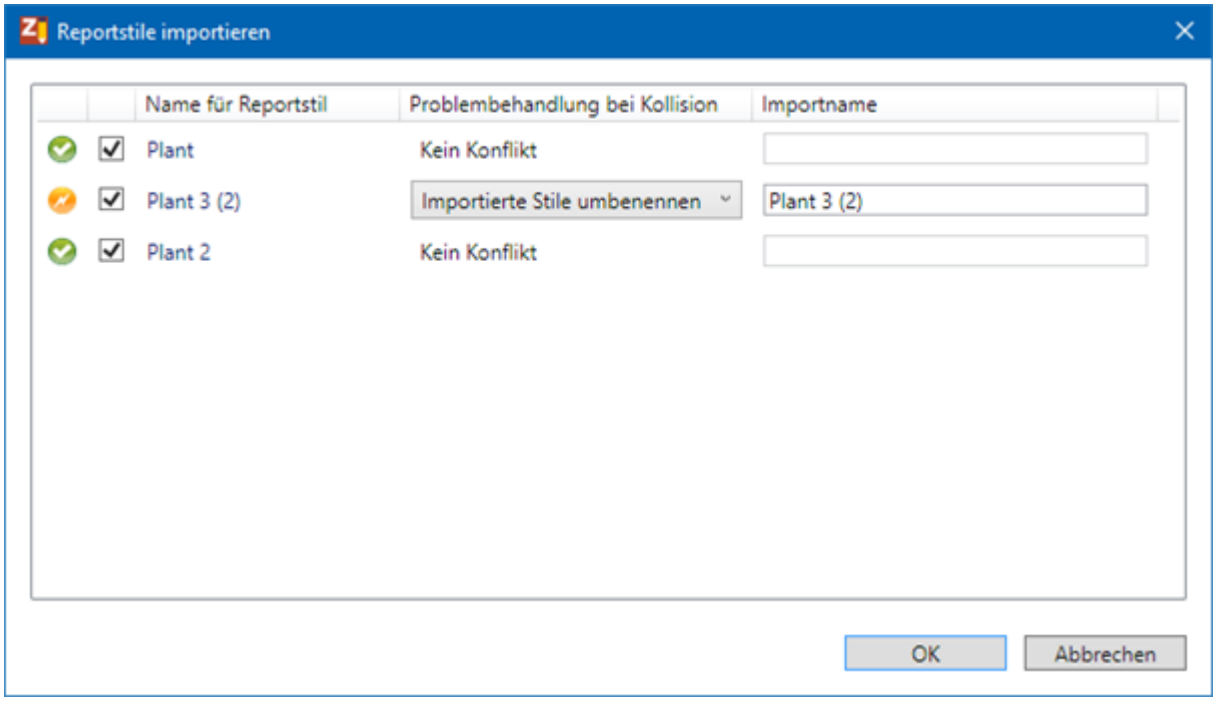
   - Overwrites an existing one
   - Is created under a new name
   - Is not imported

7. Click on **OK**.

   The selected report styles are imported.

## IMPORT REPORT STYLE DIALOG

When importing an XML file with report styles, all the report styles contained therein are displayed in a dialog.




| Option | Description |
|---|---|
| **List of report styles** | Lists all existing individually-created report styles. These can be selected by clicking on the checkbox for import. |
| **Symbol** | Shows whether a report style with this name already exists. |
| **Report style name** | Name of the report style to be imported. Clicking in the checkbox highlights the report style for import. |
| **Collision resolve type** | If there is already a report style with the same name, two options to resolve the conflict are offered.<br>Select from drop-down list:<br>▸ *Rename imported style*:<br>Imports the style under a new name. The new name must be entered in the **Import name** column.<br>▸ *Overwrite existing style*: Imports the style and overwrites the existing one in the process.<br>Default: *Rename imported styles* |
| **Import name** | Name for the report style to be imported. Only available if there are no conflicts. Clicking in the field allows the editing of the proposed |

| Option | Description |
|---|---|
| | default name.<br><br>Default: *[existing name] [serial number]* |
| **OK** | Accepts selection, closes this dialog and imports the selected report style. |
| **Cancel** | Cancels the import and closes the dialog. |

## 12.4 Export report styles

Report styles can be exported to an XML file.
To export a report style:

1. Activate the **Options** ribbon.
2. Click on **Report styles**.

   The dialog to manage (on page 264) the report styles is opened.
3. Click on the symbol for the **XML export**.

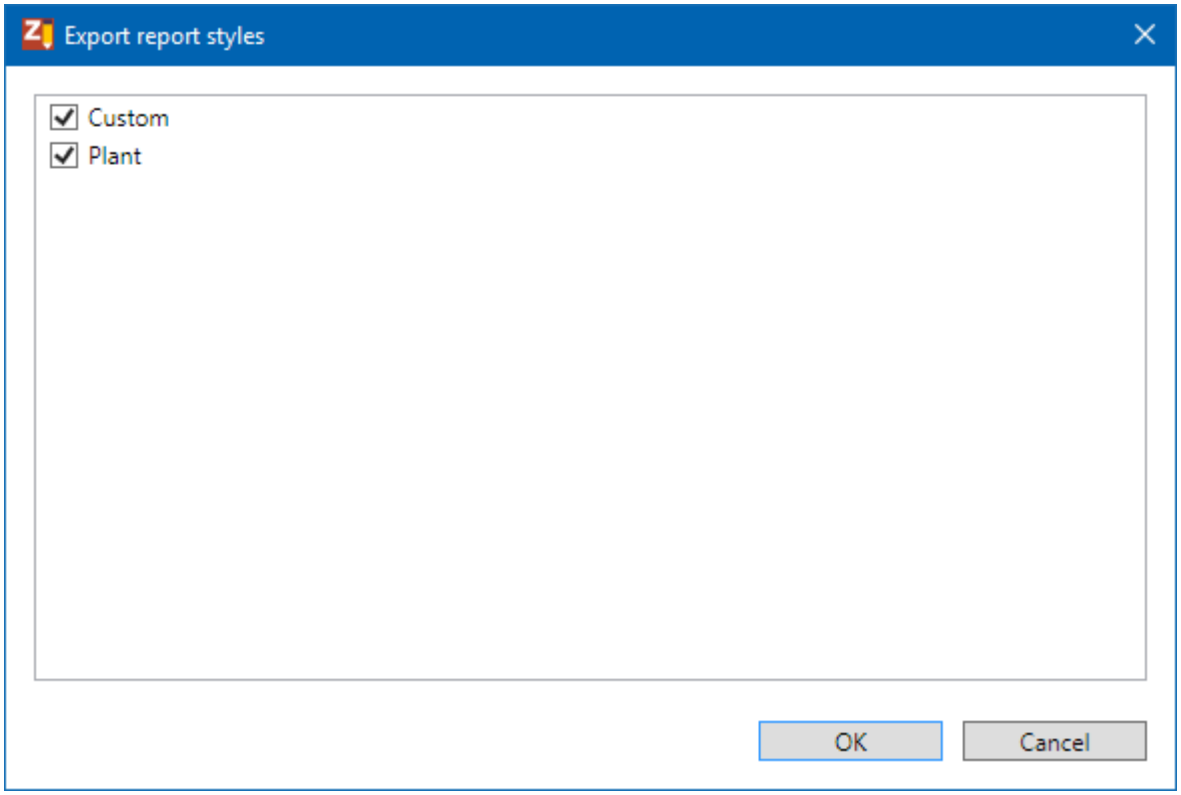
   The dialog for selecting a report style is opened
4. Select the desired report style by clicking on the checkbox.
5. Click on **OK**.

   The dialog to select a save location is opened.
   This dialog is always shown in the language of the operating system.
6. Select the save location and enter a file name.
7. Click on **OK**.

   The selected report styles are saved as an XML file.

## DIALOG TO SELECT THE REPORT STYLE

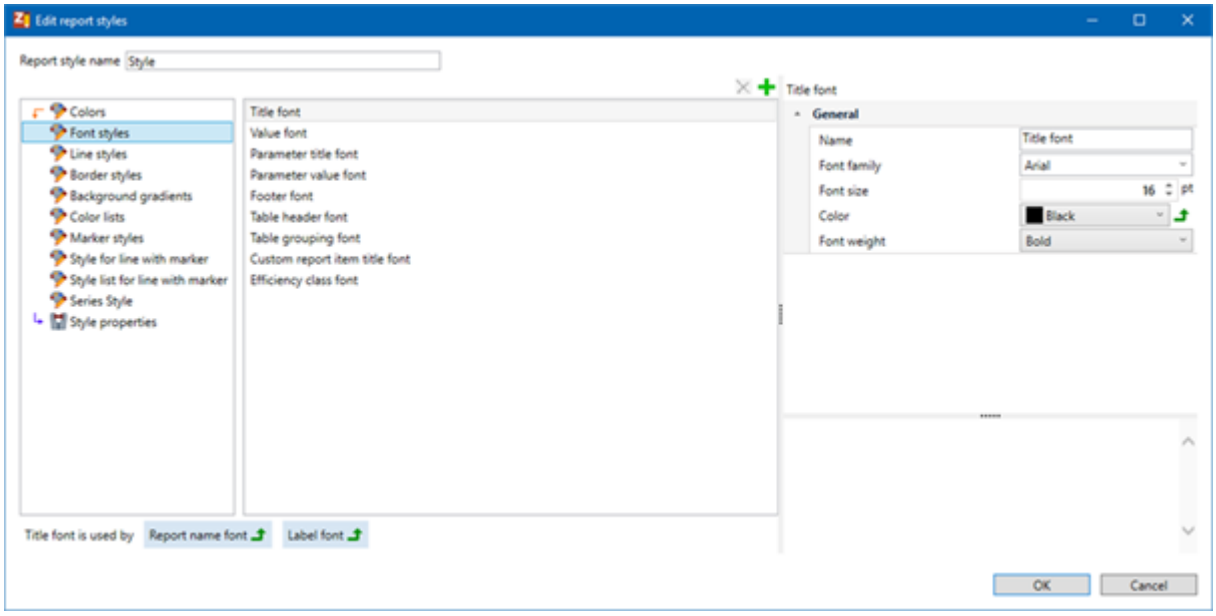
All individually-configured styles are offered for the export of the report styles. The style **Analyzer Initial** cannot be exported.




| Option | Description |
|---|---|
| **List of report styles** | Lists all existing individually-created report styles. These can be selected by clicking on the checkbox for export. |
| **OK** | Accepts selection, closes the dialog and opens the dialog to select a save location for the export file.<br>Only available if at least one report style has been selected. |
| **Cancel** | Cancels the export and closes dialog. |

## 12.5 Style groups and styles

Report styles are organized in style groups and styles. Each style group contains at least one style. Styles can be edited and newly added. The list entries are sorted in such a way that the basic modules are at the top. The colors are therefore at the first place and the style properties that use all other styles are at the lowest place.




The following are available as style groups:

- **Colors** (on page 275)
- **Font styles** (on page 278)
- **Line styles** (on page 281)
- **Border styles** (on page 284)
- **Background gradients** (on page 287)
- **Color lists** (on page 288)
- **Marker styles** (on page 290)
- **Style for line with marker** (on page 292)
- **Style list for line with marker** (on page 294)
- **Series Style**
- **Style properties** (on page 297)

### ADD STYLE

To add a new style to a style group:

1. Click on the symbol to add (green cross).

A new style with the default values is created.

2. Configure the property of the new style.
3. Close the dialog by clicking on **OK**.

## DELETE STYLE

To delete a style:

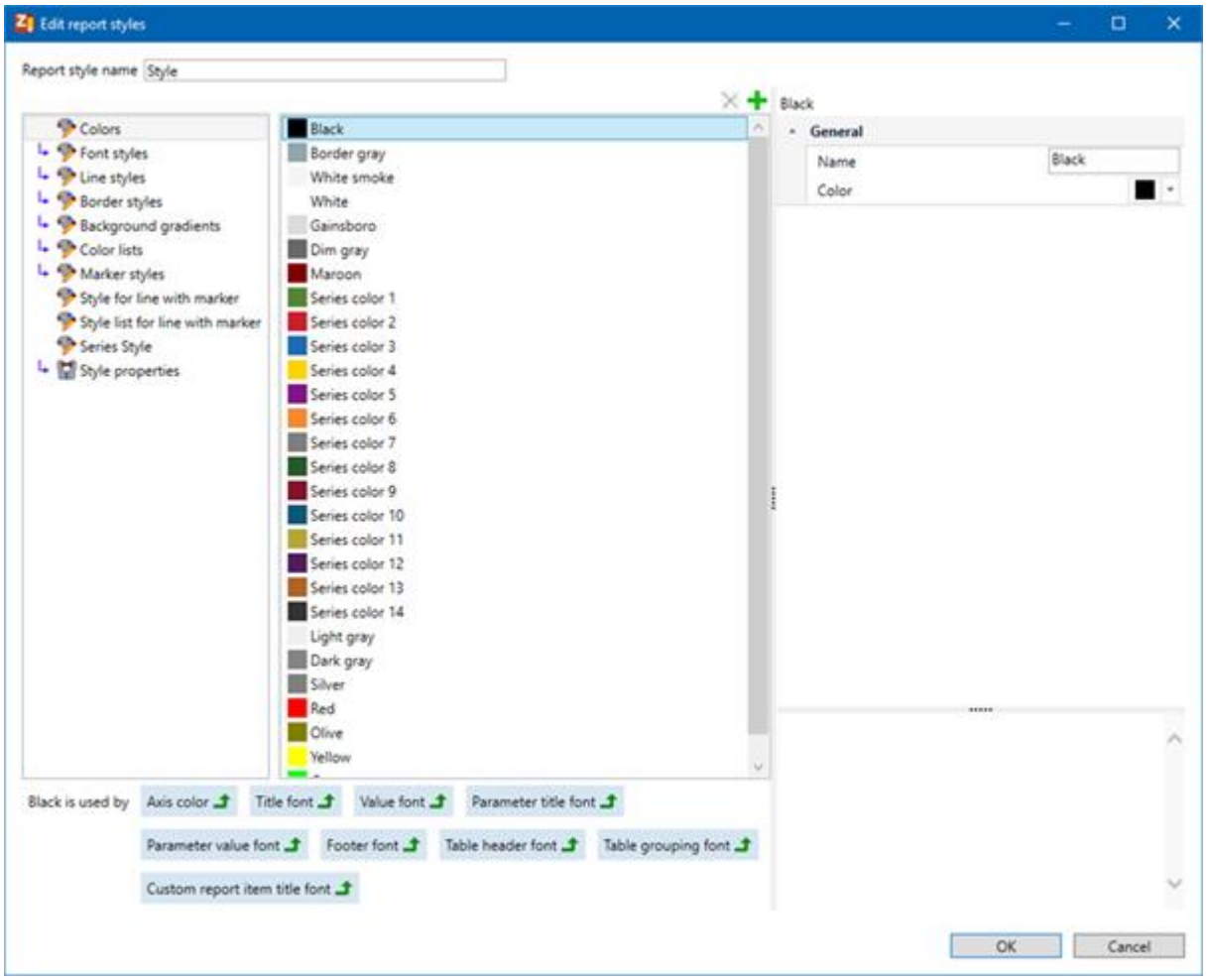
1. Select the style.
2. Click on the symbol to be removed (red cross).

   The style is removed from the list without a request for confirmation.

**Note:** Styles can only be deleted if they are not used at another place.

## 12.5.1 Colors

This style group defines the value for colors. The colors stipulated here are used by all further elements. In doing so, they are identified using the **Name** property.




There are pre-defined colors available. These can be amended and enhanced as desired.

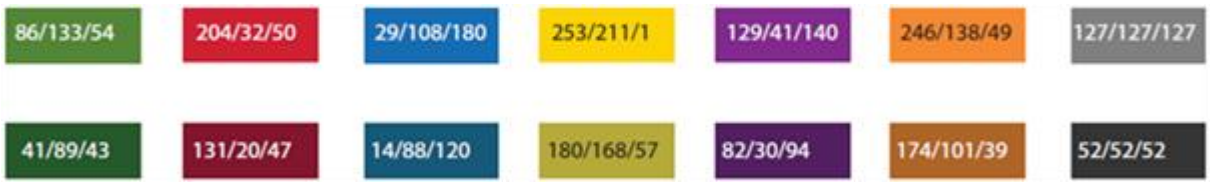
**Pre-defined colors:**

- *Black*
- *Border gray*
- *White smoke*
- *White*
- *Gainsboro*
- *Dim gray*
- *Maroon*
- *Series color 1*

- *Series color 2*
- *Series color 3*
- *Series color 4*
- *Series color 5*
- *Series color 6*
- *Series color 7*
- *Series color 8*
- *Series color 9*
- *Series color 10*
- *Series color 11*
- *Series color 12*
- *Series color 13*
- *Series color 14*
- *Light gray*
- *Dark grey*
- *Silver*
- *Red*
- *Olive*
- *Yellow*
- *Green*

## COLOR VALUES FOR SERIES COLORS

Color definition of the series colors in RGB.




| Series color # | Color | RGB Decimal | HEX |
|---|---|---|---|
| *1* | *light green* | *86 / 133 / 54* | *568536* |
| *2* | *light red* | *204 / 32 / 50* | *CC2032* |
| *3* | *light blue* | *29 / 108 / 180* | *1D6CB4* |

| Series color # | Color | RGB Decimal | HEX |
|---|---|---|---|
| *4* | *light yellow* | *253 / 211 / 1* | *FDD301* |
| *5* | *magenta* | *129 / 41 / 140* | *81158C* |
| *5* | *orange* | *246 / 138 / 49* | *F68A31* |
| *7* | *grey* | *127 / 127 / 127* | *7F7F7F* |
| *8* | *dark green* | *41 / 89 / 43* | *29592B* |
| *9* | *dark red* | *131 / 20 / 47* | *83142F* |
| *10* | *dark blue* | *14 / 88 / 120* | *0E5878* |
| *11* | *dark yellow* | *180 / 168 / 57* | *B4A839* |
| *12* | *dark magenta* | *82 / 30 / 94* | *521E5E* |
| *13* | *dark orange* | *174 / 101 / 39* | *AE6527* |
| *14* | *dark grey* | *52 / 52 / 52* | *343434* |

## AMEND AND ADD COLORS

**To amend a color:**

1. click on the desired color.
2. Configure the **Name** property.
   Enter the chosen name.
3. Configure the **Color** property.
   Clicking on the arrow next to the color display opens the dialog to select color.

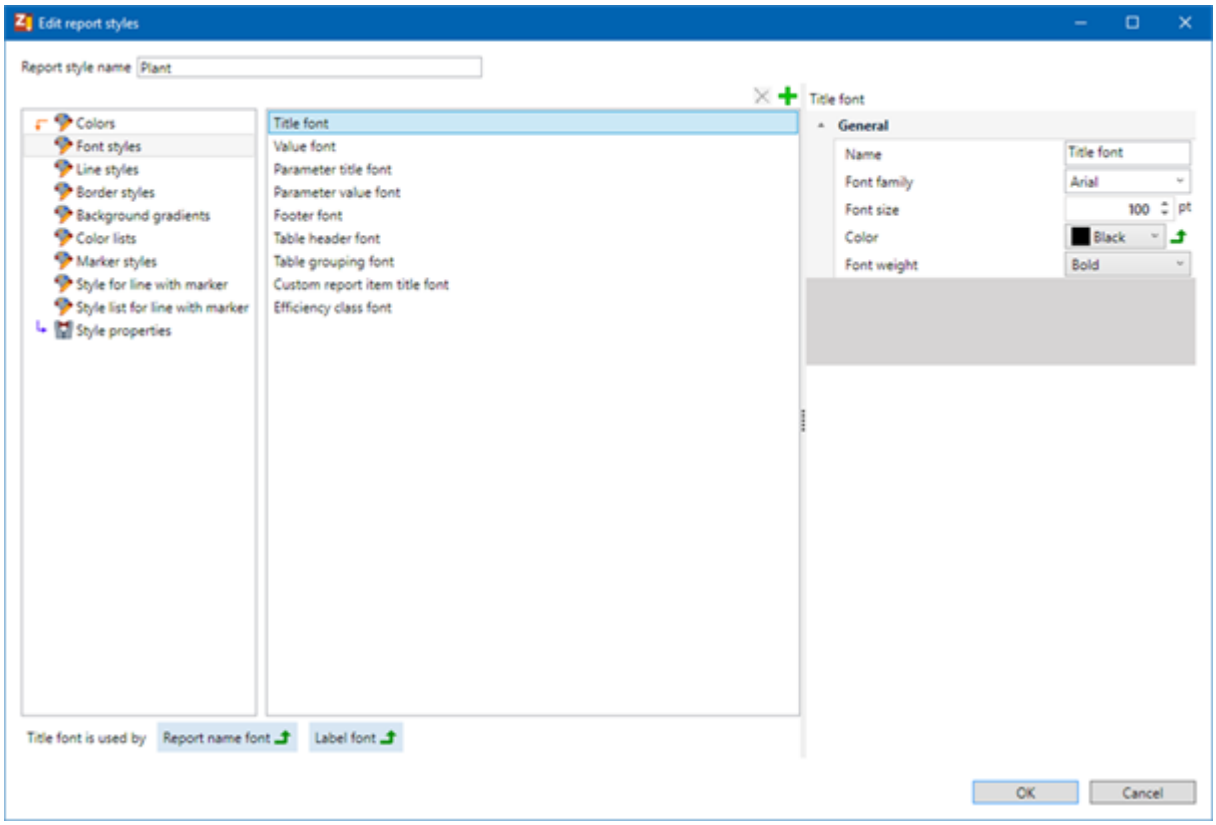
**To add a color:**

1. Click on the symbol to add (green cross).

   a new color with the default values *new color* and *black* is created.
2. Configure the property name:
   Enter the chosen name.
3. Configure the color property.
   Clicking on the arrow next to the color display opens the dialog to select color.

## 12.5.2 Font styles

This style group defines fonts. Fonts can be selected from the fonts available on the system or freely entered. Free entry allows the use of a font that is present on the Analyzer Server but not available in ZAMS. During configuration, there is no check to see whether the selected font is also available on the Analyzer Server when executing the report.



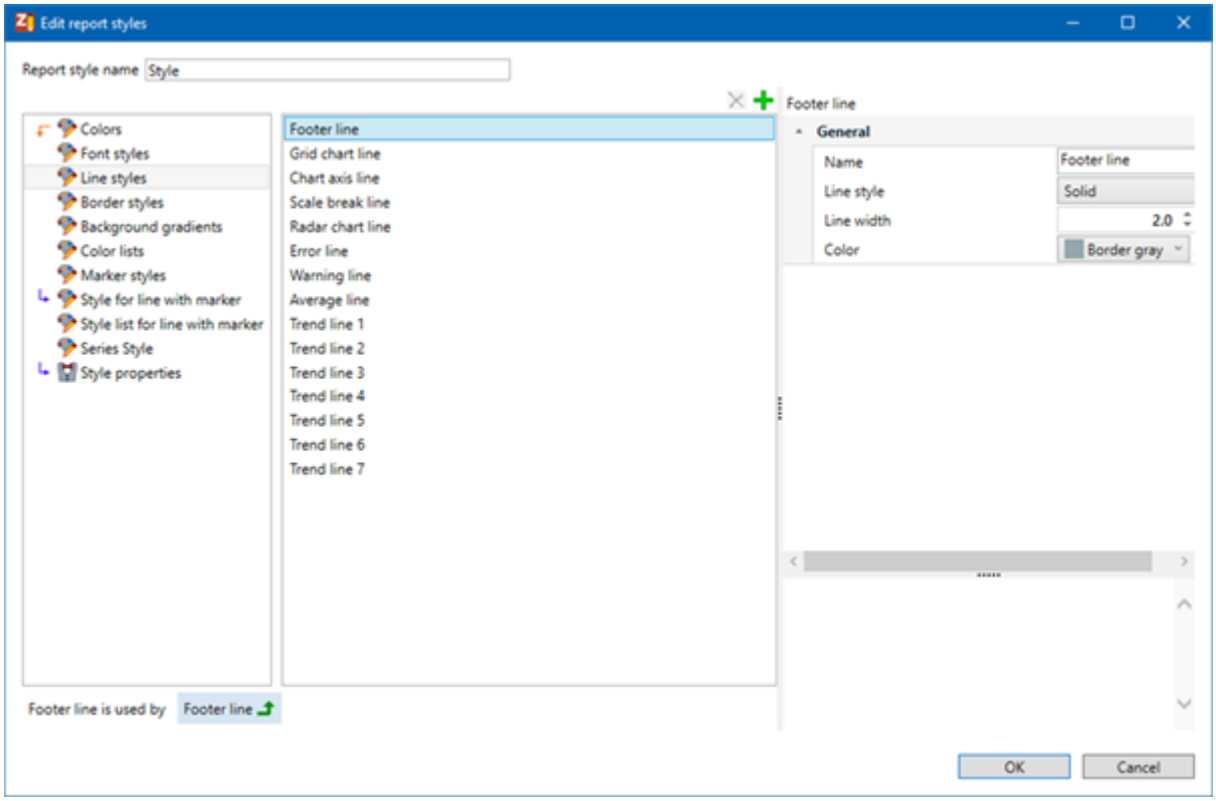

| Style | Properties and default values |
|---|---|
| **Title font** | Properties:<br>▸ **Name**: *Title font*<br>▸ **Font family**: *Arial*<br>▸ **Font size**: *16 pt*<br>▸ **Color**: *Black*<br>▸ **Font weight**: *Bold* |
| **Value font** | Properties:<br>▸ **Name**: *Value font*<br>▸ **Font family**: *Arial*<br>▸ **Font size**: *8 pt* |

| Style | Properties and default values |
|---|---|
| | ▸ **Color**: *Black*<br>▸ **Font weight**: *Normal* |
| **Parameter title font** | Properties:<br>▸ **Name**: *Parameter title font*<br>▸ **Font family**: *Arial*<br>▸ **Font size**: *7 pt*<br>▸ **Color**: *Black*<br>▸ **Font weight**: *Normal* |
| **Parameter value font** | Properties:<br>▸ **Name**: *Parameter value font*<br>▸ **Font family**: *Arial*<br>▸ **Font size**: *12 pt*<br>▸ **Color**: *Black*<br>▸ **Font weight**: *Bold* |
| **Footer font** | Properties:<br>▸ **Name**: *Footer font*<br>▸ **Font family**: *Arial*<br>▸ **Font size**: *6 pt*<br>▸ **Color**: *Black*<br>▸ **Font weight**: *Bold* |
| **Table header font** | Properties:<br>▸ **Name**: *Table header font*<br>▸ **Font family**: *Arial*<br>▸ **Font size**: *9 pt*<br>▸ **Color**: *Black*<br>▸ **Font weight**: *Bold* |
| **Table grouping font** | Properties:<br>▸ **Name**: *Table grouping font*<br>▸ **Font family**: *Arial* |

| Style | Properties and default values |
|---|---|
| | ▸ **Font size**: *8 pt*<br>▸ **Color**: *Black*<br>▸ **Font weight**: *Bold* |
| **Custom report item title font** | Properties:<br>▸ **Name**: *Custom report item title font*<br>▸ **Font family**: *Arial*<br>▸ **Font size**: *(no default value)*<br>▸ **Color**: *Black*<br>▸ **Font weight**: *Normal* |
| **Efficiency class font** | Properties:<br>▸ **Name**: *Efficiency class font*<br>▸ **Font family**: *Arial*<br>▸ **Font size**: *10 pt*<br>▸ **Color**: *Silver*<br>▸ **Font weight**: *Bold* |

## 12.5.3 Line styles

This style group defines styles for the display of lines:




| Style | Properties and default values |
|---|---|
| **Footer line** | Properties:<br>▸ **Name**: *Footer line*<br>▸ **Line style**: *Solid*<br>▸ **Line width**: *2.0 pt*<br>▸ **Color**: *Border gray* |
| **Grid chart line** | Properties:<br>▸ **Name**: *Grid chart line*<br>▸ **Line style**: *Solid*<br>▸ **Line width**: *1.5 pt*<br>▸ **Color**: *Gainsboro* |
| **Chart axis line** | Properties:<br>▸ **Name**: *Chart axis line* |

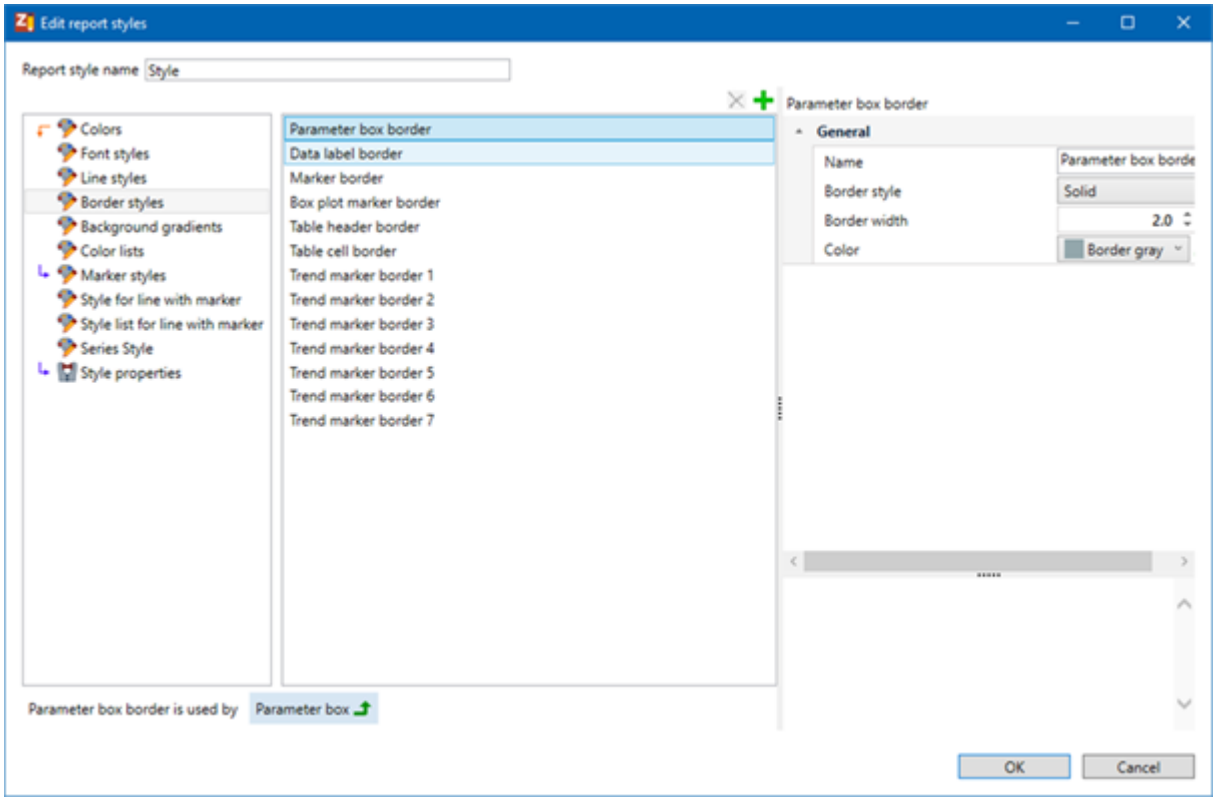
| Style | Properties and default values |
|---|---|
| | ▸ **Line style**: *Solid*<br>▸ **Line width**: *1.5 pt*<br>▸ **Color**: *Dim gray* |
| **Scale break line** | Properties:<br>▸ **Name**: *Scale break line*<br>▸ **Line style**: *Solid*<br>▸ **Line width**: *1.0 pt*<br>▸ **Color**: *Maroon* |
| **Radar chart line** | Properties:<br>▸ **Name**: *Radar chart line*<br>▸ **Line style**: *Solid*<br>▸ **Line width**: *1.0 pt*<br>▸ **Color**: *Dim gray* |
| **Error line** | Properties:<br>▸ **Name**: *Error line*<br>▸ **Line style**: *Solid*<br>▸ **Line width**: *1.0 pt*<br>▸ **Color**: *Red* |
| **Warning line** | Properties:<br>▸ **Name**: *Warning line*<br>▸ **Line style**: *Solid*<br>▸ **Line width**: *1.0 pt*<br>▸ **Color**: *Yellow* |
| **Average line** | Properties:<br>▸ **Name**: *Average line*<br>▸ **Line style**: *Solid*<br>▸ **Line width**: *1.0 pt*<br>▸ **Color**: *Green* |
| **Trend line 1** | Properties: |

| Style | Properties and default values |
|---|---|
| | ▸ **Name**: *Trend line 1*<br>▸ **Line style**: *Solid*<br>▸ **Line width**: *1.0 pt*<br>▸ **Color**: *Series color 1* |
| **Trend line 2** | Properties:<br>▸ **Name**: *Trend line 2*<br>▸ **Line style**: *Solid*<br>▸ **Line width**: *1.0 pt*<br>▸ **Color**: *Series color 2* |
| **Trend line 3** | Properties:<br>▸ **Name**: *Trend line 3*<br>▸ **Line style**: *Solid*<br>▸ **Line width**: *1.0 pt*<br>▸ **Color**: *Series color 3* |
| **Trend line 4** | Properties:<br>▸ **Name**: *Trend line 4*<br>▸ **Line style**: *Solid*<br>▸ **Line width**: *1.0 pt*<br>▸ **Color**: *Series color 4* |
| **Trend line 5** | Properties:<br>▸ **Name**: *Trend line 5*<br>▸ **Line style**: *Solid*<br>▸ **Line width**: *1.0 pt*<br>▸ **Color**: *Series color 5* |
| **Trend line 6** | Properties:<br>▸ **Name**: *Trend line 6*<br>▸ **Line style**: *Solid*<br>▸ **Line width**: *1.0 p*<br>▸ **Color**: *Series color 6* |

| Style | Properties and default values |
|---|---|
| **Trend line 7** | Properties:<br>▸ **Name**: *Trend line 7*<br>▸ **Line style**: *Solid*<br>▸ **Line width**: *1.0 p*<br>▸ **Color**: *Series color 7* |

## 12.5.4 Border styles

This style group defines styles for the display of frames:




| Style | Properties and default values |
|---|---|
| **Parameter box border** | Properties:<br>▸ **Name**: *Parameter box border*<br>▸ **Border style**: *Solid*<br>▸ **Border width**: *2.0 pt*<br>▸ **Color**: *Border gray* |

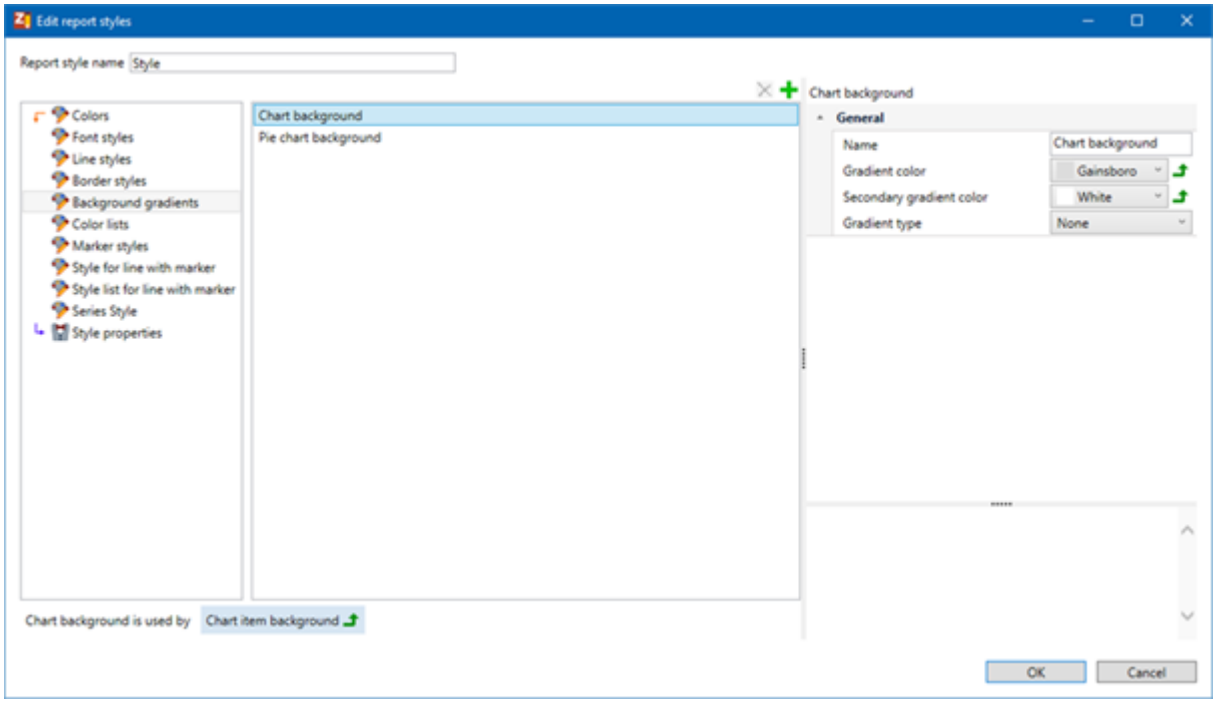
| Style | Properties and default values |
|---|---|
| **Data label border** | Properties:<br>▸ **Name**: *Data label border*<br>▸ **Border style**: *Solid*<br>▸ **Border width**: *3.0 pt*<br>▸ **Color**: *Light gray* |
| **Marker border** | Properties:<br>▸ **Name**: *Marker border*<br>▸ **Border style**: *Solid*<br>▸ **Border width**: *1.0 pt*<br>▸ **Color**: *Series color 5* |
| **Box plot marker border** | Properties:<br>▸ **Name**: *Box plot marker border*<br>▸ **Border style**: *Solid*<br>▸ **Border width**: *1.0 pt*<br>▸ **Color**: *Red* |
| **Table header border** | Properties:<br>▸ **Name**: *Table header border*<br>▸ **Border style**: *Solid*<br>▸ **Border width**: *2.0 pt*<br>▸ **Color**: *dark grey* |
| **Table cell border** | Properties:<br>▸ **Name**: *Table cell border*<br>▸ **Border style**: *Solid*<br>▸ **Border width**: *1.0 pt*<br>▸ **Color**: *dark grey* |
| **Trend marker border 1** | Properties:<br>▸ **Name**: *Trend marker border 1*<br>▸ **Border style**: *Solid*<br>▸ **Border width**: *1.0 pt* |

| Style | Properties and default values |
|---|---|
| | ▸ **Color**: *Series color 1* |
| **Trend marker border 2** | Properties:<br>▸ **Name**: *Trend marker border 2*<br>▸ **Border style**: *Solid*<br>▸ **Border width**: *1.0 pt*<br>▸ **Color**: *Series color 2* |
| **Trend marker border 3** | Properties:<br>▸ **Name**: *Trend marker border 3*<br>▸ **Border style**: *Solid*<br>▸ **Border width**: *1.0 pt*<br>▸ **Color**: *Series color 3* |
| **Trend marker border 4** | Properties:<br>▸ **Name**: *Trend marker border 4*<br>▸ **Border style**: *Solid*<br>▸ **Border width**: *1.0 pt*<br>▸ **Color**: *Series color 4* |
| **Trend marker border 5** | Properties:<br>▸ **Name**: *Trend marker border 5*<br>▸ **Border style**: *Solid*<br>▸ **Border width**: *1.0 pt*<br>▸ **Color**: *Series color 5* |
| **Trend marker border 6** | Properties:<br>▸ **Name**: *Trend marker border 6*<br>▸ **Border style**: *Solid*<br>▸ **Border width**: *1.0 pt*<br>▸ **Color**: *Series color 6* |
| **Trend marker border 7** | Properties:<br>▸ **Name**: *Trend marker border 7*<br>▸ **Border style**: *Solid* |

| Style | Properties and default values |
|---|---|
| | ▸ **Border width**: *1.0 pt*<br>▸ **Color**: *Series color 7* |

## 12.5.5 Background gradients

This style group defines styles for color gradients in the background.

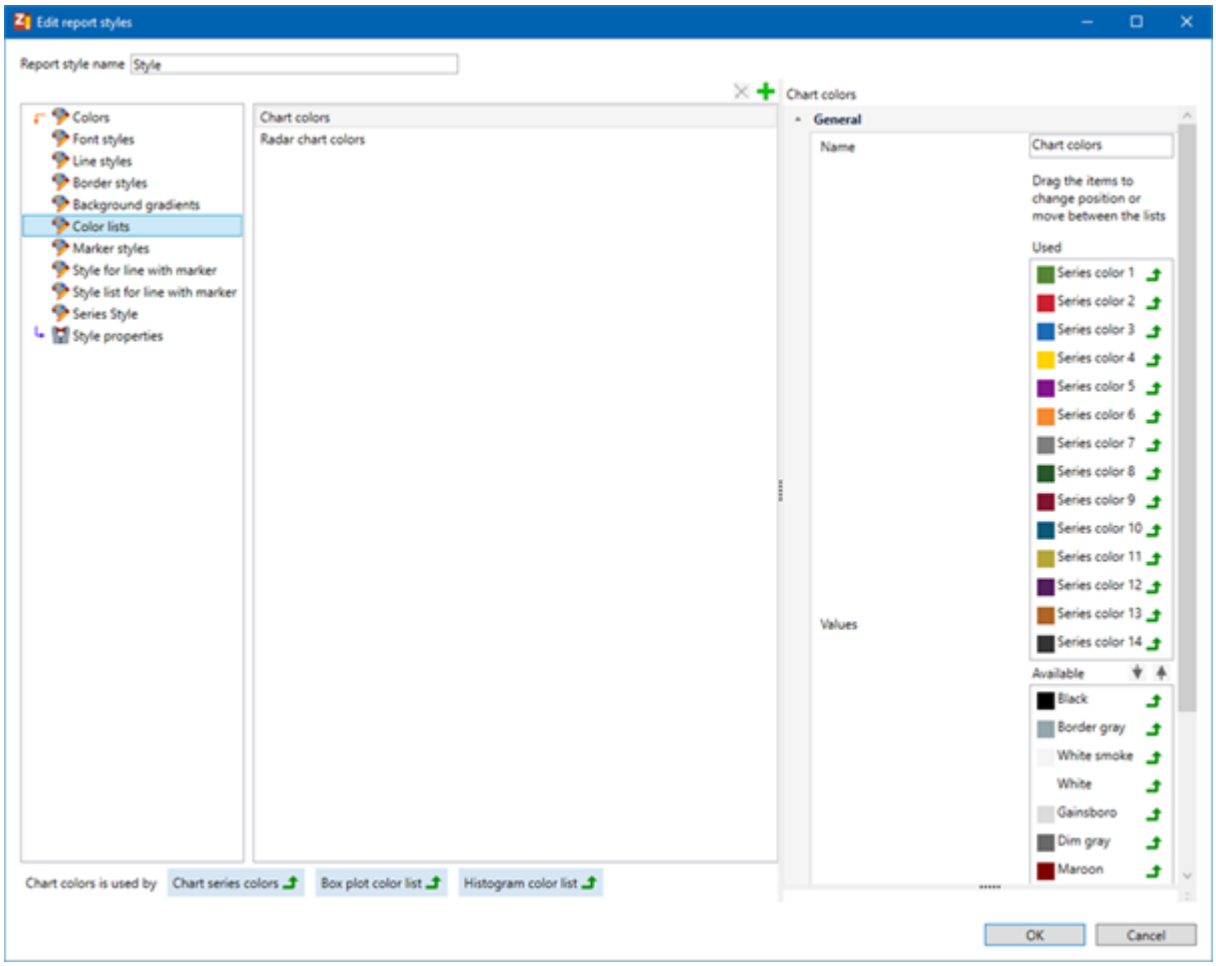



| Style | Properties and default values |
|---|---|
| **Chart background** | Properties:<br>▸ **Name**: *Chart background*<br>▸ **Gradient color**: *Gainsboro*<br>▸ **Secondary gradient color**: *White*<br>▸ **Gradient type**: *None* |
| **Pie chart background** | Properties:<br>▸ **Name**: *Pie chart background*<br>▸ **Gradient color**: *Gainsboro*<br>▸ **Secondary gradient color**: *White* |

| Style | Properties and default values |
|---|---|
| | ▸ **Gradient type**: *Center* |

## 12.5.6 Color lists

This style group defines styles for color lists:




| Style | Properties and default values |
|---|---|
| **Chart colors** | Properties:<br>▸ **Name**: Chart colors<br>▸ **Values**:<br>Uses:<br>*Series color 1*<br>*Series color 2*<br>*Series color 3* |

| Style | Properties and default values |
|---|---|
| | *Series color 4*<br>*Series color 5*<br>*Series color 6*<br>*Series color 7*<br>*Series color 8*<br>*Series color 9*<br>*Series color 10*<br>*Series color 11*<br>*Series color 12*<br>*Series color 13*<br>*Series color 14*<br>Available:<br>*All other colors* |
| **Radar chart colors** | Properties:<br>▸ **Name**: Chart colors<br>▸ **Values**:<br>Uses:<br>*Series color 1*<br>*Series color 2*<br>*Series color 3*<br>*Series color 4*<br>*Series color 5*<br>*Series color 6*<br>*Series color 7*<br>Available:<br>*All other colors* |

## CONFIGURATION

The lists consist of two areas:

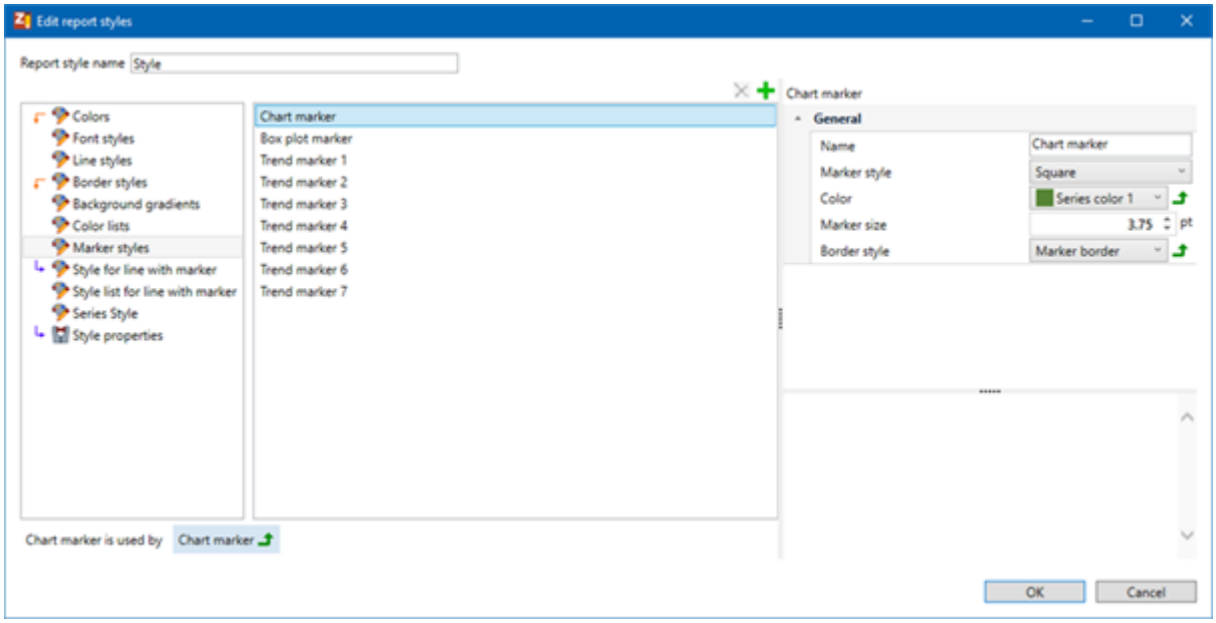
- Lists at the top: Contains all selected entries. These are used for display in <REPORTLAUNCHER>. This list must contain at least one entry.
- Bottom of list: Contains the entries that are available but have not yet been selected.

**Move and arrange entries**

- The entries can be moved between the two lists by dragging&dropping or using the arrow symbols.
- The sequence in a list can be amended using drag&drop.

## 12.5.7 Marker styles

This style group defines styles for the display of markers:



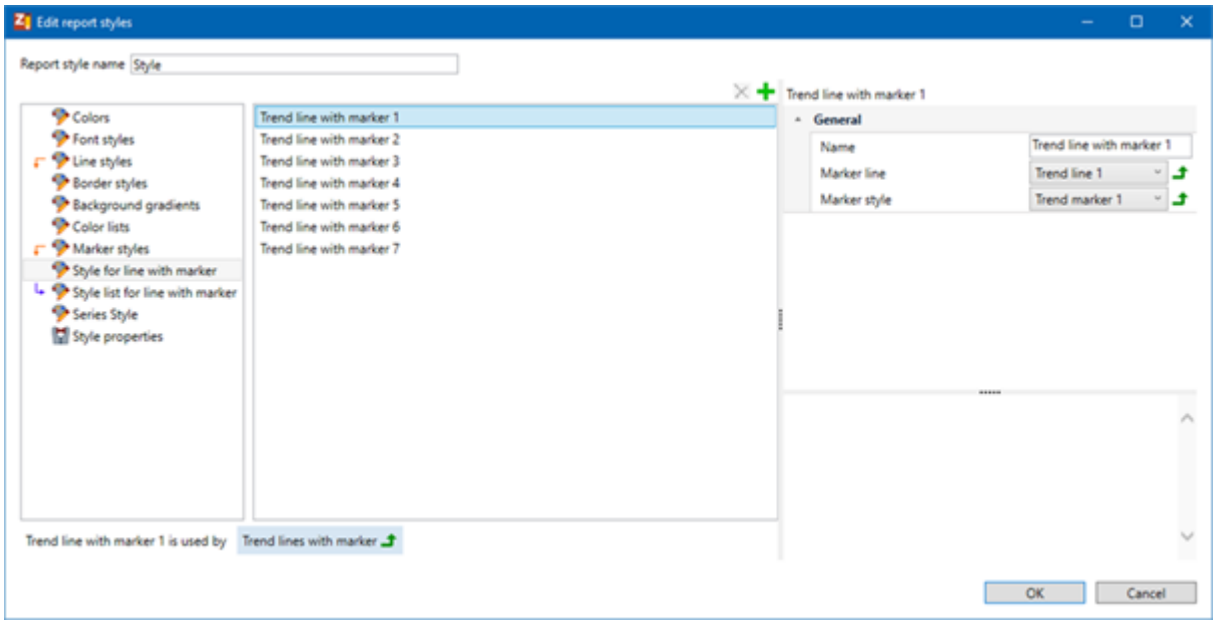

| Style | Properties and default values |
|---|---|
| **Chart marker** | Properties:<br>▸ **Name**: *Chart marker*<br>▸ **Marker style**: *Square*<br>▸ **Color**: *Series color 1*<br>▸ **Marker size**: *3.75 pt*<br>▸ **Border style**: *Marker border* |
| **Box plot marker** | Properties:<br>▸ **Name**: *Box plot marker*<br>▸ **Marker style**: *Cross*<br>▸ **Color**: *Red*<br>▸ **Marker size**: *3.75 pt*<br>▸ **Border style**: *Box plot marker border* |
| **Trend marker 1** | Properties:<br>▸ **Name**: *Trend marker 1*<br>▸ **Marker style**: *Square*<br>▸ **Color**: *Series color 1* |

| Style | Properties and default values |
|---|---|
| | ▸ **Marker size**: *3.75 pt*<br>▸ **Border style**: *Trend marker border 1* |
| **Trend marker 2** | Properties:<br>▸ **Name**: *Trend marker 2*<br>▸ **Marker style**: *Diamond*<br>▸ **Color**: *Series color 2*<br>▸ **Marker size**: *3.75 pt*<br>▸ **Border style**: *Trend marker border 2* |
| **Trend marker 3** | Properties:<br>▸ **Name**: *Trend marker 3*<br>▸ **Marker style**: *Cross*<br>▸ **Color**: *Series color 3*<br>▸ **Marker size**: *3.75 pt*<br>▸ **Border style**: *Trend marker border 3* |
| **Trend marker 4** | Properties:<br>▸ **Name**: *Trend marker 4*<br>▸ **Marker style**: *Stern5*<br>▸ **Color**: *Series color 4*<br>▸ : *3.75 pt*<br>▸ **Border style**: *Trend marker border 4* |
| **Trend marker 5** | Properties:<br>▸ **Name**:*Trend marker 5*<br>▸ **Marker style**: *Stern10*<br>▸ **Color**: *Series color 5*<br>▸ **Marker size**: *3.75 pt*<br>▸ **Border style**: *Trend marker border 5* |
| **Trend marker 6** | Properties:<br>▸ **Name**:*Trend marker 6*<br>▸ **Marker style**: *Triangle* |

| Style | Properties and default values |
|---|---|
| | ▸ **Color**: *Series color 6*<br>▸ **Marker size**: *3.75 pt*<br>▸ **Border style**: *Trend marker border 6* |
| **Trend marker 7** | Properties:<br>▸ **Name**:*Trend marker 7*<br>▸ **Marker style**: *Star 6*<br>▸ **Color**: *Series color 7*<br>▸ **Marker size**: *3.75 pt*<br>▸ **Border style**: *Trend marker border 7* |

## 12.5.8 Style for line with marker

This style group defines styles for the display of lines with markers:

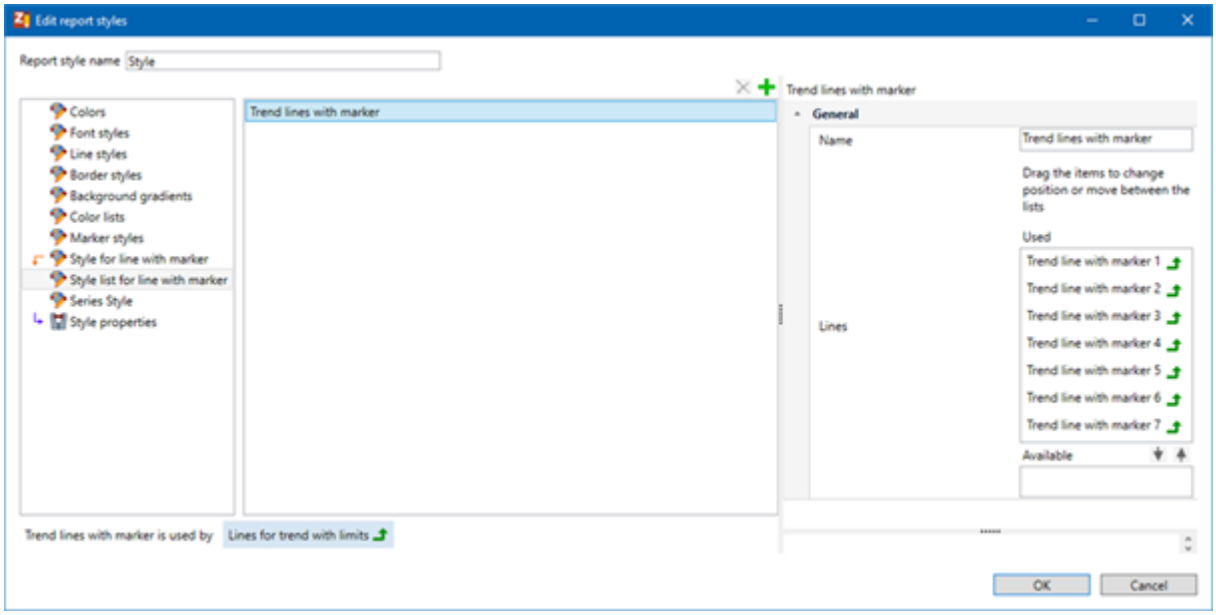



| Style | Properties and default value |
|---|---|
| **Trend line with marker 1** | Properties:<br>▸ **Name**: *Trend line with marker 1*<br>▸ **Marker line**: *Trend line 1*<br>▸ **Marker style**: *Trend marker 1* |

| Style | Properties and default value |
|---|---|
| **Trend line with marker 2** | Properties:<br>▸ **Name**: *Trend line with marker 2*<br>▸ **Marker line**: *Trend line 2*<br>▸ **Marker style**: *Trend marker 2* |
| **Trend line with marker 3** | Properties:<br>▸ **Name**: *Trend line with marker 3*<br>▸ **Marker line**: *Trend line 3*<br>▸ **Marker style**: *Trend marker 3* |
| **Trend line with marker 4** | Properties:<br>▸ **Name**: *Trend line with marker 4*<br>▸ **Marker line**: *Trend line 4*<br>▸ **Marker style**: *Trend marker 4* |
| **Trend line with marker 5** | Properties:<br>▸ **Name**: *Trend line with marker 5*<br>▸ **Marker line**: *Trend line 5*<br>▸ **Marker style**: *Trend marker 5* |
| **Trend line with marker 6** | Properties:<br>▸ **Name**: *Trend line with marker 6*<br>▸ **Marker line**: *Trend line 6*<br>▸ **Marker style**: *Trend marker 6* |
| **Trend line with marker 7** | Properties:<br>▸ **Name**: *Trend line with marker 7*<br>▸ **Marker line**: *Trend line 7*<br>▸ **Marker style**: *Trend marker 7* |

## 12.5.9 Style list for line with marker

This style group defines the style for the display of style lists for lines with markers:




| Style | Properties and default values |
|---|---|
| **Trend lines with marker** | Properties:<br>▸ **Name**: *Trend lines with marker*<br>▸ **Lines**:<br>Used:<br>*Trend line with marker 1*<br>*Trend line with marker 2*<br>*Trend line with marker 3*<br>*Trend line with marker 4*<br>*Trend line with marker 5*<br>*Trend line with marker 6*<br>*Trend line with marker 7*<br>Available:<br>(empty) |

### CONFIGURATION

The lists consist of two areas:

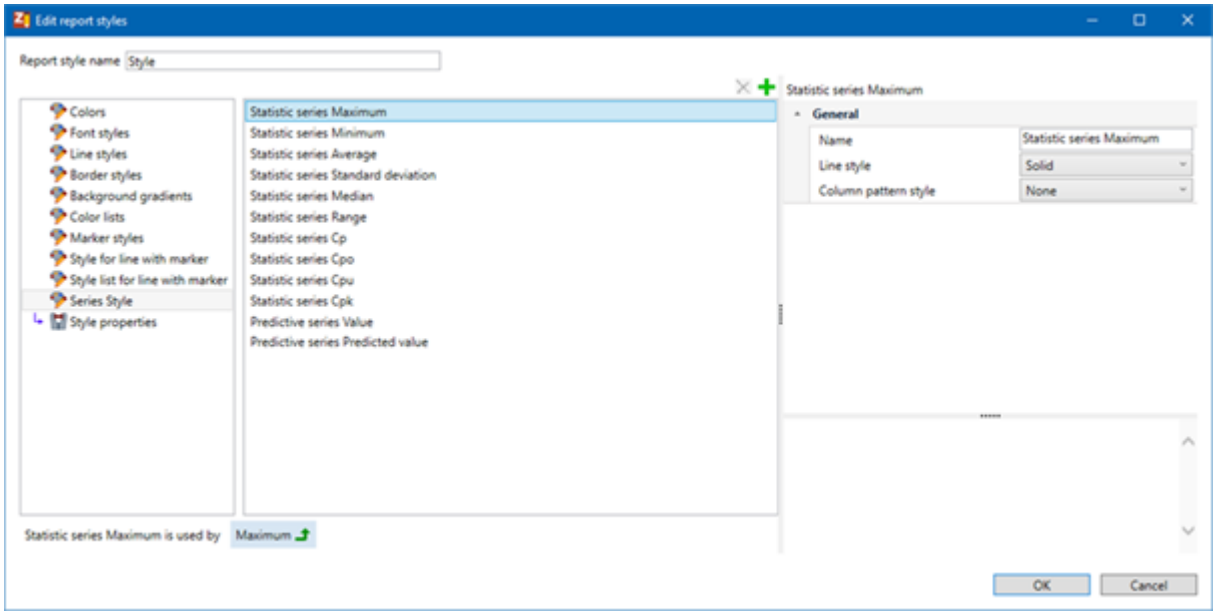
- Lists at the top: Contains all selected entries. These are used for display in <REPORTLAUNCHER>. This list must contain at least one entry.
- Bottom of list: Contains the entries that are available but have not yet been selected.

**Move and arrange entries**

- The entries can be moved between the two lists by dragging&dropping or using the arrow symbols.
- The sequence in a list can be amended using drag&drop.

## 12.5.10 Series Style

This style group defines styles for the display of the fill for columns and bars:




| Style | Properties and default values |
|---|---|
| **Statistic series Maximum** | Properties:<br>▸ **Name**: *Statistic series Maximum*<br>▸ **Line style**: *Solid*<br>▸ **Column pattern style**: *None* |
| **Statistic series Minimum** | Properties:<br>▸ **Name**: *Statistic series Minimum*<br>▸ **Line style**: *Solid*<br>▸ **Column pattern style**: *None* |
| **Statistic series Average** | Properties:<br>▸ **Name**: *Statistic series Average* |

| Style | Properties and default values |
|---|---|
| | ▸ **Line style**: *Solid*<br>▸ **Column pattern style**: *None* |
| **Statistic series Standard deviation** | Properties:<br>▸ **Name**: *Statistic series Standard deviation*<br>▸ **Line style**: *Dash dot*<br>▸ **Column pattern style**: *None* |
| **Statistic series Median** | Properties:<br>▸ **Name**: *Statistic series Median*<br>▸ **Line style**: *Dotted*<br>▸ **Column pattern style**: *None* |
| **Statistic series Range** | Properties:<br>▸ **Name**: *Statistic series Range*<br>▸ **Line style**: *Dashed*<br>▸ **Column pattern style**: *None* |
| **Statistic series Cp** | Properties:<br>▸ **Name**: *Statistic series Cp*<br>▸ **Line style**: *Solid*<br>▸ **Column pattern style**:*none* |
| **Statistic series Cpo** | Properties:<br>▸ **Name**: *Statistic series Cpo*<br>▸ **Line style**: *Dashed*<br>▸ **Column pattern style**: *None* |
| **Statistic series Cpu** | Properties:<br>▸ **Name**: *Statistic series Cpu*<br>▸ **Line style**: *Dash dot*<br>▸ **Column pattern style**: *None* |
| **Statistic series Cpk** | Properties:<br>▸ **Name**: *Statistic series Cpk*<br>▸ **Line style**: *Dash dot dot* |

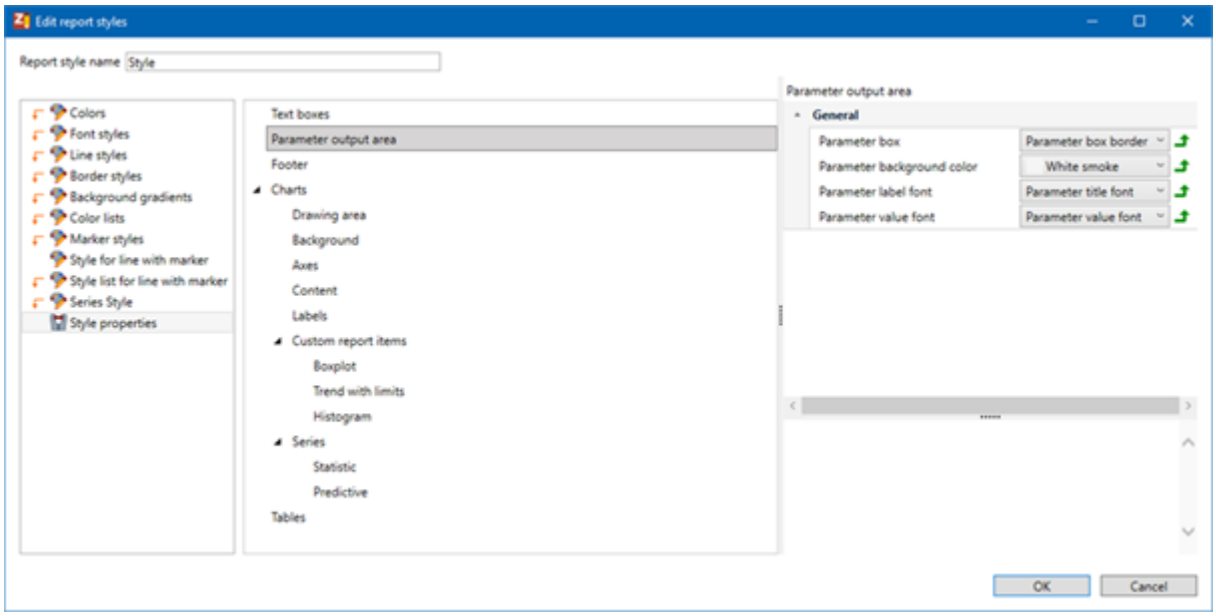
| Style | Properties and default values |
|---|---|
| | ▸ **Column pattern style**: *Narrow horizontal* |
| **Predictive series Value** | Properties:<br>▸ **Name**: *Predictive series Value*<br>▸ **Line style**: *Solid*<br>▸ **Column pattern style**: *None* |
| **Predictive series Predicted value** | Properties:<br>▸ **Name**: *Predictive series Predicted value*<br>▸ **Line style**: *Dash dot dot*<br>▸ **Column pattern style**: *Narrow horizontal* |

## 12.5.11 Style properties

This style group defines independent styles for:

- Text fields
- Parameter output area
- Footer
- Diagrams
  - Custom report items (CRI)
  - Series

- Tables




## GENERAL

| Style | Properties and default values |
|---|---|
| **Text fields** | Properties:<br>- **Report name font**: *Title font*<br>- **Label font**: *Title font*<br>- **Value font**: *Font for value fields* |
| **Parameter output area** | Properties:<br>- **Parameter box**: *Parameter box borders*<br>- **Parameter background color**: *White smoke*<br>- **Parameter label font**: *Parameter title font*<br>- **Parameter value font**: *Font for parameter values* |
| **Footer** | Properties:<br>- **Footer font**: *Footer font*<br>- **Footer line**: *Footer line* |

## DIAGRAMS

| Style | Properties and default values |
|---|---|
| **Drawing area** | Properties:<br>▸ **Grid lines**: *Line for diagram window*<br>▸ **Chart area background color**: *White*<br>▸ **Chart area background interlace color**: *Gainsboro* |
| **Background** | Properties:<br>▸ **Chart item background**: *Chart background*<br>▸ **Pie chart item background**: *Background for chart diagram* |
| **Axes** | Properties:<br>▸ **Chart axis font**: *Font for value fields*<br>▸ **Chart axis line**: *Chart axis line*<br>▸ **Chart axis scale break line**: *Scale break line*<br>▸ **Scale break spacing**: *2.0 %* |
| **Content** | Properties:<br>▸ **Chart series colors**: *Chart colors*<br>▸ **Area chart line color**: *Series color 1*<br>▸ **Area chart area color**: *Series color 1*<br>▸ **Area chart area transparency**: *71 %*<br>▸ **Radar chart series colors**: *Colors for radar charts*<br>▸ **Radar chart series transparency**: *55 %*<br>▸ **Radar chart series border**: *Line for radar chart* |
| **Labels** | Properties:<br>▸ **Chart legend font**: *Font for value fields*<br>▸ **Data label box**: *Border for data label*<br>▸ **Data label background color**: *Light gray*<br>▸ **Data label font**: *Font for value fields*<br>▸ **Chart marker**: *Chart marker* |

| Style | Properties and default values |
|---|---|
| **Custom report items** | Properties for the configuration of the custom report items:<br>▸ **Box plot**<br>▸ **Efficiency classes**<br>▸ **Gantt Chart**<br>▸ **Histogram**<br>▸ **Carpet Plot**<br>▸ **Sankey Diagram**<br>▸ **Trend with Limits**<br>For details, see the Configure user-defined report elements (on page 300) chapter. |
| **Series** | Properties for the configuration of series:<br>▸ **Statistics**<br>▸ **Prediction**<br>For details, see Series (on page 308). |

### TABLES

| Style | Properties and default values |
|---|---|
| **Tables** | Properties:<br>▸ **Even rows background color**: *White*<br>▸ **Odd rows background color**: *White smoke*<br>▸ **Header cell font**: *Font for table overview*<br>▸ **Body cell font**: *Font for value fields*<br>▸ **Grouping header font**: *Table grouping font*<br>▸ **Header cell border**: *Table header border*<br>▸ **Body cell border**: *Table cell border* |

## 12.5.11.1 Configure custom report items (CRI)

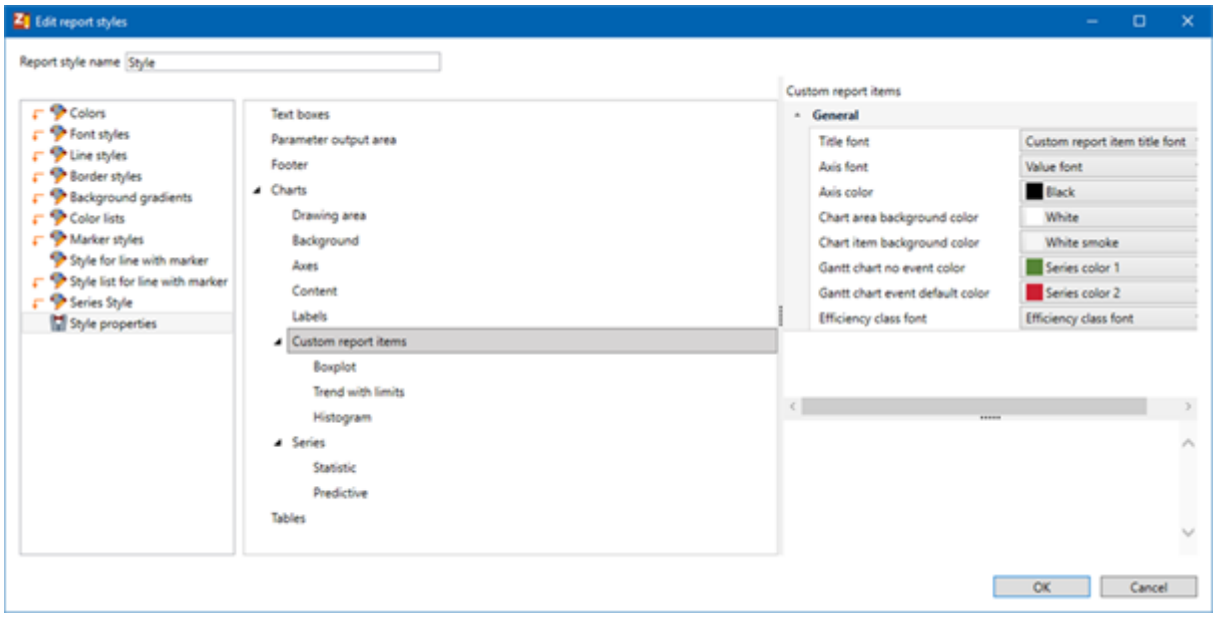
Custom report items are configured in the **Style properties** (on page 297) group in the **Diagrams/User-defined report elements** area.

**User-defined report elements**:

- **Box plot**
- **Efficiency classes**
- **Gantt Chart**
- **Histogram**
- **Carpet Plot**
- **Sankey Diagram**
- **Trend with Limits**

To configure user-defined report elements, select the appropriate properties in the dialog for report styles and give them the desired values.

## DIALOG CONFIGURATION




| Style | Properties and default values |
|---|---|
| **Custom report items** | General properties for custom report items:<br>▸ **Title font:** *Custom report item title font*<br>▸ **Axis font**: *Font for value fields*<br>▸ **Axis color**: *Black*<br>▸ **Chart area background color**: *White*<br>▸ **Chart item background color**: *White smoke*<br>▸ **Gantt chart no event color**: *Series color 1* |

| Style | Properties and default values |
|---|---|
| | ▸ **Gantt chart event default color**: *Series color 2*<br>▸ **Efficiency class font**: *Efficiency class font* |
| **Boxplot** | Properties for box plot:<br>▸ **Box plot marker**: *Box plot marker*<br>▸ **Box plot color list**: *Chart colors*<br>▸ **Box plot box fill transparency**: *50 %*<br>▸ **Box plot median color**: *Olive green* |
| **Trend with Limits** | Properties for trend with limits:<br>▸ **Error line for trend with limits**: *Error line*<br>▸ **Warning line for trend with limits**: *Warning line*<br>▸ **Average line for trend with limits**: *Line for average*<br>▸ **Transparency for trend with limits**: *70%*<br>▸ **Lines for trend with limits**: *Trend line with marker* |
| **Histogram** | Properties for histogram:<br>▸ **Histogram color list**: *Chart colors*<br>▸ **Histogram transparency**: *50 %*<br>▸ **Bell curve line style**: *Solid*<br>▸ **Bell curve line width**: *1.0 pt*<br>▸ **Statistical indicator line style**: *Dashed*<br>▸ **Statistical indicator line width**: *1.0 pt* |

## SPECIAL CUSTOM REPORT ITEMS

There is detailed information on configuration available for some custom report items. These are primarily intended for report developers:

- Boxplot
- Histogram
- Trend with Limits

### BOXPLOT

This custom report item displays box plots.

**Elements:**

- Title (optional)
  If the title is too long for the defined space, an error message is shown.
- Drawing area (left)
- Key (right)

**Drawing area:**

- 1 box per variable:
  - 1 color per variable. The color list is restarted from the beginning when the end is reached.
  - Display from left to right.
  - Variables are sorted alphabetically in ascending order.
- Lower end of the box: lower quartile
- Upper end of the box: upper quartile
- Horizontal line within the box: Median
- Horizontal lines above and below the box (with the box connected by a vertical line): lower and upper whisker
- Markings above the upper whisker or below the lower whisker: Outlier
  Definition of outlier:
  - Higher than upper quartile + 1.5 * quartile distance
  - Lower than lower quartile – 1.5* quartile distance)

  Markers are colored separately for outliers.
  An error is reported if there are too many variables in the diagram. 1 box needs at least 3 outlier marker widths.

**Key:**

- Can require a maximum of 50% of the overall width of the element.
- 1 line per variable.
  Coloring and sorting as per boxes.
- A text is shortened if it is too long.
  Mode: A part from the middle of the text is replaced by **...**.
  Background: The variable name is always at the end of the full name (**Project#Archive – Variable**).

- If there are more variables present than can be displayed in the box, **...** is written in the key instead of the last drawable variables.

Properties in the **Data** category:

| Name | Description |
|---|---|
| **DataSetName** | Name of the data set. |
| **HigherQuartile** | Field access for the upper quartile. |
| **HigherWhisker** | Field access for the upper whisker. |
| **IsOutlier** | Field access for the outlier flag. |
| **LowerQuartile** | Field access for the lower quartile. |
| **LowerWhisker** | Field access for the lower whisker. |
| **Median** | Field access for the median. |
| **Timestamp** | Field access for the time stamp. |
| **Unit** | Field access for the unit. |
| **Value** | Field access for the value. |
| **VariableName** | Field access for the variable names. |

## TREND WITH LIMITS

This custom report element allows the drawing of 1-N trend lines with limit values (target value, warning limits, error limits).

Properties in the **Data** category:

| Name | Description | Default |
|---|---|---|
| **DataSetName** | Name of the data set from which the data comes. | Empty |
| **VariableName** | Access to the column for the variable names | Empty |
| **OrderIndex** | Access to the column for the sorting number of a value | Empty |
| **StartTimeStamp** | Access to the column for the start time stamp of a value | Empty |
| **EndTimeStamp** | Access to the column for the end time stamp of a value | Empty |
| **Value** | Access to the column for a value | Empty |

| Name | Description | Default |
|---|---|---|
| **Unit** | Access to the column for the unit of a value | Empty |

Properties in the **Limits** category:

| Name | Description | Default |
|---|---|---|
| **HigherErrorLimit** | Upper error limit | *0* |
| **HigherWarningLimit** | Upper warning limit | *0* |
| **TargetValue** | Target value | *0* |
| **LowerWarningLimit** | Lower warning limit | *0* |
| **LowerErrorLimit** | Lower error limit | *0* |

In the event of validation errors, nothing is drawn and an error message is shown.

**Validations:**

- If not otherwise described, no property can remain empty.
- If only 1 variable is present, the variable name can remain empty.
- If 2 or more variables are present, each variable must have a unique name.
- The following is applicable for the selected element of the horizontal axis: Each value must have a value in this column that is unique within the variables.
- If only the error messages are displayed, the upper error limit must be greater than the lower error limit.
- The following is applicable if all limits are displayed: Lower error limit < Upper warning limit < Target value < Upper warning limit < Upper error limit.

**Notes on drawing:**

- The key is only drawn if at least one variable is present and its name is not empty.
- Labels are shown with the unit if all variables have the same unit and it is not empty.
- If labeling for limits would overlap, these are moved until the overlap has been removed. In doing so, the labeling does not leave the area of the axis however.
- On the axes, assignment lines are drawn between the labeling and the position they represent on the axis.
- Time stamp is shown on the horizontal axis on two lines. If the sorting number is selected, this is shown on one line.

## HISTOGRAM

This custom report item displays histograms.

**Graphic display (CRI):**

- Everything that belongs to a variable has the same color.
- Frequency distribution is carried out in classes (columns).
- The bell curve is activated by default and is shown with a solid line. Can be deactivated.
- Minimum, average, maximum, sigma, 2 x sigma, 3 x sigma: All can be optionally deactivated.
  - Default: Only 1-sigma is activated and is shown with dotted lines.
- Colors and alpha value for column filling can be configured in the report lists.
- The CRI only shows values on the axes.

**Elements:**

- Title (optional)
  If the title is too long for the defined space, an error message is shown.
- Drawing area (left)
- Key (right)

**Drawing area:**

- One histogram per variable:
  - 1 color per variable. The color list is restarted from the beginning when the end is reached.
  - Display from left to right.
  - Variables are sorted alphabetically in ascending order.
  - The number of classes is derived from the number of values:
    Minimum: 7 classes
    Maximum: 20 classes
    In between: $\sqrt{n}$ for $50 < n < 400$ (n is the number of classified values)
- Gaussian bell curve: Calculated from the values of the respective variable. Shown by default. Line style and line width can be configured. Default each a solid line with a width of 1 point.
- Lines for minimum, maximum, and 1, 2, 3 standard deviations (sigma) are calculated from the values of the respective variable.
  The lines for 1 sigma are shown by default.
  Line style and line width can be configured. Default each with dotted line and a width of 1 point.
- Drawing area:
  The drawing area is amended to the space required by the histograms. For the vertical

dimension, the height of the bell curve is also taken into account. The highest point of the bell curve is thus always visible. In addition, a border of 5% to the left, right and above the data displayed is still taken into account. The elements thus do not make contact with the border of the drawing area directly.
The indicator lines are not taken into account. For example, the sigma lines can be outside the drawing area and thus invisible.

- Histogram:
  If different variables with very different value ranges are used, which lead to the histograms being drawn in a very cramped manner; there may be only limited visibility of the data.

**Key:**

- Can require a maximum of 50% of the overall width of the element.
- 1 line per variable.
  Coloring and sorting as per histograms.
- A text is shortened if it is too long.
  Mode: A part from the middle of the text is replaced by **...**.
  Background: The variable name is always at the end of the full name (**Project#Archive – Variable**).
- If there are more variables present than can be displayed in the box, **...** is written in the key instead of the last drawable variables.

**Vertical axis:**

- Instead of a unit, the histogram has its own configurable text for the vertical axis.

Properties in the **Data** category:

| Name | Description |
|---|---|
| **Average** | Field access for average of a variable. |
| **ClassLower** | Field access for lower class limit. |
| **ClassHigher** | Field access for upper class limit. |
| **Count** | Field access for number of values in a class. |
| **DataSetName** | Name of the data set. Is always present. |
| **Maximum** | Field access for maximum of a variable. |
| **Minimum** | Field access for minimum of a variable. |
| **StandardDeviation** | Field access for the standard deviation of a variable. |
| **Unit** | Field access for the unit. |
| **Variable** | Field access for the variable names. |

## 12.5.11.2 Series

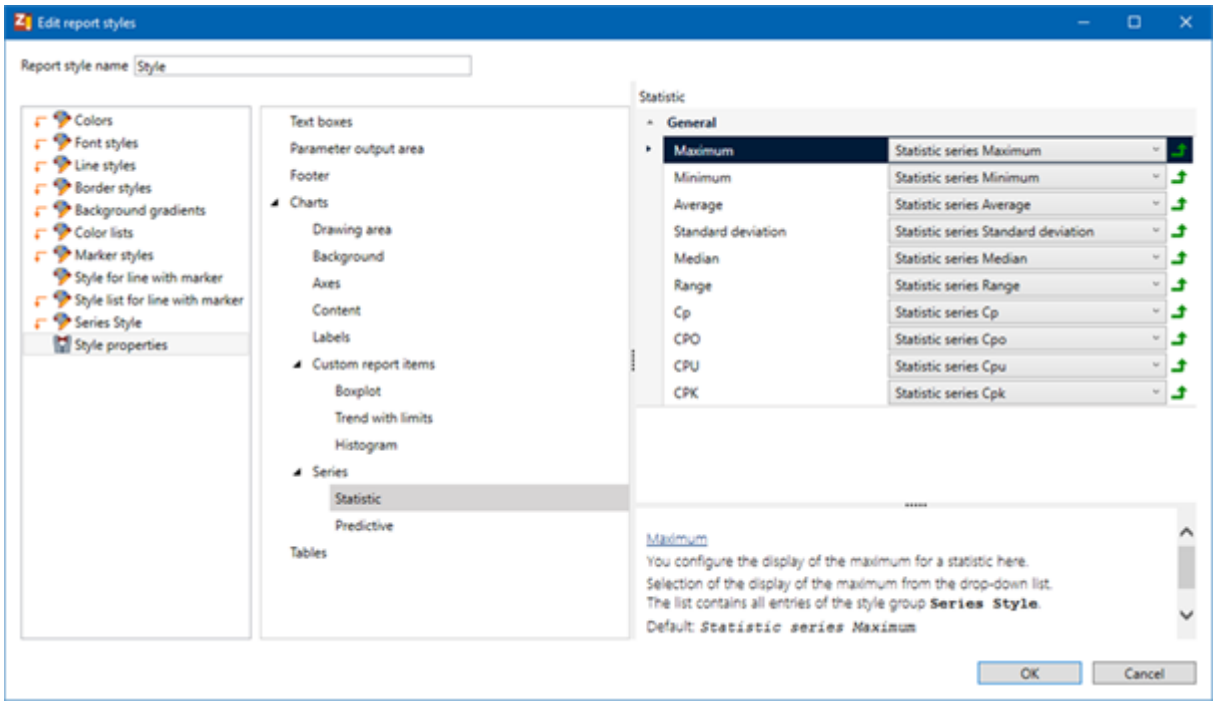
The display of series is configured in the **Style properties** (on page 297) group in the **Series** area.

**Series**

- **Statistics**
- **Predictive**

To configure series, select the appropriate properties in the dialog for report styles and give them the desired values.

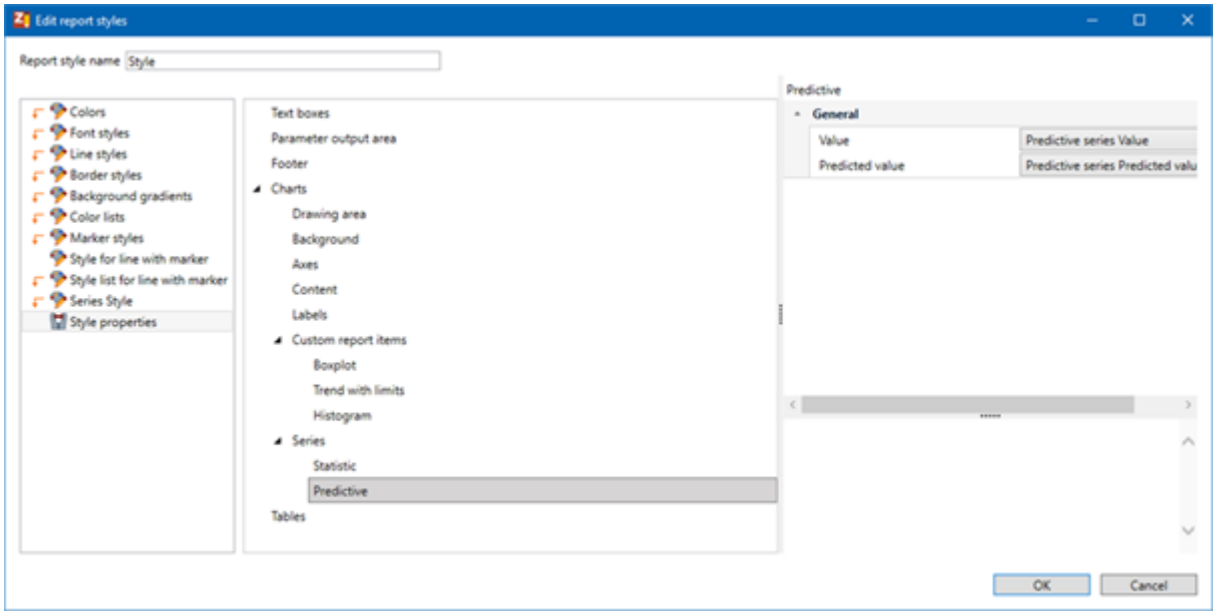
### DIALOG FOR CONFIGURATION OF STATISTICS




| Style | Properties and default values |
|---|---|
| **General** | General properties for series styles:<br>▸ **Maximum:** *Statistic series Maximum*<br>▸ **Minimum:** *Statistic series Minimum*<br>▸ **Average:** *Statistic series Average*<br>▸ **Standard deviation:** *Statistic series Standard deviation* |

| Style | Properties and default values |
|---|---|
| | ▸ **Median:** *Statistic series Median*<br>▸ **Range:** *Statistic series Range*<br>▸ **Cp:** *Statistic series Cp*<br>▸ **CPO:** *Statistic series Cpo*<br>▸ **CPU:** *Statistic series Cpu*<br>▸ **CPK:** *Statistic series Cpk* |

### DIALOG FOR CONFIGURATION OF PREDICTIONS




| Style | Properties and default values |
|---|---|
| **General** | General properties for prediction styles:<br>▸ **Value:** *Predictive series Value*<br>▸ **Predicted value:** *Predictive series Predicted value* |

## 12.6 Properties for report styles

Styles are defined by properties. Precisely one value can be selected for each property. The value of a property can also be another style. In this case, a green arrow refers to this style as a link.

### INPUT OF VALUE

Values are entered, depending on the property, by:

- Selection from a drop-down list
- Selection from a color palette
- Selection from a list.
- Direct entry in a field
- Configuration with a spincontrol

## 12.6.1 Name

You configure the name of a style with this property.

| Property | Description |
|---|---|
| **Name** | Name of the style.<br>Free entry in the text field.<br><br>**Limitation:** Leading or closing spaces are not possible. |

## 12.6.2 Colors

Properties for the configuration of colors.

### 12.6.2.1 Axis color

With this property, you configure the color of the axes (group/**Style properties (on page 297)Custom Report Elements**) for:

- Gantt Chart
- Efficiency Class Diagram
- Carpet Plot
- Sankey Diagram
- Histogram
- Box Plot
- Trend with Limits

| Property | Description |
|---|---|
| **Axis color** | Selection of the color of the axes from a drop-down list.<br>The list contains all entries of the style group **Colors** (on page 275).<br><br>Default:: *Black* |

### 12.6.2.2 Box plot median color

With this property, you configure the median color for a boxplot (**Style properties** (on page 297)group/**Boxplot**).

| Property | Description |
|---|---|
| **Box plot median color** | Selection of the color for the median display in the box plot from a drop-down list.<br>The list contains all entries of the style group **Colors** (on page 275).<br><br>Default:: *Olive green* |

### 12.6.2.3 Color

With this property, you configured colors that are used in the report and by other styles.

| Property | Description |
|---|---|
| **Color** | Configuration is carried out, regardless of style:<br>▸ Selection of the color from a palette:<br>Clicking on the arrow next to the color opens the dialog to select a color.<br>▸ Selection of the color according to name:<br>This is administered in the **Colors** (on page 275) report style group. |

### 12.6.2.4 Chart series colors

With this property, you configure the color for diagram series (**Style properties** (on page 297) group/**Content**).

| Property | Description |
|---|---|
| **Chart series colors** | Selection of the color list for the chart series from a drop-down list.<br>The list contains all entries of the style group **Color lists** (on page 288).<br><br>Default:: *Chart colors* |

### 12.6.2.5 Box plot color list

With this property, you configure the color list for boxplot (**Style properties** (on page 297) group/**Boxplot**).

| Property | Description |
|---|---|
| **Box plot color list** | Selection of the color lists for box plot from a drop-down list.<br>The list contains all entries of the style group **Color lists** (on page 288).<br><br>Default:: *Chart colors* |

### 12.6.2.6 Histogram color list

With this property, you configure the color list for a histogram (**Style properties** (on page 297) group/**Histogram**).

| Property | Description |
|---|---|
| **Histogram color list** | Selection of the color lists for histograms from a drop-down list.<br>The list contains all entries of the style group **Color lists** (on page 288).<br><br>Default:: *Chart colors* |

### 12.6.2.7 Area chart area color

With this property, you configure the area color for area diagrams (**Style properties** (on page 297) group/**Content**).

| Property | Description |
|---|---|
| **Area chart area color** | Selection of the color for the area of an area chart from a drop-down list.<br>The list contains all entries of the style group **Colors** (on page 275).<br><br>Default:: *Series color 1* |

## 12.6.2.8 Gradient type

With this property, you configure the gradient of colors in the **Color gradients** (on page 311) group.

| Property | Description |
|---|---|
| **Gradient type** | Selection of a color gradient type from drop-down list. The background is colored with the selected color gradient type, starting from the basic color through to the gradient end color. The following values are available:<br>▸ *None*<br>▸ *Left right*<br>▸ *Top bottom*<br>▸ *Center*<br>▸ *Diagonal left*<br>▸ *Vertical center* |

**Note:** The *diagonal right* and *horizontal centered* types are not available. If you want to use these types, you can select this in the Microsoft Report Builder in the properties of the graphics object. If these types are set using dynamic expressions, such as a .NET code call, then they are shown as *Top Bottom*.

## 12.6.2.9 Gantt chart event default color

With this property, you configure the default color for events in the Gantt chart (**Style properties** (on page 297) group/**Custom Report Elements**).

| Property | Description |
|---|---|
| **Gantt chart event default color** | Selection of the default color for events in the Gantt chart.<br>The list contains all entries of the style group **Colors** (on page 275).<br>Default:: *Series color 2* |

### 12.6.2.10 Gantt chart no event color

With this property, you configure the color for Gantt charts with *no result* (**Style properties** (on page 297) group/**Custom Report Elements**).

| Property | Description |
|---|---|
| **Gantt chart no event color** | Selection of the color from a drop-down list.<br>The list contains all entries of the style group **Colors** (on page 275).<br><br>Default:: *Series color 1* |

### 12.6.2.11Chart area background color (custom report items)

With this property, you configure the background color of the graphics area (**Style properties** (on page 297) group/**Custom Report Elements**):

- Gantt Chart
- Efficiency Class Diagram
- Carpet Plot
- Sankey Diagram
- Histogram
- Box Plot
- Trend with Limits

| Property | Description |
|---|---|
| **Chart area background color** | Selection of the chart area background color from a drop-down list.<br>The list contains all entries of the style group **Colors** (on page 275).<br><br>Default: *White* |

### 12.6.2.12 Chart item background color (custom report items)

With this property, you configure the background color of the graphics object (**Style properties** (on page 297) group/**Custom Report Elements**) for:

- Gantt Chart
- Efficiency Class Diagram
- Carpet Plot

- Sankey Diagram
- Histogram
- Box Plot
- Trend with Limits

| Property | Description |
|---|---|
| **Chart item background color** | Selection of the color for the background of a chart item from a drop-down list.<br>The list contains all entries of the style group **Colors** (on page 275).<br><br>Default: *White smoke* |

### 12.6.2.13 Chart area background color (Drawing area)

With this property, you configure the background color of the graphics area (**Style properties** (on page 297) group).

The background of the chart area is the area that is in the actual chart. The area is limited by axes. The background of the chart area is colored alternately with the background color and the secondary color. Pie charts always have a transparent background in this area.

| Property | Description |
|---|---|
| **Chart area background color** | Selection of the color for the background from a drop-down list.<br>The list contains all entries of the style group **Colors** (on page 275).<br><br>Default: (dependent on chart type) *white* or *white - Gainsboro* |

### 12.6.2.14 Chart item background (Drawing area)

With this property, you configure the background color of the graphics object in the **Style properties** (on page 297) group.

The object background is the area that comprises the chart in the report including keys and axes.

| Property | Description |
|---|---|
| **Chart item background** | Selection of the color gradient for the background of a chart item from a drop-down list.<br>The list contains all entries of the style group **Color gradients** (on page 311). |

| Property | Description |
|---|---|
| | Default: *Chart background* |

## 12.6.2.15 Pie chart item background

With this property, you configure the background of the pie chart in the **Style properties** (on page 297) group.

The background is the area that is in the actual chart. The area is limited by axes. Pie charts always have a transparent background in this area. Other diagrams have a gradient of two colors.

| Property | Description |
|---|---|
| **Pie chart item background** | Selection of the color for the background of pie charts.<br>The list contains all entries of the style group **Background gradients** (on page 287).<br><br>Default: *Background for pie chart diagram* |

## 12.6.2.16 Data label background color

With this property, you configure the background color for data recordings (**Style properties** (on page 297) group/**Labels**):

| Property | Description |
|---|---|
| **Data label background color** | Selection of the color for the background of the data description from a drop-down list.<br>The list contains all entries of the style group **Colors** (on page 275).<br><br>Default: *Light gray* |

## 12.6.2.17 Even rows background color

With this property, you configure the background color for straight rows (**Style properties** (on page 297) group/**Tables**):

| Property | Description |
|---|---|
| **Even rows** | Selection of the background color for even rows in the table from a |

| Property | Description |
|---|---|
| **background color** | drop-down list.<br>The list contains all entries of the style group **Colors** (on page 275).<br>Default: *White* |

## 12.6.2.18 Parameter background color

With this property, you configure the **parameter output area** in the **Style properties** (on page 297) group.

| Property | Description |
|---|---|
| **Parameter background color** | Selection of the color for the background color for the parameter field from a drop-down list.<br>The list contains all entries of the style group **Border styles** (on page 284).<br>Default:: *White smoke* |

## 12.6.2.19 Odd rows background color

With this property, you configure the background color for uneven table rows (**Style properties** (on page 297) group/**Tables**):

| Property | Description |
|---|---|
| **Odd rows background color** | Selection of the background color for odd rows in the table from a drop-down list.<br>The list contains all entries of the style group **Colors** (on page 275).<br>Default:: *White smoke* |

## 12.6.2.20 Histogram transparency

With this property, you configure the transparency for a histogram (**Style properties** (on page 297) group/**Histogram**).

| Property | Description |
|---|---|
| **Histogram transparency** | Input of the transparency in percent or selection via arrow keys. |

| Property | Description |
|---|---|
| | ▸ *100*: Full transparency, transparent<br>▸ *0*: No transparency<br>Default:*50 %* |

## 12.6.2.21 Area chart line color

With this property, you configure the line color for area diagrams (**Style properties** (on page 297) group/**Content**).

| Property | Description |
|---|---|
| **Area chart line color** | Selection of the color for the lines in an area chart from a drop-down list. The list contains all entries of the style group **Colors** (on page 275).<br>Default: *Series color 1* |

## 12.6.2.22 Radar chart series border

With this property, you configure the border for net diagram series (**Style properties** (on page 297) group/**Content**).

| Property | Description |
|---|---|
| **Radar chart series border** | Selection of the line style for the border of radar chart series from a drop-down list.<br>The list contains all entries of the style group **Line styles** (on page 281).<br>Default: *Line for radar chart* |

## 12.6.2.23 Chart area background interlace color

With this property, you configure the background of the graphics area in the **Style properties** (on page 297) group.

The background of the chart area is the area that is in the actual chart. The area is limited by axes. The background of the chart area is colored alternately with the background color and the secondary color. Pie charts always have a transparent background in this area.

| Property | Description |
|---|---|
| **Chart area background interlace color** | Selection of the secondary color for the background from a drop-down list.<br>The list contains all entries of the style group **Colors** (on page 275).<br>Default: *White* |

## 12.6.2.24 Radar chart series colors

With this property, you configure the series color for radar charts (**Style properties** (on page 297) group/**Content**).

| Property | Description |
|---|---|
| **Radar chart series colors** | Selection of the color list for the series colors of a radar chart from a drop-down list.<br>The list contains all entries of the style group **Color lists** (on page 288).<br>Default: *Colors for radar charts* |

## 12.6.2.25 Box plot box fill transparency

With this property, you configure the transparency for boxplot fills (**Style properties** (on page 297) group/**Boxplot**).

| Property | Description |
|---|---|
| **Box plot box fill transparency** | Entry of the transparency in percent by means of direct entry or using the arrow keys of the control element.<br>▸ *100*: Full transparency, transparent<br>▸ *0*: No transparency, non-transparent<br>Default:*50 %* |

### 12.6.2.26 Area chart area transparency

With this property, you configure the transparency for the area color of the area diagram (**Style properties** (on page 297) group/**Content**).

| Property | Description |
|---|---|
| **Area chart area transparency** | Entry of the transparency in percent by means of direct entry or using the arrow keys of the control element.<br>▸ *100*: Full transparency, transparent<br>▸ *0*: No transparency, non-transparent<br>Default:*71 %* |

### 12.6.2.27 Radar chart series transparency

With this property, you configure the transparency for radar chart series colors (**Style properties** (on page 297) group/**Content**).

| Property | Description |
|---|---|
| **Radar chart series transparency** | Entry of the transparency in percent by means of direct entry or using the arrow keys of the control element.<br>▸ *100*: Full transparency, transparent<br>▸ *0*: No transparency, non-transparent<br>Default:*55 %* |

### 12.6.2.28 Transparency for trend with limit

With this property, you configure the transparency for a trend with limits (**Style properties** (on page 297)/**Trend with Limits**).

| Property | Description |
|---|---|
| **Transparency for trend with limits** | Entry of the transparency in percent by means of direct entry or using the arrow keys of the control element.<br>▸ *100*: Full transparency, transparent<br>▸ *0*: No transparency, non-transparent<br>Default:*70 %* |

## 12.6.2.29 Gradient color

With this property, you configure the primary color that is used for color gradients.

| Property | Description |
|---|---|
| **Gradient color** | Selection of the color for the primary gradient color from a drop-down list. The list contains all entries of the style group Colors (on page 275).<br><br>Default: *Gainsboro* |

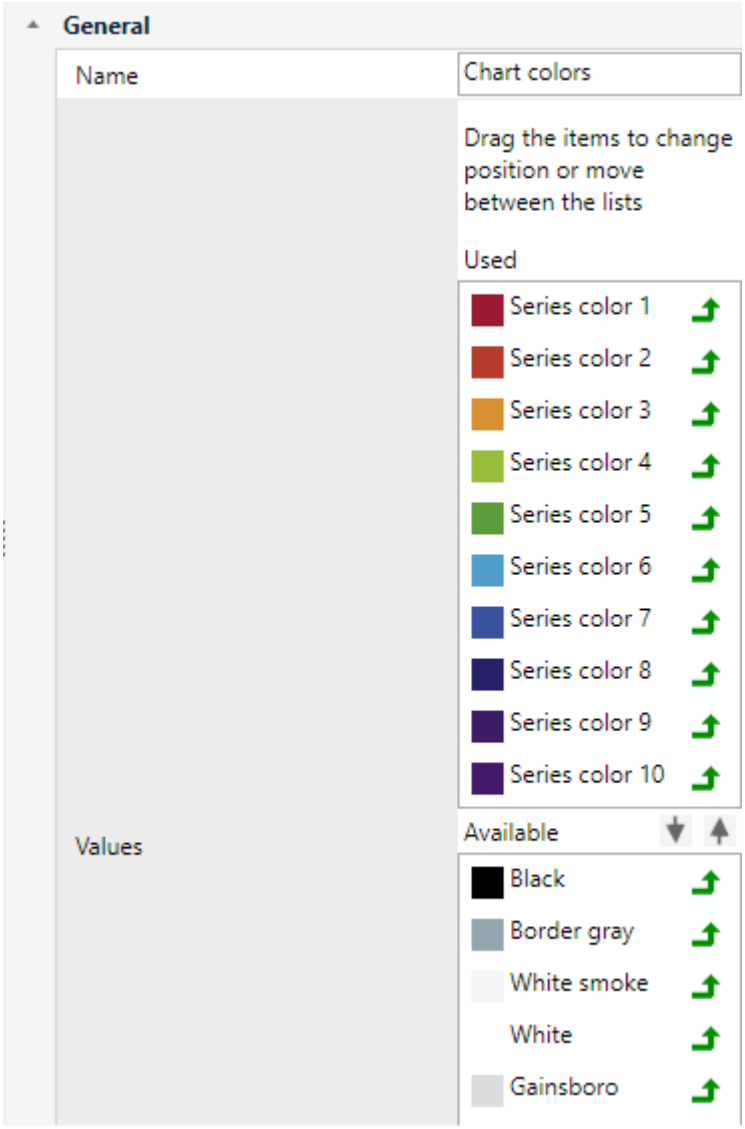
## 12.6.2.30 Secondary gradient color

With this property, you configure the secondary color that is used for color gradients.

| Property | Description |
|---|---|
| **Secondary gradient color** | Selection of the color for the secondary gradient color from a drop-down list. The list contains all entries of the style group Colors (on page 275).<br><br>Default: *White* |

## 12.6.2.31 Values

You use this property to configure the **Color lists** (on page 288) elements. It contains the colors that are available for configuration.




### CONFIGURATION

The lists consist of two areas:

- Lists at the top: Contains all selected entries. These are used for display in <REPORTLAUNCHER>. This list must contain at least one entry.
- Bottom of list: Contains the entries that are available but have not yet been selected.

**Move and arrange entries**

- The entries can be moved between the two lists by dragging&dropping or using the arrow symbols.
- The sequence in a list can be amended using drag&drop.

## 12.6.3 Lines

Properties for the configuration of lines.

### 12.6.3.1 Scale break spacing

With this property, you configure the distance between the scaling lines (**Style properties** (on page 297) group).

| Property | Description |
|---|---|
| **Scale break spacing** | Setting of the distance between the two lines that mark a break. Entry of the distance in percent.<br>Input is possible in levels with a precision of *0.5*.<br>- Minimum: *1,0*<br>- Maximum: *10,0*<br>Default:*2,0* |

#### NOTE: DISPLAY OF THE VALUES OF THE SCALE SPACING IN THE PDF WITH SQL SERVER 2016

For the PDF rendering engine of the SQL server 2016 reporting services, problems with the validation of values entered have been reported for certain values for the scale break spacing. If values different to the standard scheme are to be entered, the following procedure is recommended:

1. Always change only one value at a time.
2. Then confirm the dialog with **OK**.
3. Prepare a report with a chart as a test.
4. Execute the report and export as a PDF file.
5. If the chart is not displayed in the PDF file with the report, the currently-changed value is not correctly recognized. Correct the value and test it again.

### 12.6.3.2 Body cell border

With this property, you configure the border for data cells (**Style properties** (on page 297) group/**Tables**):

| Property | Description |
|---|---|
| **Body cell border** | Selection of the border of data cells from a drop-down list.<br>The list contains all entries of the style group **Border styles** (on page 284).<br><br>Default: *Table cell border* |

### 12.6.3.3 Average line for trend with limit

With this property, you configure the average line for a trend with limits (**Style properties** (on page 297) group/**Trend with Limits**).

| Property | Description |
|---|---|
| **Average line for trend with limits** | Selection of line type from drop-down list.<br>The list contains all entries of the style group **Line styles** (on page 281).<br><br>Default: *Line for average* |

### 12.6.3.4 Data label box

With this property, you configure the frame for the data recording field (**Style properties** (on page 297) group/**Labels**):

| Property | Description |
|---|---|
| **Data label box** | Selection of the border for the data label field from a drop-down list.<br>The list contains all entries of the style group **Border styles** (on page 284).<br><br>Default: *Border for data label* |

### 12.6.3.5 Error line for trend with limit

With this property, you configure the error line for a trend with limits (**Style properties** (on page 297) group/**Trend with Limits**).

| Property | Description |
|---|---|
| **Error line for trend with limits** | Selection of line type from drop-down list.<br>The list contains all entries of the style group **Line styles** (on page 281).<br><br>Default: *Error line* |

### 12.6.3.6 Footer line

With this property, you configure the line of the **footers** in the **Style properties** (on page 297) group.

| Property | Description |
|---|---|
| **Footer line** | Selection of line type from drop-down list.<br>The list contains all entries of the style group **Line styles** (on page 281).<br>Default: *Footer line* |

### 12.6.3.7 Bell curve line width

With this property, you configure the line width for a bell curve in a histogram (**Style properties** (on page 297) group/**Histogram**).

| Property | Description |
|---|---|
| **Bell curve line width** | Entry of the width in *pt* in the field.<br>▸ Minimum: *1*<br>▸ Maximum: *100*<br>Default:*1 pt* |

### 12.6.3.8 Bell curve line style

With this property, you configure the line style for a bell curve in a histogram (**Style properties** (on page 297) group/**Histogram**).

| Property | Description |
|---|---|
| **Bell curve line style** | Selection of the line style from the drop-down list.<br>The list contains all entries of the style group **Line styles** (on page 281).<br>Default: *Solid* |

### 12.6.3.9 Chart axis line

With this property, you configure the line of the graphics axis in the **Style properties** (on page 297) group.

| Property | Description |
|---|---|
| **Chart axis line** | Selection of the line style for the axes from a drop-down list.<br>The list contains all entries of the style group **Line styles** (on page 281).<br><br>Default: *Chart axis line* |

### 12.6.3.10 Lines

With this property, you configure the lines with markers in the **Style list for line with marker** (on page 294) group.

| Property | Description |
|---|---|
| **Lines** | Selection of the lines from the **Available** list and positioning in the **Used** list by means of drag&drop.<br><br>The list contains all entries of the style group **Marker styles** (on page 290).<br><br>Default: *All used* |

#### CONFIGURATION

The lists consist of two areas:

- Lists at the top: Contains all selected entries. These are used for display in <REPORTLAUNCHER>. This list must contain at least one entry.
- Bottom of list: Contains the entries that are available but have not yet been selected.

**Move and arrange entries**

- The entries can be moved between the two lists by dragging&dropping or using the arrow symbols.
- The sequence in a list can be amended using drag&drop.

### 12.6.3.11Lines for trend with limit

With this property, you configure the lines for a trend with limits (**Style properties** (on page 297) group/**Trend with Limits**).

| Property | Description |
|---|---|
| **Lines for trend with limits** | Selection of line type from drop-down list.<br>The list contains all entries of the style group **Line styles** (on page 281).<br><br>Default: *Trend line with marker* |

### 12.6.3.12 Line style

With this property, you configure different lines in the **Line styles** (on page 281) group.

| Property | Description |
|---|---|
| **Line style** | Selection of the line style from the drop-down list.<br>The following styles are available:<br>▸ *None*<br>▸ *Solid*<br>▸ *Dashed*<br>▸ *Dotted*<br>▸ *Dash dot*<br>▸ *Dash dot dot*<br><br>Default: *Solid* |

### 12.6.3.13 Line width

With this property, you configure the thickness of the lines in the **Line styles** (on page 281) group.

| Property | Description |
|---|---|
| **Line width** | Setting of the line width in pt.<br>Input in the field or by means of arrow keys in *0.5* steps.<br>▸ Minimum: *1*<br>▸ Maximum: *100*<br><br>Default: *1.5* |

### 12.6.3.14 Grid lines

With this property, you configure the grid in the **drawing area** in the **Style properties** (on page 297) group.

| Property | Description |
|---|---|
| **Grid lines** | Selection of the style for grid lines from a drop-down list.<br>The list contains all entries of the style group **Line styles** (on page 281).<br><br>Default: *Line for diagram window* |

### 12.6.3.15 Parameter box

With this parameter, you configure the display of the **parameter output area** in the **Style properties** (on page 297) group.

| Property | Description |
|---|---|
| **Parameter box** | Selection of the border for the parameter field from a drop-down list.<br>The list contains all entries of the style group **Border styles** (on page 284).<br><br>Default: *Parameter box border* |

### 12.6.3.16 Border style

With this property, you configure the different display of lines and borders in the **Border styles** (on page 284) group.

| Property | Description |
|---|---|
| **Border style** | Selection of the border style from the drop-down list.<br>The following values are available:<br>▸ *None*<br>▸ *Solid*<br>▸ *Double*<br>▸ *Dashed*<br>▸ *Dotted*<br><br>Default: *Solid* |

### 12.6.3.17 Border width

With this property, you configure the thickness of the border lines in the **Border styles** (on page 284) group.

| Property | Description |
|---|---|
| **Border width** | Setting of the line width in pt.<br>Input in the field or by means of arrow keys in *0.5* steps.<br>▸ Minimum: *1*<br>▸ Maximum: *100*<br>Default: *1.0* |

### 12.6.3.18 Scale break line

With this property, you configure the scale break line of the **Style properties** (on page 297) group.

| Property | Description |
|---|---|
| **Chart axis scale break line** | Selection of the style for the line of the scale break line from a drop-down list.<br>The list contains all entries of the style group **Line styles** (on page 281).<br>Default: *Scale break line* |

### 12.6.3.19 Statistical indicator line width

With this property, you configure the line width of the line for the statistical indicator in a histogram (**Style properties** (on page 297) group/**Histogram**).

| Property | Description |
|---|---|
| **Statistical indicator line width** | Entry of the width in *pt* in the field.<br>▸ Minimum: *1*<br>▸ Maximum: *100*<br>Default:*1 pt* |

### 12.6.3.20 Statistical indicator line style

With this property, you configure the line style for the statistical indicator in a histogram (**Style properties** (on page 297) group/**Histogram**).

| Property | Description |
|---|---|
| **Statistical indicator line style** | Selection of the line style from the drop-down list.<br>The list contains all entries of the style group **Line styles** (on page 281).<br>Default: *Dashed* |

### 12.6.3.21 Header cell border

With this property, you configure the border of the cell with the heading (**Style properties** (on page 297) group/**Tables**).

| Property | Description |
|---|---|
| **Header cell border** | Selection of the border for headers from a drop-down list.<br>The list contains all entries of the style group **Border styles** (on page 284).<br>Default: *Table header border* |

### 12.6.3.22 Warning line for trend with limit

With this property, you configure the warning line for a trend with limits (**Style properties** (on page 297) group/**Trend with Limit**).

| Property | Description |
|---|---|
| **Warning line for trend with limits** | Selection of line type from drop-down list.<br>The list contains all entries of the style group **Line styles** (on page 281).<br><br>Default: *Warning line* |

## 12.6.4 Marker

Properties for the configuration of markers.

> **Attention**
>
> Please note the following when applying styles:
>
> - When drawing markings in diagrams, the frame style of the markings is ignored by the SQL Server Reporting Services.
> - With the trend line and border style, a line style is always only applied between 2 neighboring points. If the points are too close to one another, this can create the impression of a solid line. The correct style is always applied for keys, however

### 12.6.4.1 Box plot marker

With this property, you configure the boxplot markers (**Style properties** (on page 297) group/**Boxplot**).

| Property | Description |
|---|---|
| **Box plot marker** | Selection of the marker from a drop-down list.<br>The list contains all entries of the style group **Marker styles** (on page 290).<br><br>Default: *Box plot marker* |

### 12.6.4.2 Chart marker

With this property, you configure markers for diagrams (**Style properties** (on page 297) group/**Labels**):

| Property | Description |
|---|---|
| **Chart marker** | Selection of the marker for diagrams from a drop-down list.<br>The list contains all entries of the style group **Marker styles** (on page 290).<br><br>Default: *Chart marker* |

### 12.6.4.3 Line style

With this property, you configure the display of lines for markers in the **Style for line with marker** (on page 292) group.

| Property | Description |
|---|---|
| **Marker line** | Selection of the line style from the drop-down list.<br>The following styles are available:<br>▸ *Footer line*<br>▸ *Grid chart line*<br>▸ *Chart axis line*<br>▸ *Scale break line*<br>▸ *Line for radar chart*<br>▸ *Error line*<br>▸ *Warning line*<br>▸ *Average line*<br>▸ *Trend line 1*<br>▸ *Trend line 2*<br>▸ *Trend line 3*<br>▸ *Trend line 4*<br>▸ *Trend line 5*<br>▸ *Trend line 6*<br>▸ *Trend line 7*<br><br>Default: *Trend line 1* |

### 12.6.4.4 Marker style

With this property, you configure the style of a marker in the **Style for line with marker** (on page 292) group.

| Property | Description |
|---|---|
| **Marker style** | Selection of the marker for trend lines from a drop-down list.<br>The list contains all entries of the style group **Marker styles** (on page 290). |

### 12.6.4.5 Marker size

With this property, you configure the size of markers in the **Marker styles** (on page 290) group.

| Property | Description |
|---|---|
| **Marker size** | Configuration of the size of the marker.<br>Direct entry using arrow keys in *0.25 pt* steps:<br>▸ Minimum: *1*<br>▸ Maximum: *100*<br>Default: *3.75 pt* |

### 12.6.4.6 Marker style

With this property, you configure the style for markers in the **Marker styles** (on page 290) group.

| Property | Description |
|---|---|
| **Marker style** | Selection of the style for the display of markers from a drop-down list:<br>▸ *Square*<br>▸ *Circle*<br>▸ *Diamond*<br>▸ *Triangle*<br>▸ *Cross*<br>▸ *Star 4*<br>▸ *Star 5* |

| Property | Description |
|---|---|
| | ▸ *Star 6*<br>▸ *Star 10* |

## 12.6.5 Column pattern style

With this property, you configure the appearance of columns in the **Series Style** group.

| Property | Description |
|---|---|
| **Column pattern style** | Selection of the fill model for the column displays from a drop-down list:<br>▸ None<br>▸ Backward diagonal<br>▸ Cross<br>▸ Dark downward diagonal<br>▸ Dark horizontal<br>▸ Dark upward diagonal<br>▸ Dark vertical<br>▸ Dashed downward diagonal<br>▸ Dashed horizontal<br>▸ Dashed upward diagonal<br>▸ Dashed vertical<br>▸ Diagonal brick<br>▸ Diagonal cross<br>▸ Divot<br>▸ Dotted diamond<br>▸ Dotted grid<br>▸ Forward diagonal<br>▸ Horizontal<br>▸ Horizontal brick<br>▸ Large checker board<br>▸ Large confetti<br>▸ Large grid |

| Property | Description |
| --- | --- |
| | ▸ Light downward diagonal<br>▸ Light horizontal<br>▸ Light upward diagonal<br>▸ Light vertical<br>▸ Narrow horizontal<br>▸ Narrow vertical<br>▸ Outlined diamond<br>▸ 5 percent<br>▸ 10 percent<br>▸ 20 percent<br>▸ 25 percent<br>▸ 30 percent<br>▸ 40 percent<br>▸ 50 percent<br>▸ 60 percent<br>▸ 70 percent<br>▸ 80 percent<br>▸ 90 percent<br>▸ Plaid<br>▸ Shingle<br>▸ Small checker board<br>▸ Small confetti<br>▸ Small grid<br>▸ Solid Diamond<br>▸ Sphere<br>▸ Trellis<br>▸ Vertical<br>▸ Wave<br>▸ Weave<br>▸ Wide downward diagonal |

| Property | Description |
|---|---|
| | ▸ Wide upward diagonal<br>▸ Zig zag |

## 12.6.6 Fonts

Properties for the configuration of fonts.

### 12.6.6.1 Axis font

With this property, you configure the font for the axis labeling (**Style properties** (on page 297) group/**Custom Report Elements**) for:

- Gantt Chart
- Efficiency Class Diagram
- Carpet Plot
- Sankey Diagram
- Histogram
- Box Plot
- Trend with Limits

| Property | Description |
|---|---|
| **Axis font** | Selection of the font for the axes from a drop-down list.<br>The list contains all entries of the style group **Font styles** (on page 278).<br><br>Default: *Font for value fields* |

### 12.6.6.2 Body cell font

With this property, you configure the font type for the data cells (**Style properties** (on page 297) group/**Tables**):

| Property | Description |
|---|---|
| **Body cell font** | Selection of the font from a drop-down list.<br>The list contains all entries of the style group **Font styles** (on page 278). |

| Property | Description |
|---|---|
| | Default: *Font for value fields* |

### 12.6.6.3 Efficiency class font

With this property, you configure the font type for efficiency classes (**Style properties** (on page 297) group/**Custom Report Elements**):

| Property | Description |
|---|---|
| **Efficiency class font** | Selection of the font for the efficiency classes from a drop-down list.<br>The list contains all entries of the style group **Font styles** (on page 278).<br><br>Default: *Efficiency class font* |

### 12.6.6.4 Footer font

With this property, you configure the font of the **footer** in the **Style properties** (on page 297) group.

| Property | Description |
|---|---|
| **Footer font** | Selection of the font for the footer from a drop-down list.<br>The list contains all entries of the style group **Font styles** (on page 278).<br><br>Default: *Footer font* |

### 12.6.6.5 Chart axis font

With this property, you configure the font of the **axes** in the **Style properties** (on page 297) group.

| Property | Description |
|---|---|
| **Chart axis font** | Selection of the font for the axes from a drop-down list.<br>The list contains all entries of the style group **Font styles** (on page 278).<br><br>Default: *Font for value fields* |

### 12.6.6.6 Chart legend font

With this property, you configure the font of the key (**Style properties** (on page 297) group/**Labels**):

| Property | Description |
|---|---|
| **Chart legend font** | Selection of the font for the chart key from a drop-down list.<br>The list contains all entries of the style group **Font styles** (on page 278).<br><br>Default: *Font for value fields* |

### 12.6.6.7 Data label font

With this property, you configure the font for data recordings (**Style properties** (on page 297) group/**Labels**):

| Property | Description |
|---|---|
| **Data label font** | Selection of the font for the data label from a drop-down list.<br>The list contains all entries of the style group **Font styles** (on page 278).<br><br>Default: *Font for value fields* |

### 12.6.6.8 Label font

With this property, you configure the font for label fields in the **Text Fields** group.

| Property | Description |
|---|---|
| **Label font** | Selection of the font for labels from a drop-down list.<br>The list contains all entries of the style group **Font styles** (on page 278).<br><br>Default: *Title font* |

### 12.6.6.9 Parameter label font

With this property, you configure the title font for the **parameter output range** (**Style properties** (on page 297) group).

| Property | Description |
|---|---|
| **Parameter label** | Selection of the font for parameter labels from drop-down list. |

| Property | Description |
|---|---|
| **font** | The list contains all entries of the style group **Font styles** (on page 278).<br><br>Default: *Parameter title font* |

### 12.6.6.10 Parameter value font

With this property, you configure the font for the **parameter output range** in the **Style properties** (on page 297) group.

| Property | Description |
|---|---|
| **Parameter value font** | Selection of the font for parameter value font drop-down list.<br>The list contains all entries of the style group **Font styles** (on page 278).<br><br>Default: *Font for parameter values* |

### 12.6.6.11Report name font

With this property, you configure the font for the report names in the **Style properties** (on page 297) group.

| Property | Description |
|---|---|
| **Report name font** | Selection of the font for the display of the report name from a drop-down list:<br>The list contains all entries of the style group **Font styles** (on page 278).<br><br>Default: *Title font* |

### 12.6.6.12 Value font

With this property, you configure the font for value fields in the **Text Fields** group (**Style properties** (on page 297)).

| Property | Description |
|---|---|
| **Value font** | Selection of the font for value fields from drop-down list.<br>The list contains all entries of the style group **Font styles** (on page 278).<br><br>Default: *Font for value fields* |

### 12.6.6.13 Font

With this property, you configure the available fonts in the **Font styles** (on page 278) group.

| Property | Description |
|---|---|
| **Font family** | Selection of font family from drop-down list or free entry of a font type:<br>▸ Drop-down list:<br>Contains a selection of the font types available on the system.<br>▸ Direct input:<br>Allows the naming of a font type that is present on the Analyzer Server but not available in ZAMS.<br>**Attention:** There is no validation of whether the configured font type is also available on the Analyzer Server. |

### 12.6.6.14 Grouping header font

With this property, you configure the font type for grouping headers (**Style properties** (on page 297) group/**Tables**):

| Property | Description |
|---|---|
| **Grouping header font** | Selection of the font for headers of a grouping from a drop-down list. The list contains all entries of the style group **Font styles** (on page 278).<br>Default: *Table grouping font* |

### 12.6.6.15 Font size

With the **font size** property, you configure the size of the fonts in the **Font styles** (on page 278) group.

| Property | Description |
|---|---|
| **Font size** | The font size in points is set using the arrow keys or by entering it in the number field.<br>▸ Minimum: *1*<br>▸ Maximum: *100* |

## 12.6.6.16 Font weight

With this property, you configure the boldness of the font in the **Font styles** (on page 278) group.

| Property | Description |
|---|---|
| **Font weight** | Selection of font thickness from drop-down list.<br>The following are available:<br>▸ *Thin*<br>▸ *Extra light*<br>▸ *Light*<br>▸ *Normal*<br>▸ *Medium*<br>▸ *Semi bold*<br>▸ *Bold*<br>▸ *Extra bold*<br>▸ *Heavy* |

## 12.6.6.17 Title font

With this property, you configure the title font (**Style properties** (on page 297) group/**Custom Report Elements**) for:

- Gantt Chart
- Efficiency Class Diagram
- Carpet Plot
- Sankey Diagram
- Histogram
- Box Plot
- Trend with Limits

| Property | Description |
|---|---|
| **Title font** | Selection of the font for the title from a drop-down list.<br>The list contains all entries of the style group **Font styles** (on page 278). |

| Property | Description |
|---|---|
| | Default: *Custom report item title font* |

### 12.6.6.18 Header cell font

With this property, you configure the font type for the table overview (**Style properties** (on page 297) group/**Tables**):

| Property | Description |
|---|---|
| **Header cell font** | Selection of the font for header cells from a drop-down list.<br>The list contains all entries of the style group **Font styles** (on page 278).<br>Default: *Font for table overview* |

## 12.6.7 Statistics

Properties for the configuration of statistics.

### 12.6.7.1 Maximum

With this property, you configure the display of the maximum for a statistic (**Style properties** (on page 297) group/**Statistics**).

| Property | Description |
|---|---|
| **Maximum** | Selection of the display of the maximum from the drop-down list.<br>The list contains all entries of the style group **Series Style**.<br>Default: *Statistic series Maximum* |

### 12.6.7.2 Minimum

With this property, you configure the display of the minimum for a statistic (**Style properties** (on page 297) group/**Statistics**).

| Property | Description |
|---|---|
| **Minimum** | Selection of the display of the minimum from the drop-down list. |

| Property | Description |
|---|---|
| | The list contains all entries of the style group **Series Style**.<br>Default: *Statistic series Minimum* |

### 12.6.7.3 Average

With this property, you configure the display of the average for a statistic (**Style properties** (on page 297) group/**Statistics**).

| Property | Description |
|---|---|
| **Average** | Selection of the display of the average from the drop-down list.<br>The list contains all entries of the style group **Series Style**.<br>Default: *Statistic series Average* |

### 12.6.7.4 Standard deviation

With this property, you configure the display of the standard deviation for a statistic (**Style properties** (on page 297) group/**Statistics**).

| Property | Description |
|---|---|
| **Standard deviation** | Selection of the display of the standard deviation from the drop-down list.<br>The list contains all entries of the style group **Series Style**.<br>Default: *Statistic series Standard deviation* |

### 12.6.7.5 Median

With this property, you configure the display of the median for a statistic (**Style properties** (on page 297) group/**Statistics**).

| Property | Description |
|---|---|
| **Median** | Selection of the display of the median from the drop-down list.<br>The list contains all entries of the style group **Series Style**. |

| Property | Description |
|---|---|
| | Default: *Statistic series Median* |

### 12.6.7.6 Range

With this property, you configure the display of an area for a statistic (**Style properties** (on page 297) group/**Statistics**).

| Property | Description |
|---|---|
| **Range** | Selection of the display of the area from the drop-down list.<br>The list contains all entries of the style group **Series Style**.<br>Default: *Statistic series Range* |

### 12.6.7.7 Cp

With this property, you configure the display of the key figure **Cp** for a statistic (**Style properties** (on page 297) group/**Statistics**).

| Property | Description |
|---|---|
| **Cp** | Selection of the display of the key figure from the drop-down list.<br>The list contains all entries of the style group **Series Style**.<br>Default: *Statistic series Cp* |

### 12.6.7.8 CPO

With this property, you configure the display of the key figure **CPO** for a statistic (**Style properties** (on page 297) group/**Statistics**).

| Property | Description |
|---|---|
| **CPO** | Selection of the display of the key figure from the drop-down list.<br>The list contains all entries of the style group **Series Style**.<br>Default: *Statistic series CPO* |

### 12.6.7.9 CPU

With this property, you configure the display of the key figure **CPU** for a statistic (**Style properties** (on page 297) group/**Statistics**).

| Property | Description |
|---|---|
| **CPU** | Selection of the display of the key figure from the drop-down list.<br>The list contains all entries of the style group **Series Style**.<br>Default: *Statistic series CPU* |

### 12.6.7.10 CPK

With this property, you configure the display of the key figure **CPK** for a statistic (**Style properties** (on page 297) group/**Statistics**).

| Property | Description |
|---|---|
| **CPK** | Selection of the display of the key figure from the drop-down list.<br>The list contains all entries of the style group **Series Style**.<br>Default: *Statistic series CPK* |

## 12.6.8 Predictive

Properties for the configuration of predictions.

### 12.6.8.1 Value

With this property, you configure the display of the value of a prediction (**Style properties** (on page 297) group/**Prediction**).

| Property | Description |
|---|---|
| **Value** | Selection of the display the value from the drop-down list.<br>The list contains all entries of the style group **Series Style**. |

| Property | Description |
|---|---|
| | Default: *Predictive series Value* |

### 12.6.8.2 Predicted value

With this property, you configure the display of the predicted value of a prediction (**Style properties** (on page 297) group/**Prediction**).

| Property | Description |
|---|---|
| **Predicted value** | Selection of the display the value from the drop-down list.<br>The list contains all entries of the style group **Series Style**.<br>Default: *Prediction series predicted value* |

# 13 Clear cache

If metadata has been changed or the data from the report templates has been updated, the cache must be deleted.

The cache is deleted as standard:

- If ZAMS is connected to a different database, the data of which is required, and the data is called up
- ZAMS is restarted

In addition, the deletion of the cache can be triggered manually by: Ribbon **Options -> Cache -> Delete**.
This action emulates objects of a ZAMS restart for the cache manager.

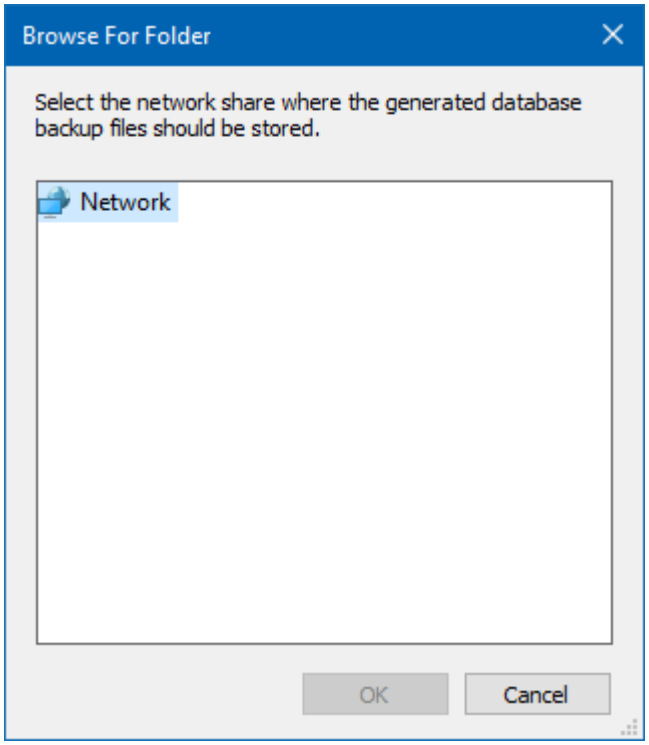
**Note:** This action is available regardless of the connection to the Analyzer server and regardless of whether there is a valid license.
This action is not available if one of the actions **Open**, **Prepare**, **Prepare all**, **Open in Report Builder** or **Open all in Report Builder** are executed.

### Information

This action **Delete cache** only relates to ZAMS and is not identical to the **cache updating** function in the Report Launcher.

# 14 Selection of folder in the network

The dialog to select a network approval is displayed if a folder in the network is selected as a save location for files from ZAMS. The display of the dialog and its content is controlled by the operating system.




| Option | Description |
|---|---|
| **Network display** | Displays the network.<br><br>Clicking on the folder starts a search for computers in the network and shows these. Because it takes some time to list all computers available in the Windows network, the **Network** node can only be opened after some seconds. |
| **OK** | Applies settings and closes the dialog. |
| **Cancel** | Discards all changes and closes the dialog. |

| Option | Description |
|---|---|
| **Network display** | Displays computers present in the network. Clicking on the computer |

| Option | Description |
|---|---|
| | shows approved folders.<br><br>Clicking on the folder highlights this for acceptance as the save location. |
| **OK** | Applies settings and closes the dialog. |
| **Cancel** | Discards all changes and closes the dialog. |

The size and position of the dialog can be changed. These settings are saved as user-dependent.

# 15 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 or delete your own languages (on page 356)
- Hide languages
- Add or delete your own key words (on page 358)
- Reset the language table to the standard of the system texts
- Export (on page 362) all or amended entries into an XML file and import from this (on page 362)
- Sorting and filtering (on page 353) entries

You start the language table by means of:

- The **Language table** entry in the **Options** ribbon
  or
- The corresponding symbol in the **select language table key word** (on page 367) dialog for the selection of texts or key words of the properties

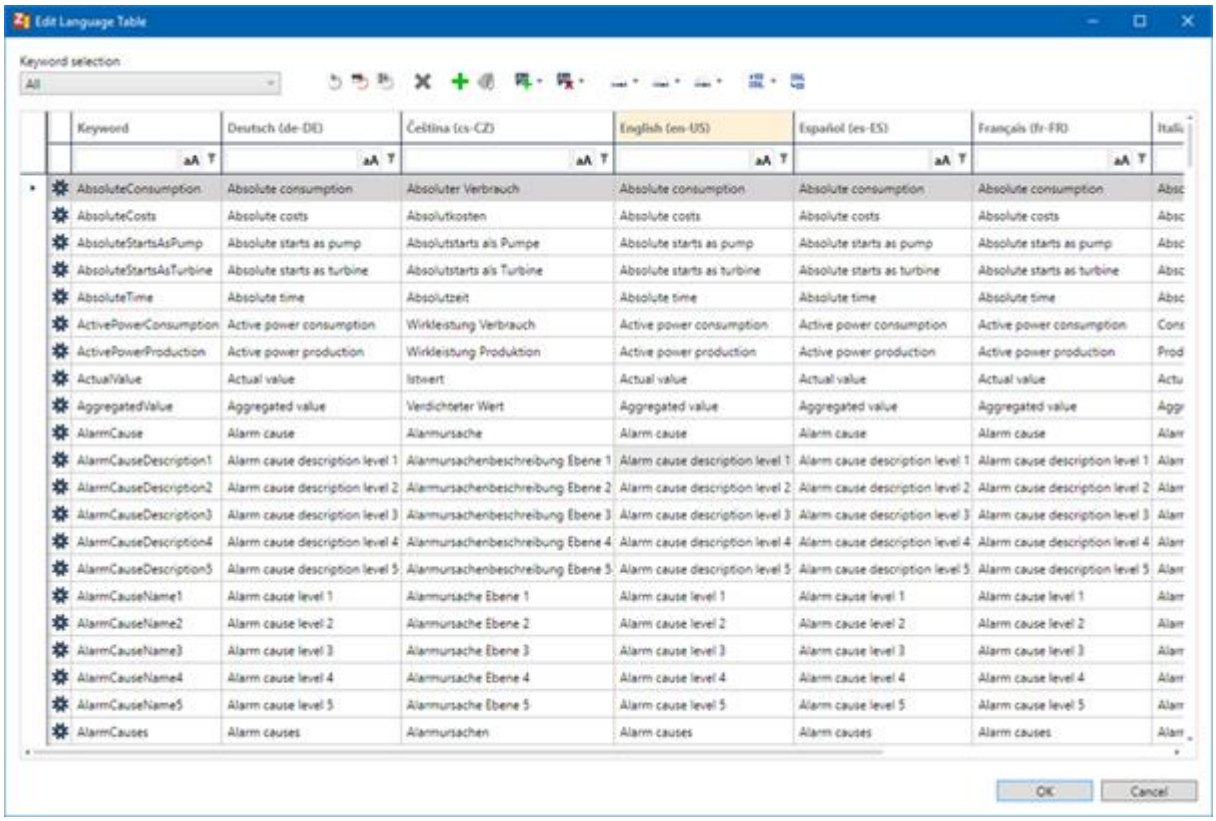
## LANGUAGES

The language tables provides system texts in eight languages:

- Chinese

- German
- English
- French
- Italian
- Russian
- Spanish
- Czech
- Further languages can be added as defined by the user.

## LANGUAGE TABLE DIALOG




| Option | Description |
|---|---|
| **Toolbar** | Contains:<br>▸ Drop-down list to pre-filter (on page 353) which key words are displayed.<br>▸ Symbols (on page 351) for the adding, deleting, editing, exporting and importing of languages and entries.<br><br>**Entries in drop-down list:** |

| Option | Description |
|---|---|
| | ▸ *Changed*:<br>Only shows the system texts amended by the user.<br>▸ *User-defined*:<br>Only shows the key words created by the user.<br>▸ *User-defined and changed*:<br>Only shows key words created by the user and/or amended system texts.<br>▸ *All*:<br>Shows all keywords. |
| **Table** | Display of the key words and the corresponding texts in the system languages and user-defined languages:<br>▸ There is a line for each key word.<br>▸ There is a respective column for each language.<br>▸ Languages that are selected for deployment are highlighted in color. These cannot be deleted or hidden.<br>▸ The first column contains the key word.<br>Key words for system texts cannot be changed. Language entries can be changed.<br>▸ The columns of the language table can be sorted and filtered (on page 353).<br>The symbol in the first column shows the type of entry:<br>▸ **Cog wheel**: system text<br>▸ **Pencil**: individual text<br>Lines are automatically selected for editing if:<br>▸ A new key word has been created<br>▸ A key word has been amended<br>▸ An empty line is discovered |
| **OK** | Validates the input, applies all valid changes and closes the dialog.<br>If errors were found during validation, a notice is shown and the dialog remains open.<br>In order for an entry to be valid:<br>▸ All cells of a line must contain an entry |

| Option | Description |
|---|---|
| | ▸ Each key word can only be used once |
| **Cancel** | Discards all changes and closes the dialog. |

### NAVIGATE IN THE LANGUAGE TABLE

You have several possibilities for navigation in the language table:

- **Tab** key: Jumps one cell to the right. When the end of the line is reached, a switch to the first cell of the next line is made.
  A switch to the left and upwards is made with the **Caps Lock + Tab** keys. It works in view mode and edit mode.
- **Enter key**: Jumps one cell downwards. Only works in edit mode.
- Arrow keys: You navigate through the table with the arrow keys when you are in view mode. The direction of the arrow key denotes the direction of navigation. Each press of the arrow key moves by one cell in the selected direction.
  Further keyboard shortcuts in view mode:
  - **Home**: Jumps to the first cell of the line.
  - **Ctrl+End** key: Jumps to the last cell of the line.
  - **Ctrl+Home** key: Jumps to the first cell of the table.
  - **Ctrl+End** key: Jumps to the last cell of the table.
  - **Page Up**: Jumps one screen page upwards.
  - **Page Down**: Jumps one screen page downwards.

## 15.1 Toolbar

| Symbol | Description |
|---|---|
| **Reset to System Text** | Resets the text for this key word back to the standard text for the selected language without requesting confirmation.<br><br>Only available if a cell with a language for a system text has been selected. |
| **Reset all system texts for this line** | Resets the text for this key word back to the standard text for all languages after requesting confirmation.<br><br>Only available if a cell in a line with a language with a |

| Symbol | Description |
|---|---|
| | system key word has been selected. |
| **Reset all system texts for this language** | Resets the text for all key words back to the standard text for the selected language after requesting confirmation.<br>Only available if a cell with a language for a system text has been selected. |
| **Delete row** | Deletes the selected line after requesting confirmation.<br>Only available if a cell with its own entry has been selected. |
| **New Row** | Opens the dialog (on page 358) to define a key word. If this is closed with OK, a new line with the defined key word is added to the table and the focus is put on this entry. |
| **Change key word** | Opens the dialog (on page 358) to define a key word. If this is closed with OK, the focus is put on this entry.<br>Only available if a cell with its own entry has been selected. |
| **Add language** | Click opens a menu to:<br>▸ Show a hidden language<br>▸ Add a new language |
| **Delete language** | Click opens a menu to:<br>▸ Hide the selected language<br>▸ Delete the selected language |
| **Fill single text from other language** | Applies a text from another language (on page 361) for the selected cell. Clicking opens a list with available languages. |
| **Fill all empty texts from other language** | Fills all empty cells of the selected language with text from another language (on page 361). Clicking opens a list with available languages. |
| **Fill all texts from other language** | Fills all cells of the selected language with text from another language (on page 361). Clicking opens a list with available languages. |
| **XML export** | Opens the dialog (on page 362) to export entries into an XML file. |

| Symbol | Description |
|---|---|
| **XML import** | Opens the dialog (on page 362) to import entries from an XML file. |

## 15.2 Filtering and sorting

The entries can be shown as sorted and filtered.

### SORT

To sort the table:

1. Click in the header of the column according to which sorting is to take place.
2. Click again to change the sorting.

   Three sorting processes are gone through in sequence:

   - *Ascending*: The list is sorted from *0 - 9* and from *a - z*.
     Display with arrow pointing upwards.
   - *Descending*: The list is sorted from *9 - 0* and from *z - a*
     Display by the arrow upwards.
   - *Unsorted*: The list is displayed in the original status, i.e. as it was created.

### FILTER

The entries to be displayed can be filtered using:

- **Selection of key words** drop-down list
- Filter in the table

#### PRE-FILTERING USING THE DROP-DOWN LIST

To pre-filter the entries to be displayed, select the desired view using the **Selection of key words** drop-down list:

- *Changed:*
  Only shows the system texts amended by the user.
- *User-defined*:
  Only shows the key words created by the user.
- *User-defined and changed*:
  Only shows key words created by the user and/or amended system texts.

- *All*:
  Shows all keywords.

Note: If *Amended* is selected and a new user-defined key word is added, the filter is automatically set to *User-defined and amended*.

### FILTERING IN THE TABLE

You can use the filter in the table to search for specific entries or exclude them.
The filters of the individual columns can be combined with one another.

**To filter:**

1. Click in the header in the filter field of the desired column.
2. Enter the filter term.
   Filtering is carried out with the *Contains* filter criteria by default.
3. To change the filter criteria, click on the filter symbol next to the filter field.
   The list of filter criteria is opened.
4. Select the desired filter criteria.

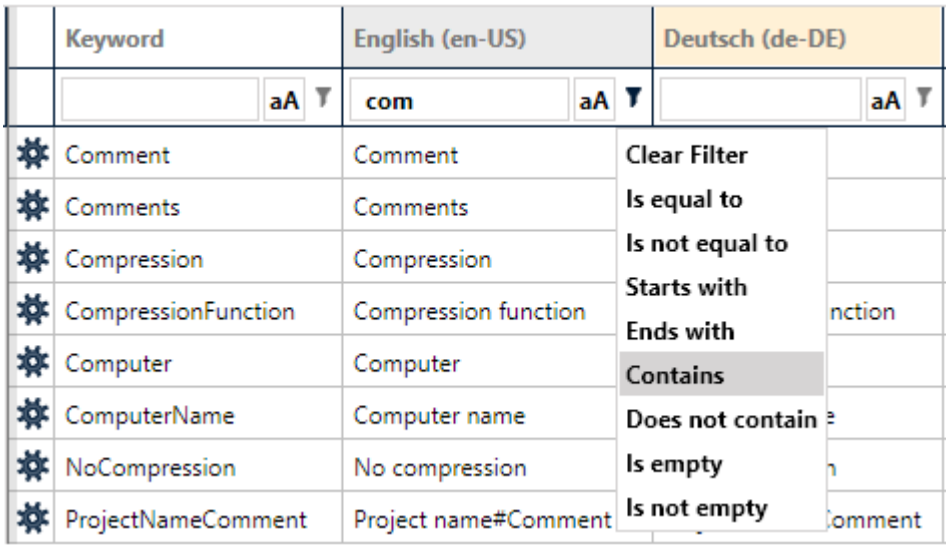
   The filter is applied as soon as you leave the filter field or press the **Enter key**.

**To remove a filter:**

1. Click on the the filter symbol of the desired column.
   The list of filter criteria is opened.
2. Click on the **Remove filter** button.
   The filter for this column is thus removed. Filters in other columns continue to be applied.

   Alternative: Delete the entry in the filter field and leave the input field or press the **Enter key**.

## FILTER DIALOG




| Option | Description |
|---|---|
| **Input field** | Entry of the character sequence that is to be filtered for. |
| **aA** | Switches between:<br>▸ *Capitalization is not taken into account*<br>▸ *Capitalization is taken into account*<br>Default: *Capitalization is not taken into account* |
| **Symbol filter** | Clicking on the filter symbol opens a list to select a filter criterion.<br>Default: *Contains* |

### FILTER CRITERIA

The following are available as criteria for filter expressions:

| Criterion | Description |
|---|---|
| *Remove filter* | Removes all filter criteria. All lines are displayed again. |
| *Is the same as* | All entries with precisely the character sequence entered are displayed. |
| *Is not the same as* | All entries that do not precisely correspond to the character sequence entered are displayed. |
| *Starts with* | All entries that start with the character sequence are displayed. |

| Criterion | Description |
|---|---|
| *Ends with* | All entries that end with the character sequence are displayed. |
| *Contains* | All entries that contain this character sequence are displayed. (Default setting.) |
| *Does not contain* | All entries that do not contain this character sequence are displayed. |
| *is empty* | All empty entries are displayed.<br>**Note:** Language tables must not contain empty cells for existing key words. |
| *is not empty* | All entries that contain at least one character are displayed. Spaces are also considered characters. |

## 15.3 Add or remove languages

Further languages can be added to the existing language systems or deleted from them; languages can also be hidden and shown. System languages can be hidden, but not deleted.

### ADD LANGUAGE

To add a user-defined language:

1. Click on the symbol for **Add new language**.

   The drop-down list is opened.
2. In the drop-down list click on the symbol for **Add new language**.

   The dialog (on page 357) to select a new language is opened.
3. Select the desired language.
4. If necessary, select the language from which the text is to be transferred.
5. Click on **OK**.

   The language is added in the column to the right of the key words.

### DELETE LANGUAGE

To delete a user-defined language:

1. Select the column with the language to be deleted.
2. Click on the symbol for **Delete language**:

The drop-down list is opened.

3. In the drop-down list click on the symbol for **Delete language**:

   The language is deleted after confirmation is requested.

**Note**: The following cannot be deleted:

- System languages
- Languages that have been selected for deployment (on page 47)

### HIDE LANGUAGE

To hide a language:

1. Click in the column with the language that is to be hidden.
2. Click on the symbol for **Delete language**:

   The drop-down list is opened.
3. Click on the symbol for **Hide language**.

   The language is hidden.

**Note:** Hidden languages are not available for deployment. A language that has been selected for deployment (on page 47) cannot be hidden.

### HIDE LANGUAGE

To show a language that has been hidden again:

1. Click on the symbol for **Add new language**.

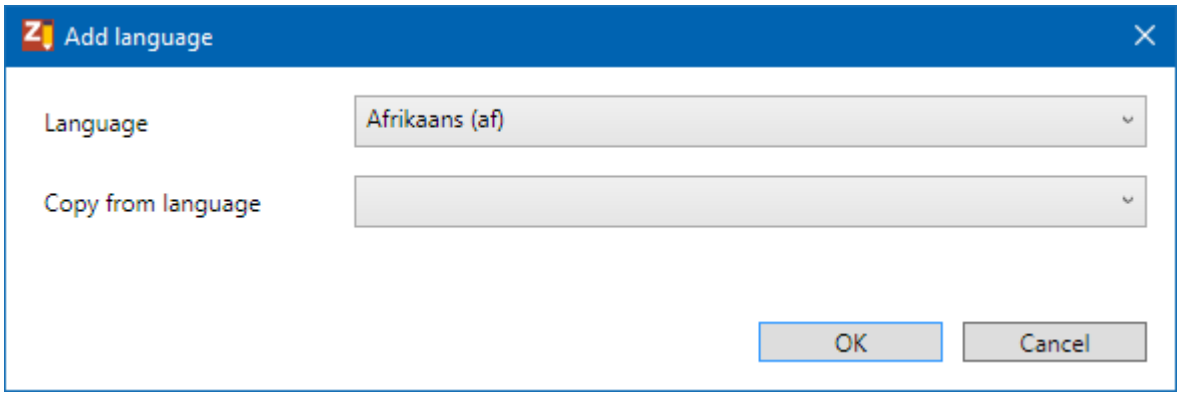
   The drop-down list is opened. All hidden languages are displayed.
2. Click on the desired language.

   The language is shown on the right next to the **Key Word** column.

## 15.3.1 Add new language dialog

New languages are added using a dialog.

### DIALOG




| Option | Description |
|---|---|
| **Language** | Selection of desired language from drop-down list. |
| **Copy from language** | Selection of an existing language from drop-down list. Applies all entries from the selected language in the newly-created language. |

### CLOSE DIALOG

| Option | Description |
|---|---|
| **OK** | Applies settings and closes the dialog. |
| **Cancel** | Discards all changes and closes the dialog. |

## 15.4 Edit key words and entries

Entries in the language table can be edited, newly created or deleted.

### NEW KEY WORD

New individual key words can be created.
To create a new key word:

1. In the tool bar, click on the symbol for a new entry (the **star**).

   The dialog (on page 361) to define a key word is opened.

2. Enter the desired key word.

**Note:** The key word must only appear in the language table once and must only contain valid characters.
All alphanumeric characters are valid.

3. Confirm the entry by clicking on **OK**.
   - The key word is entered in a new, empty line.
   - All existing columns are filled with the key word.
   - The focus is set to this line.
4. Replace the key word in the relevant languages with the respective translation.

   **Note:** The language table can only be ended with **OK** if all cells contain an entry. This also applies to XML export and XML import.

## EDIT ENTRIES

All language entries and all individual key words can be edited.

### AMEND LANGUAGE ENTRY

To amend a language entry:

1. Click on the desired entry.

   The cell for editing is opened
2. Amend the entry.
3. To apply the change:
   Press the **Tab** key, press the **Enter** key or click in another cell.

   The change is applied

### CHANGE KEY WORD

Individual key words can be amended. Key words for system texts cannot be amended.
To edit an individual key word:

1. Select the line with the desired key word.
2. In the tool bar, click on the symbol for **Change key word** (**sticker**).

   The dialog (on page 361) for defining a keyword is opened. The current key word is entered in the input field.
3. Enter the new key word.

   **Note:** The key word must only appear in the language table once and must only contain valid characters.
   All alphanumeric characters are valid.

4. Confirm the entry by clicking on **OK**.

   The key word is amended and the focus is put on this line.

## DELETE ENTRY

Individual entries can be deleted.
To delete a language entry:

1. highlight the desired line.
2. Click on the symbol to be deleted (**X**).
3. Confirm this when requested to do so.

   The key word is deleted together with all attendant translations.

## RESET TO SYSTEM TEXTS

Amended language entries can be reset to the standard system texts. Resetting can be carried out for:

- A key word of a language (one cell)
- A key word (one line)
- A language (one column)

**To reset a language entry for a key word:**

1. Highlight the desired cell by clicking on it.
2. Click on the **Reset system text** symbol (1st symbol on the left).

   The entry is reset without requesting confirmation.

**To reset all language entries for a key word:**

1. Highlight the desired cell by clicking in a cell of this key word.
2. Click on the symbol for **Reset all system texts for this line** (2nd symbol on the left).
3. Confirm this when requested to do so.

   All language entries for the key word are reset to the default value.

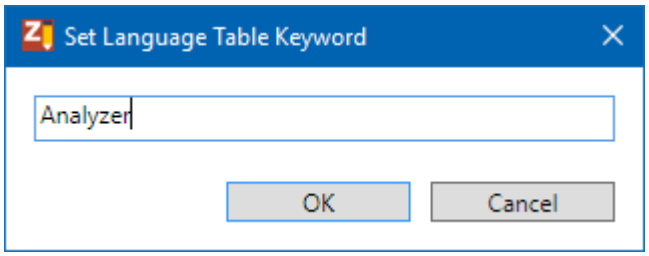
**To reset all key words for a language:**

1. Highlight the desired language by clicking in a cell of this language.
2. Click on the symbol to **Reset all system texts for this language** (3rd symbol on the left).
3. Confirm this when requested to do so.

   All entries in this language are reset to the default value.

### 15.4.1 Input dialog for the key word

This dialog is opened in order to create new key words or to amend existing words.
**Note:** Key words for system text cannot be changed.




| Option | Description |
|---|---|
| **Input field** | Entry of the key word.<br>The default value depends on the context:<br>▸ Creation of a new key word: empty<br>▸ Changing an existing key word: current key word<br>The input field is validated after each change. Each validation error leads to the OK button being deactivated. Validation criteria:<br>▸ The input field must not be empty.<br>▸ Only alphanumeric characters can be entered.<br>▸ The text is not used by any other language table entry<br>Validation errors are shown as a tool tip for the input field. |
| **OK** | Applies settings and closes the dialog.<br>Only available if the entry has been positively validated. |
| **Cancel** | Discards all changes and closes the dialog. |

## 15.5 Apply entries

Entries for languages can be applied by other languages.
Possibilities for text transfer:

- Fill single text from other language
- Fill all empty texts from other language
- Fill all texts from other language

### FILL SINGLE TEXT FROM OTHER LANGUAGE

To transfer an individual text from one language to another:

1. Select the field in the target language.
2. Click on the symbol for **Fill individual text from another language**.

   the list of the available languages is displayed.
3. Select the desired language.

   The entry in the target language is replaced with the entry in the selected language.

### FILL ALL EMPTY TEXTS FROM OTHER LANGUAGE

To fill all empty fields with texts in another language:

1. Select the target language.
2. Click on the symbol for **Fill all empty texts with another language**.

   the list of the available languages is displayed.
3. Select the desired language.

   All empty fields in the target language are replaced by the entries of the selected languages after a request for confirmation.

### FILL ALL TEXTS FROM OTHER LANGUAGE

To fill all fields with texts in another language:

1. Select the target language.
2. Click on the symbol for **Apply texts from another language**.

   the list of the available languages is displayed.
3. Select the desired language.

   All fields in the target language are replaced by the entries of the selected languages after a request for confirmation.

## 15.6 XML export and XML import

Entries in the language table can be exported as an XML file or imported from an XML file.

## EXPORT LANGUAGE TABLES

The language table can be exported to an XML file.
During export, a distinction can be made between:

- all entries
- Amended entries only
  Changes are always understood as a difference to fixed, defined system text. It thus does not relate to entries that have already been exported.

To export entries:

1. Click on the **XML export** symbol in the tool bar.

   The drop-down list is opened.

2. Select the type of export:

   - **Export only changes as XML**
   - **Export all as XML**

   The dialog for the configuration of the export is opened.
   If there are no texts for export, an error message is shown.

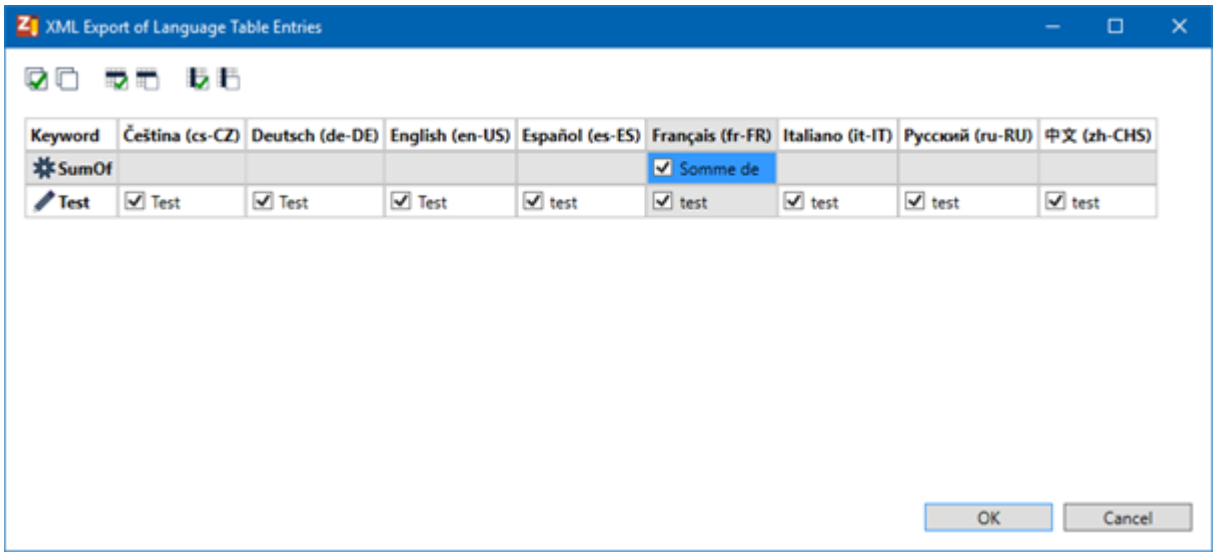
3. Select the desired entries for the export.
   Selection is made by activating/deactivating the check box in front of the entry. All entries are preselected by default.
   You can activate all checkboxes of a line or column, or the complete table, by activating or deactivating the tool bar.

4. Click on **OK**.
   The dialog to issue a file name is opened.

5. Select a save location and a file name.

6. Click on **OK**.
   The entries are exported after successful validation.
   **Note**: For successful validation, each cell must have content and each key word must be unique.

## XML EXPORT DIALOG




| Option | Description |
|---|---|
| **Toolbar** | Symbols for the configuration of element selection.<br>From left to right:<br>▸ Select all texts<br>▸ Deselect all texts<br>▸ Select all texts for this line<br>▸ Clear the selection of the texts for this line<br>▸ Select all texts for the highlighted language<br>▸ Clear selection of the texts for the selected language |
| **List of entries** | Shows a list of entries that can be exported. The entries that are actually to be exported are selected by means of the check boxes in front of the entries.<br>▸ Line 1: Language definition. Cannot be edited. All other lines show key words and language entries.<br>There is one line per amended entry in the language table. If the text assigned to the key word has not been changed, the respective cell remains empty.<br>▸ Column 1: Key word and symbol for system entries (cog wheel) and individual entries (pen).<br>A separate column is shown for each language that has had changes made.<br>Checkbox: |

| Option | Description |
|---|---|
| | ▸ *Checked*: is exported<br>▸ *empty*: is not exported<br>Selection can also be by means of the symbols in the tool bar.<br>This table cannot be sorted or filtered. |
| **OK** | Applies configuration, closes the configuration dialog, opens the dialog to select a file name and exports the entries.<br>Only available if at least one checkbox has been activated. |
| **Cancel** | Discards all configurations and closes the dialog. |

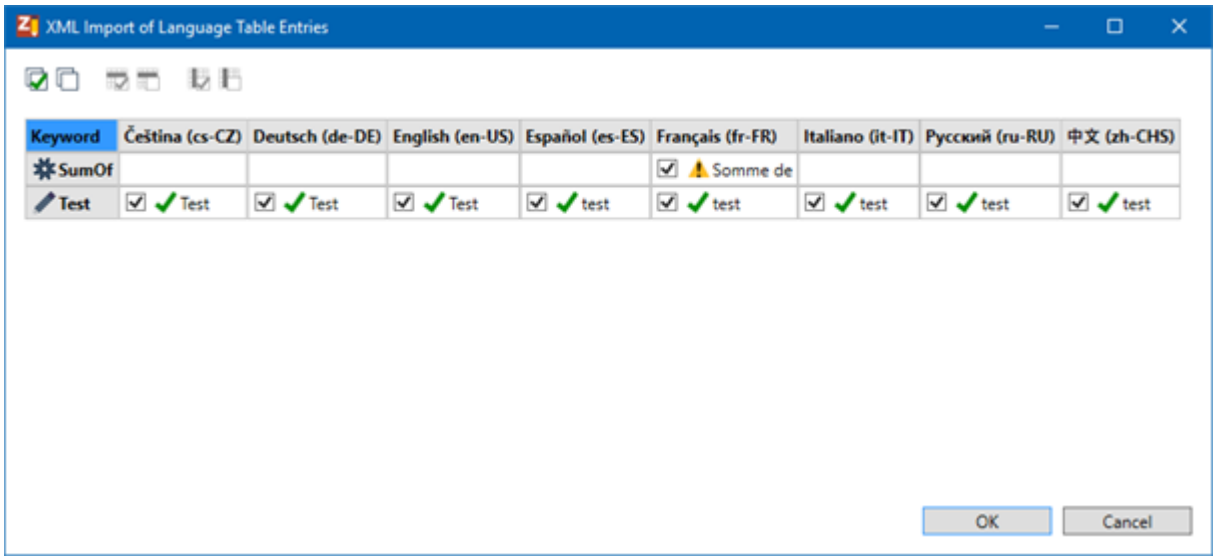
## IMPORTING LANGUAGE TABLE

Individual key words and entries for language tables can be imported from an XML file.

To import entries:

1. Click on the **XML import** symbol in the tool bar.
   The dialog to select an XML file is opened.
2. Select the desired file.
   The dialog for the configuration of an import is opened.
3. Select the entries for the import.
   Selection is made by activating/deactivating the check box in front of the entry. All entries are preselected by default.
   You can activate all checkboxes of a line or column, or the complete table, by activating or deactivating the tool bar.
   If there are conflicts for entries that are already present, these are displayed by a warning symbol. Imported entries overwrite pre-existing entries in the event of conflicts.
4. Click on **OK**.
   The entries are imported after successful validation of the file.
   **Note**: For successful validation, each cell must have content and each key word must be unique. Languages hidden before import remain hidden. Only the newly-imported language is additionally added.

## XML IMPORT DIALOG




| Option | Description |
|---|---|
| **Toolbar** | Symbols for the configuration of element selection.<br>From left to right:<br>▸ **Select all texts**<br>▸ **Deselect all texts**<br>▸ **Select all texts for this line**<br>▸ **Clear the selection of the texts for this line**<br>▸ **Select all texts for the highlighted language**<br>▸ **Clear selection of the texts for the selected language** |
| **List of entries** | Shows list of entries that can be imported. The entries that are actually to be imported are selected by means of the check boxes in front of the entries.<br>▸ Line 1: Language definition. Cannot be edited. All other lines show key words and language entries. There is one line per importable entry in the language table.<br>▸ Column 1: Key word and symbol for system entries (cog wheel) and individual entries (pen). A separate column is shown for each language for which there are importable entries.<br>▸ If there is already an entry in the table, it is shown by a warning symbol (yellow triangle with exclamation mark). Imported entries overwrite pre-existing entries. |

| Option | Description |
|---|---|
| | Checkbox:<br>▸ *active*: is exported<br>▸ *inactive*: is not exported<br>Selection can also be by means of the symbols in the tool bar.<br>This table cannot be sorted or filtered. |
| **OK** | Applies configuration, closes the configuration dialog and imports the entries.<br>Only available if at least one checkbox has been activated. |
| **Cancel** | Discards all configurations and closes the dialog. |

## 15.7 Selection of key word from language table

Key words for different properties can be stipulated in the properties for the report elements. They are selected using the **Select language table keyword** dialog.
The entries to be displayed can be filtered using:

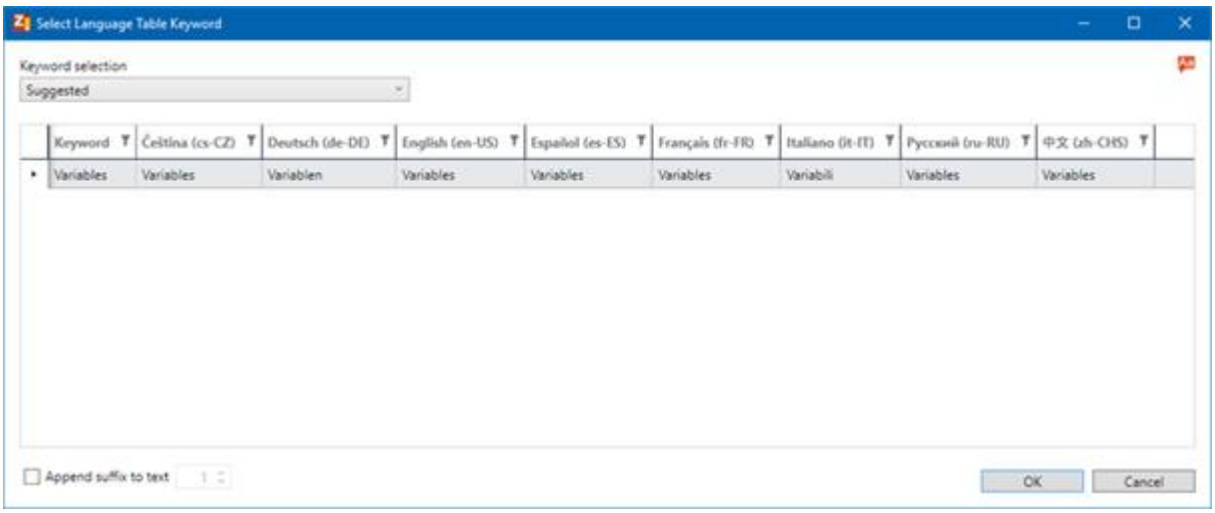
- **Selection of key words** drop-down list
- Filter in the table (on page 353)

### SELECT KEYWORD

To select a keyword:

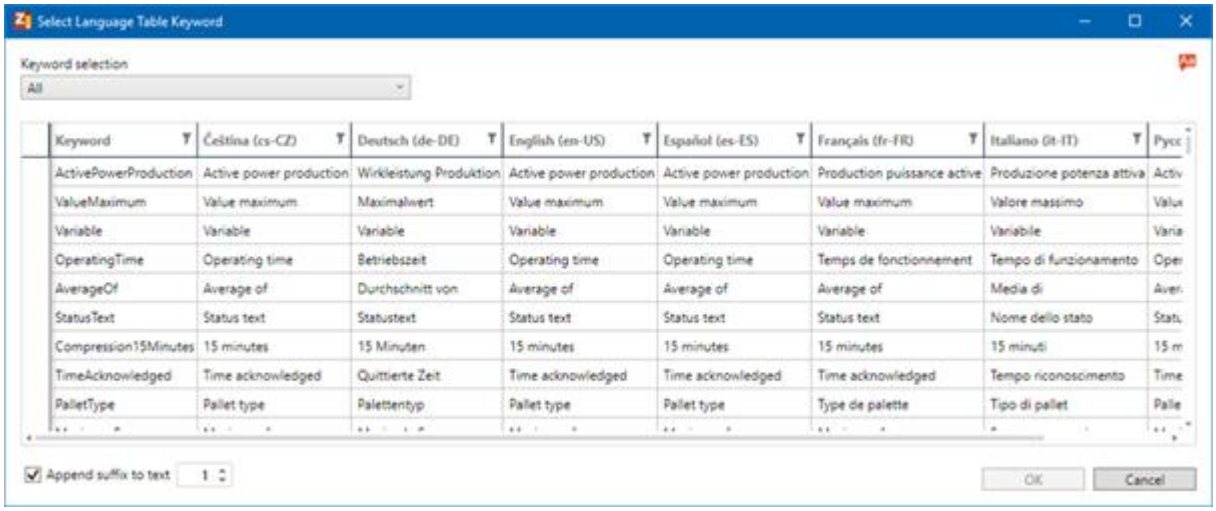
1. Open the dialog by means of the corresponding button of the property.
   Select the desired view using the **selection of key words** drop-down list:
   - *Suggested*
   - *Changed*
   - *User-defined*
   - *User-defined or changed*

- *All*




2. Select the desired key word.
   Only one keyword can be selected.
3. Select a suffix if required. It is thus possible to better distinguish the same keywords in the properties.
   The suffix can be a number between 1 and 50 and is added to the keyword.
4. Close the dialog by clicking on **OK**.

## SELECT LANGUAGE TABLE KEYWORD DIALOG




| Option | Description |
|---|---|
| **Keyword selection** | Selection of the key words to be displayed. Select from drop-down list:<br>▸ *Recommended*:<br>Key words recommended by the system. |

| Option | Description |
|---|---|
| | ▸ *Changed*:<br>Only shows the system texts amended by the user.<br>▸ *User-defined*:<br>Only shows the key words created by the user.<br>▸ *User-defined and changed*:<br>Only shows key words created by the user and/or amended system texts.<br>▸ *All*:<br>Shows all keywords. |
| **Edit language table** symbol | Clicking on the symbol opens the language table (on page 358) for editing. |
| **Table of key words** | Offers appropriate key words for selection corresponding to the configuration in the **Selection of keywords** property. The key words and the translations are shown.<br>The table can be sorted and filtered. |
| **Append suffix to text** | Allows the entry of a suffix to distinguish text that is the same in the properties.<br>▸ *Active*: A suffix is added to the text of the keyword. Input in the field directly or selection by means of the arrow keys.<br>Possible selection: Numbers from *1* to *50*.<br>**Note:** If a keyword must be unique and no suffix has been selected, a suffix is automatically created and added in the event of identical keywords. |

### CLOSE DIALOG

| Option | Description |
|---|---|
| **OK** | Applies settings and closes the dialog. |
| **Cancel** | Discards all changes and closes the dialog. |

# 16 Archive emulation

In ZAMS, you can emulate archives that are derived from figures from entries in the AML, CEL and archives in zenon. An emulated archive consists of metadata for archives and variables. These are calculated periodically according to the configuration.

Sources for basic archive and reset events:

- Emulated zenon archives
- Other emulated archives
- Emulated archives from the **3rd party database Connector** (on page 145)

For emulated archives that do not come from zenon, the data source must be called **Archive**. Variables from these archives are not available for the data sources **AML** or **CEL**.

Data from the emulated archives can be read directly from the Analyzer database regardless of the selected connector. For reports, the origin of the data - zenon archive or emulated archive - is transparent. Emulated archives are configured in ZAMS.

### Information

Inputs in text fields are evaluated during configuration. Dialogs can be confirmed with **OK** if there are no validation errors.

In general, the following applies:

- The following are not permitted for display name, names, references identifications and meanings: Comma (,) and simple apostrophe (').
- The following is not permitted for descriptions, units and status text: Comma (,)

Errors are explained in pop-up messages.

## CONFIGURE ARCHIVE EMULATION

To configure the archive emulation:

1. Select the **Emulated archives** entry in the **SQL Server** ribbon.

   The current configuration of the emulated archive is loaded.

   The dialog to administer the emulated archive is displayed.
2. Clicking on the **OK** button accepts all changes made.

### Information

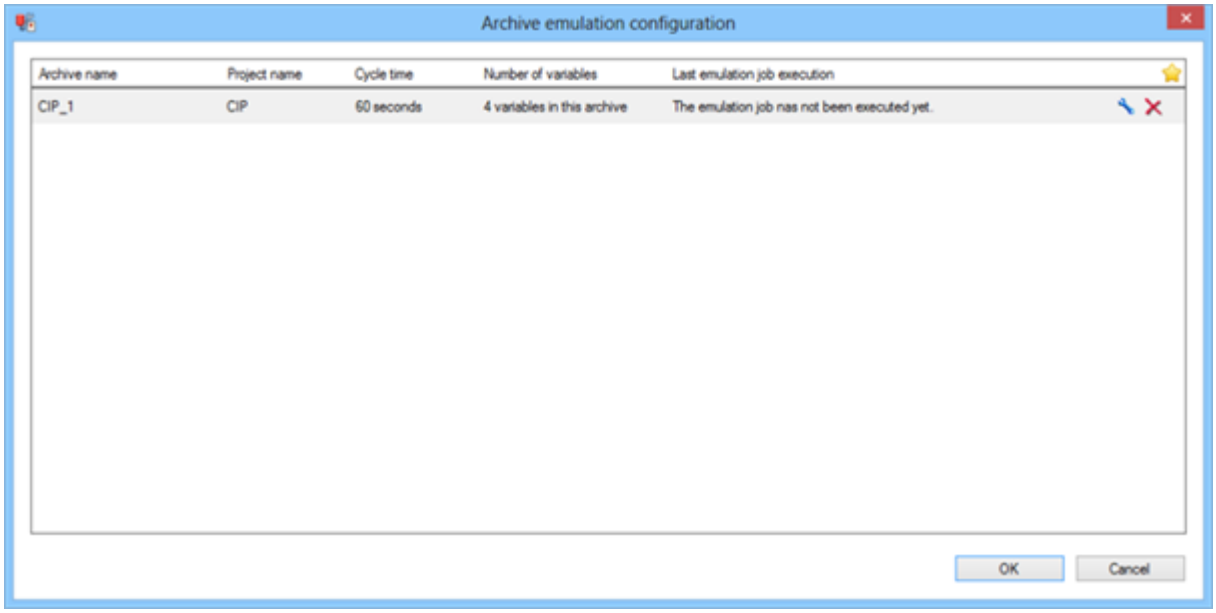
For the configuration of an emulated archive, the metadata must contain at least:

- A project
- A variable

For the configuration of an emulated archive variable, the data source *Archive* is only available if there is at least one archive present in the metadata.

## CONFIGURATION DIALOG

The configuration dialog shows all existing emulated archives when it is started.




| Option | Description |
|---|---|
| **List of archives** | Displays all configured archives. The list contains:<br>- **Archive name**: Name of the archive<br>- **Project name**: Name of the project that is assigned to the archive<br>- **Cycle time**: configured cycle time of the archive<br>- **Number of variables**: Number of variables in the archive<br>- **Execution of emulation tasks**: Information on the last execution of the SQL Server agent jobs that are assigned to the archive<br>- Buttons to create, edit and delete emulated archives |
| **New** | Opens the dialog for creating a new archive (on page 373). |

| Option | Description |
|---|---|
| **Edit** | Opens the dialog for editing the selected archive (on page 399). |
| **X** | Deletes the archive after a request for confirmation.<br>**Attention:** All data is deleted from the archive with the archive configuration.<br>**Note:** The archive can only be deleted if it is not used by another virtual archive (**calculated archive, emulated archive, 3rd party database connector archive**). |
| **OK** | Applies settings and closes the dialog.<br>ZAMS writes the changes to the database and to the SQL Server agent. If errors occur when writing the configuration, these are displayed in the output window of ZAMS. |
| **Cancel** | Discards all changes and closes the dialog. |

## USE OF TIME STAMPS

Archive emulation only uses a time stamp if a variable has changed a value. It must be ensured that all value changes are available.

The following applies for the AML: There is also a time stamp available for *Alarm cleared*. This is not used, but replaced by the time stamp for *Alarm received* of the next alarm.

Background: A constant flow of data from the base variables is used for emulation. There must be no point in time when the variable does not have a value. With alarms, the time for *Alarm cleared* is less than the time for *Alarm received* of the next alarm. If an entry for a value change of the base variables is missing, the old value is still set for emulation, because this value change does not appear in the basis data for emulation. As a result of this, it is possible that a calculation error (negative values) may occur.

## DELETING EMULATED ARCHIVES

The following is applicable for the deletion of emulated archives:

- Emulated archives and variables in emulated archives can only be deleted if no other emulated archives depend on them. In this check, all variables in the archive are take into account - including base variables for the value calculation and resetting.
- If an existing emulated variable (in the database) is used as a basic variable or resetting variable for a new emulated variable, it can no longer be deleted. This also applies after the deletion of the new emulated variable - if there is no longer dependency - as long as the

configuration of the emulated archive has not been ended.
This also applies for the existing emulated archive from which the emulated variable came.

- If an existing emulated variable or an existing emulated archive is deleted, these variables or this archive is no longer available when selecting the data source for new emulated variables, even if the change was not yet written to the database.
- **3rd party** database **Connector** archives and variables in these archives can only be deleted if no emulated archives depend on them.

## 16.1 Editing modes

The **New** and **Edit** buttons open the respective configuration dialog,depending on the status of the archive:

- **Create new archive**: A completely new archive is created. All settings for archive variables can be modified.
- **Edit newly-created archive**: A newly-created archive that has not yet been written to the database is edited. Or an archive that has already been saved and has been made editable again.
  - Archive: All settings can be edited, with the exception of **Assigned project** and **Reference**.
  - Variables: All settings can be edited.
- **Edit existing Archive**: An archive that was created and saved in a previous configuration is edited. This was already written to the database and thus has entries in the metadata tables.
  - Standard:

    Archive: Only the **Data calculation** can be changed.

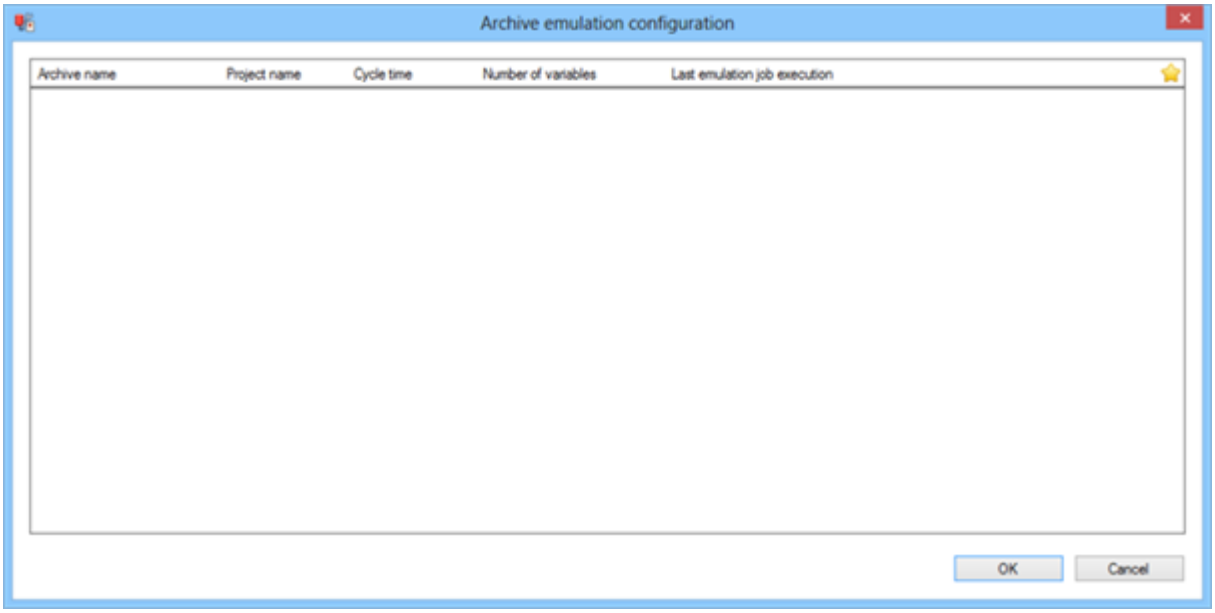
    Variables: Only displayed as read-only.
  - Make editable (on page 399): The editing of an archive can be enabled, with the exception of **assigned project** and **Reference**. Existing data is deleted in the process.

## 16.2 Creating an emulated archive

To create a new emulated archive:

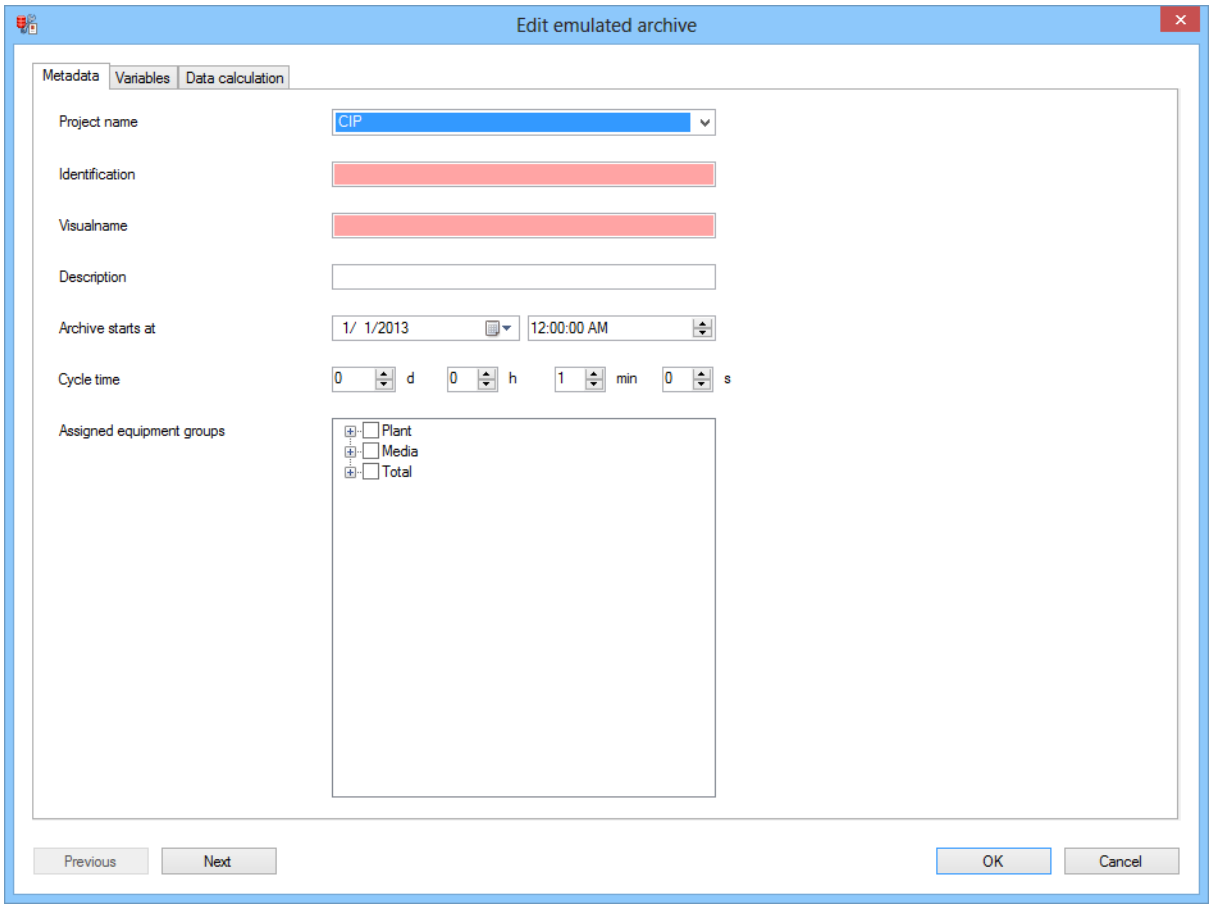
1. Select the **Emulated archives** entry in the **SQL Server** ribbon.

The dialog for configuring emulated archives is opened.




2. Click on the **New** symbol to create a new archive.

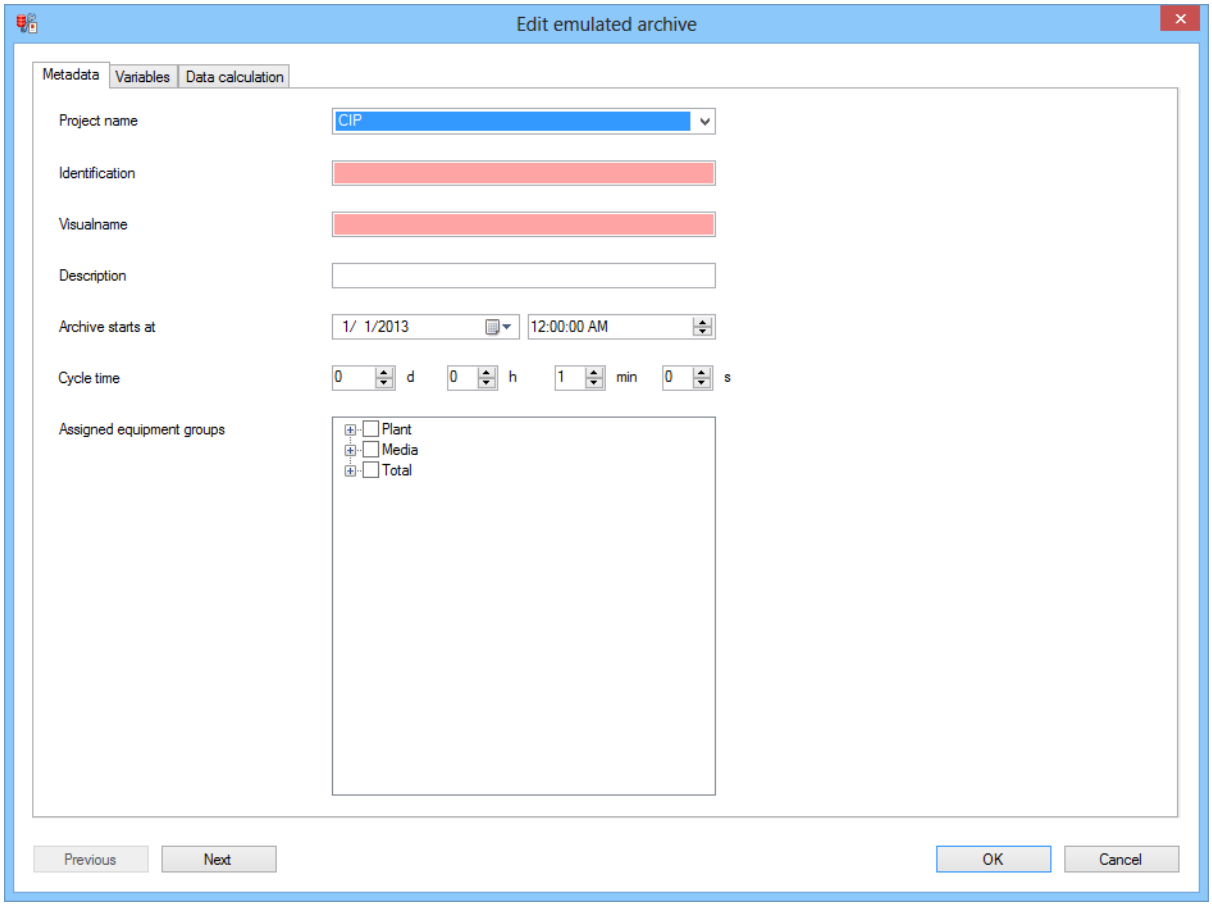
   The dialog for configuring an emulated archive is opened.



| Option | Description |
|---|---|
| **Metadata** | Configuration of the metadata (on page 376). |
| **Variables** | Configuration of the variables (on page 378). |
| **Data calculation** | Configuration of the data calculation (on page 396). |
| **Previous** | **Switches to previous tab. (Deactivated in the first tab)** |
| **Next** | Switches to the next tab. (Deactivated in the last tab) |
| **OK** | Applies all changes in all tabs and closes the dialog.<br>Only available if all necessary configuration has been carried out. |
| **Cancel** | Discards all changes in all tabs and closes the dialog.If data has already been entered, a request for confirmation is made before the changes are discarded. |

## 16.2.1 Metadata

The metadata is configured in this tab.




| Option | Description |
|---|---|
| **Project name** | Selection from the drop-down list with all existing project names.<br>The first project entered is selected by default for new projects.<br>**Attention:** If this selection is changed and there are already variables in the variable list, it is emptied! |
| **Identification** | Input of the identification for the archive.<br>▸ Maximum length: *128 characters*<br>▸ Must not be empty.<br>▸ Must not be used by another archive that is assigned to the same project. Capitalization is not taken into account. |
| **Visual name** | Entry of the visual name of the archive.<br>▸ Maximum length: *128 characters* |

| Option | Description |
|---|---|
| | ▸ Must not be empty.<br>▸ Must not be used by another archive that is assigned to the same project. Capitalization is not taken into account. |
| **Detailed information** | Entry of the description of the archive.<br>▸ Maximum length: *256 characters* |
| **Archive starts at** | Stipulation of data and time for the start of the archive.<br>▸ Date: Entry of the date or selection from a calendar.<br>▸ Time: Entry of the time or setting by means of arrow keys.<br>Entry in UTC.<br>Earliest time point: *1.1.2013 00:00:00* |
| **Cycle time** | Stipulation of the cycle time for the archive. Entry of the interval or setting by means of arrow keys.<br>Value must be greater than *0*<br>Default: *1 minute* |
| **Assigned equipment groups** | Assignment of equipment group to the archive. Selection by activating the checkbox in front of the respective equipment group.<br>Clicking on the + sign expands the group.<br>Default: No Allocation. |
| **Previous** | **Switches to previous tab. (Deactivated in the first tab)** |
| **Next** | Switches to the next tab. (Deactivated in the last tab) |
| **OK** | Applies all changes in all tabs and closes the dialog.<br>Only available if all necessary configuration has been carried out. |
| **Cancel** | Discards all changes in all tabs and closes the dialog.If data has already been entered, a request for confirmation is made before the changes are discarded. |

**Note:** Mandatory fields and fields that are empty that have a negative validation are displayed with a red background.

## DIFFERENCES WHEN EDITING NEW ARCHIVES

If already-created, but not-yet saved archives are edited, the dialog exhibits the following differences:

- All fields: The values that have already been set are displayed instead of the default values.
- **Project name**: The drop-down list to select a project is deactivated.
- **Identification**: The entry for the reference is deactivated.
- **Assigned equipment groups**: If the equipment model or one of its elements has a active assignment, then the complete branch of the group is displayed.

### DIFFERENCES WHEN EDITING SAVED ARCHIVES

If already-saved archives are edited, the dialog exhibits the following differences as standard:

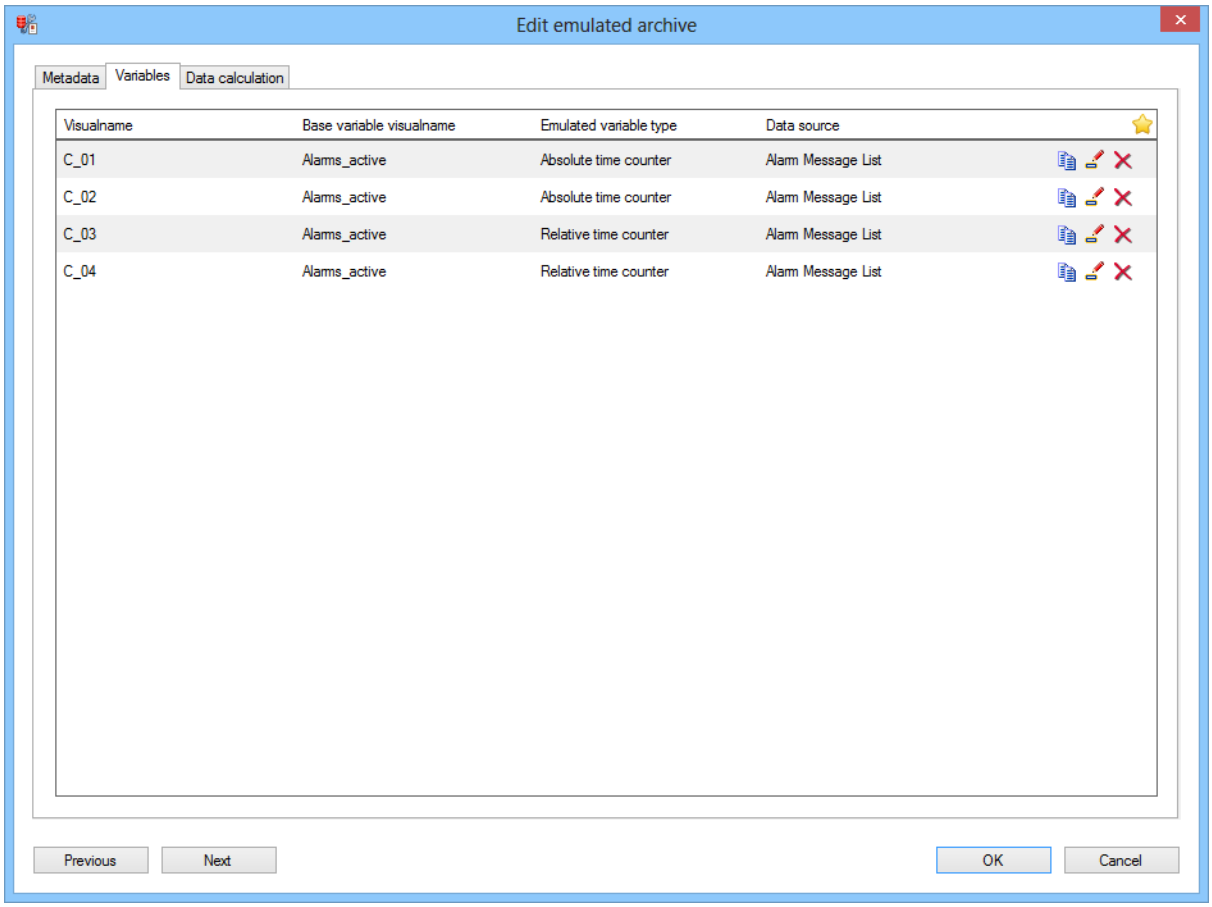
- All fields: The values that have already been set are displayed instead of the default values.
- All input possibilities are deactivated.

The editing of archives that have already been saved can be activated (on page 399) again.

## 16.2.2 Variables

Emulated variables are created and edited in this tab.

When validating the dialog to create a new emulated archive, at least one emulated variable must be present. Emulated variables that have the same base variable must also have the same data origin. This also includes variables that supply additional reset event (on page 392) for absolute counters. Variables can also be duplicated.

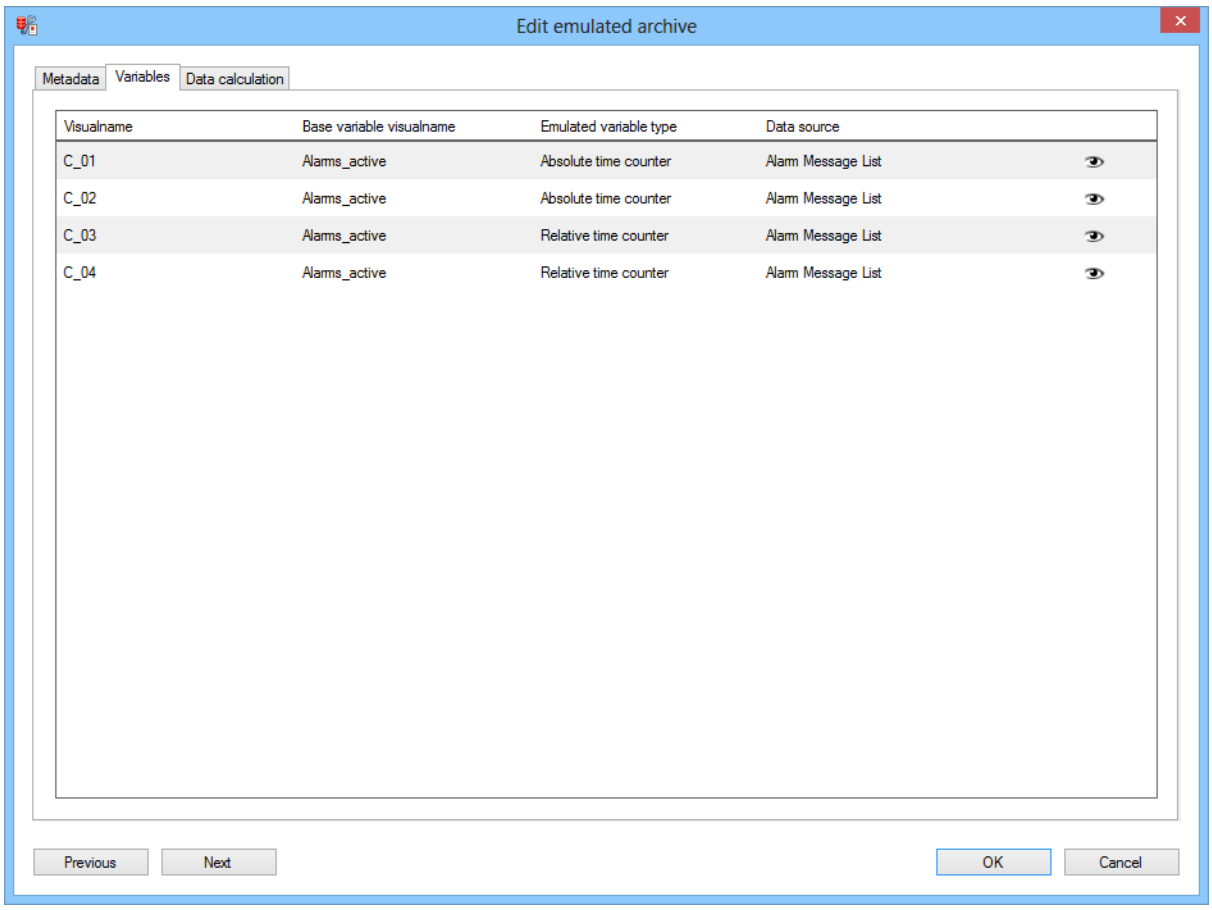



| Option | Description |
|---|---|
| **Variable list** | Displays all configured variables. The list contains:<br>▸ **Visual name**: Name with which the variable is displayed<br>▸ **Base variable visualname**: Name of the variables for the value calculation<br>▸ **Emulated variable type**:<br>▸ **Data source**: Origin of base variables<br>This list is empty by default when a new archive is created. |
| Symbol: **New** | Opens the dialog for Creating new variables (on page 381). |
| Symbol: **Duplicate** | Creates, on the basis of the selected variables, a new variable and opens the dialog to configure the variables. This dialog is filled with the values of the base variables. The name and visual name of the |

| Option | Description |
|---|---|
| | variables must be unique. These are always made clear with numbers in brackets in the duplicated variables. |
| Symbol: **Edit** | Opens the dialog for editing the selected variable (on page 381). |
| Symbol: **Delete** | Deletes the selected variable. |
| **Previous** | **Switches to previous tab. (Deactivated in the first tab)** |
| **Next** | Switches to the next tab. (Deactivated in the last tab) |
| **OK** | Applies all changes in all tabs and closes the dialog.<br>Only available if all necessary configuration has been carried out. |
| **Cancel** | Discards all changes in all tabs and closes the dialog.If data has already been entered, a request for confirmation is made before the changes are discarded. |

## DIFFERENCES WHEN EDITING SAVED ARCHIVES

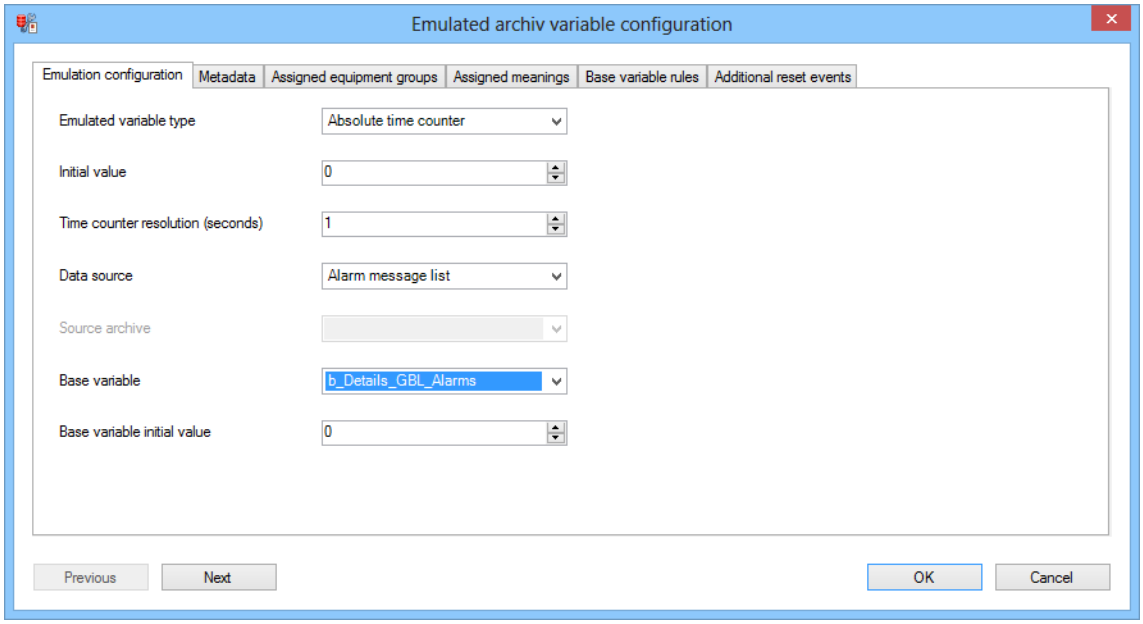
If already-saved archives are edited, the dialog exhibits the following differences:



- No new variables can be created.
- No variables can be deleted.
- No variables can be edited.
- The **Display** symbol allows the configuration of variables to be displayed.

### 16.2.2.1 Emulation configuration

The emulated variables are created in this tab.




| Option | Description |
|---|---|
| **Emulated variable type** | Selection of the type of emulated variable from a drop-down list. Depending on the type selected, either all or only selected tabs are displayed and options may be deactivated.<br><br>Emulation types:<br>• *Absolute time counter*<br>All tabs are displayed.<br>Default on initial configuration.<br>• *Relative time counter*<br>Settings from **Additional reset events** (on page 392) are not relevant and are not shown.<br>• *Absolute event counter*<br>All tabs are displayed.<br>• *Relative event counter*<br>Settings from **Additional reset events** (on page 392) are not |

| Option | Description |
|---|---|
| | relevant and are not shown.<br>▸ *Sum*<br>Settings from Base variable rules (on page 390) and **Addittional reset events** (on page 392) are not relevant and are not shown.<br>▸ *Time-corrected average*<br>Settings from Base variable rules (on page 390) and **Additional reset events** (on page 392) are not relevant and are not shown.<br>▸ *Minimum*<br>Settings from Base variable rules (on page 390) and **Additional reset events** (on page 392) are not relevant and are not shown.<br>▸ *Maximum*<br>Settings from Base variable rules (on page 390) and **Additional reset events** (on page 392) are not relevant and are not shown.<br>▸ *Difference counter*<br>Settings from Base variable rules (on page 390) and **Additional reset events** (on page 392) are not relevant and are not shown.<br>For further information on the emulation types, see the **Details of emulation types** section. |
| **Initial value** | Entry of the initial value of the variable at the time the archive is started.<br>Only available if the **type of the emulated variables** is an absolute counter (*absolute time counter*, *absolute event counter*).<br>▸ Minimum: *0*<br>▸ Maximum: *1000000* |
| **Time counter resolution (seconds)** | Resolution of the time counter in seconds.<br>Only available if the **type of the emulated variables** is a time counter (*absolute time counter*, *relative time counter*).<br>▸ Minimum: *1*<br>▸ Maximum: *86400* (1 day)<br>Examples: |

| Option | Description |
|---|---|
| | ▸ *60*: Minute counter<br>▸ *3600*: Hour counter<br>▸ *86400*: Day counter |
| **Data source** | Selection of a data source for the base variable from drop-down list:<br>▸ *Alarm Message List*<br>▸ *Chronological Event List*<br>▸ *Archive* |
| **Source archive** | Selection of a source archive from a drop-down list. The list contains all archives of the project that was selected in the metadata (on page 376) dialog. This also includes emulated archives that were already saved in the metadata.<br>Only available if *archive* was selected as a **data source**. |
| **Base variable** | Selection of a base variable from a drop-down list, the value of which is derived from the values of the emulated variables.<br>Depending on the data source, available for:<br>▸ **Data source** *alarm message list* or *chronological event list*: All available variables of the project that was selected in the metadata (on page 376) dialog. This also includes emulated variables that were already saved in the metadata.<br>▸ **Data source** *Archive*: All variables that are assigned in the metadata to the archive with an aggregation of **Raw value** (*0*). This also includes emulated archives that were already saved in the metadata. |
| **Base variable initial value** | Entry of the initial value of the base variables at the time the archive is started.<br>▸ Minimum: *0*<br>▸ Maximum: *1000000* |
| **Previous** | **Switches to previous tab. (Deactivated in the first tab)** |
| **Next** | Switches to the next tab. (Deactivated in the last tab) |
| **OK** | Applies all changes in all tabs and closes the dialog.<br>Only available if all necessary configuration has been carried out. |
| **Cancel** | Discards all changes in all tabs and closes the dialog.If data has |

| Option | Description |
|---|---|
| | already been entered, a request for confirmation is made before the changes are discarded. |

## DETAILS OF EMULATION TYPES

In the **Emulation configuration** tab, there are eight emulation types available for selection in the **Emulated variable type** drop-down list.

**The following applies to all emulation types:** If there is no value at the start of the archive capsule (value change was carried out exactly with the start time of the archive capsule), then as a maximum at the start time of the emulated archive, an attempt is made to find a valid value before the start of the archive capsule for the base variable. If a corresponding value is found, this is used at the start time of the archive capsule. Otherwise the configured initial value is used.

Possible values for emulation types:

- *Absolute time counter*

  In each archive capsule of the emulated archive, the set time filter setting is used to count how long the base variable was in one of the states set out in the Base variable rules (on page 390). The counter can be set to *0* by means of the defined resetting rules (Base variable rules (on page 390) and Additional reset events (on page 392) tabs). At the end of the archive capsule, the value of the counter is written to the emulated variable in the emulated archive.

  Start value of the current archive capsule: End value of the last archive capsule.

  All tabs are displayed.

- *Relative time counter*

  In each archive capsule of the emulated archive, the set time filter setting is used to count how long the base variable was in one of the states set out in the Base variable rules (on page 390). A relative counter cannot be reset to *0*. At the end of the archive capsule, the value of the counter is written to the emulated variable in the emulated archive.

  Start value of the current archive capsule: always *0*.

  Settings from **Additional reset events** (on page 392) are not relevant and are not shown.

- *Absolute event counter*

  In each archive capsule of the emulated archive, how often the base variable has changed to one of the states set out by the Base variable rules (on page 390) is counted. The counter can be set to *0* by means of the defined resetting rules (Base variable rules (on page 390) and Additional reset events (on page 392) tabs). At the end of the archive capsule, the value of the counter is written to the emulated variable in the emulated archive.

  Start value of the current archive capsule: End value of the last archive capsule.

All tabs are displayed.

- *Relative event counter*

  In each archive capsule of the emulated archive, how often the base variable has changed to one of the states set out by the Base variable rules (on page 390) is counted. A relative counter cannot be reset to *0*. At the end of the archive capsule, the value of the counter is written to the emulated variable in the emulated archive.

  Start value of the current archive capsule: always *0*.

  Settings from **Additional reset events** (on page 392) are not relevant and are not shown.

- *Sum*

  All values of the base variables are added up in each archive capsule. The sum is written to the emulated variable in the emulated archive at the end of the archive capsule.

  Settings from Base variable rules (on page 390) and **Additional reset events** (on page 392) are not relevant and are not shown.

- *Time corrected average*

  In each archive capsule, the time-corrected average value of all values of the base variables is calculated in the archive capsule. The time-corrected average value is written to the emulated variable in the emulated archive at the end of the archive capsule.

  Settings from Base variable rules (on page 390) and **Additional reset events** (on page 392) are not relevant and are not shown.

- *Minimum*

  In each archive capsule, the minimum of all values of the base variables is calculated in the archive capsule. The minimum is written to the emulated variable in the emulated archive at the end of the archive capsule.

  Settings from Base variable rules (on page 390) and **Additional reset events** (on page 392) are not relevant and are not shown.

- *Maximum*

  In each archive capsule, the maximum of all values of the base variables is calculated in the archive capsule. The maximum is written to the emulated variable in the emulated archive at the end of the archive capsule.

  Settings from Base variable rules (on page 390) and **Additional reset events** (on page 392) are not relevant and are not shown.

- *Difference counter*

  Converts an *absolute time counter* in zenon or recorded in the archive emulation into a *relative time counter*.

  Settings from base variable rules (on page 390) and **additional reset events** (on page 392) are not relevant and are not displayed.

You can find details on the calculation for developers in the **Difference counter procedure** chapter and in the **zenon Analyzer for developers** manual.

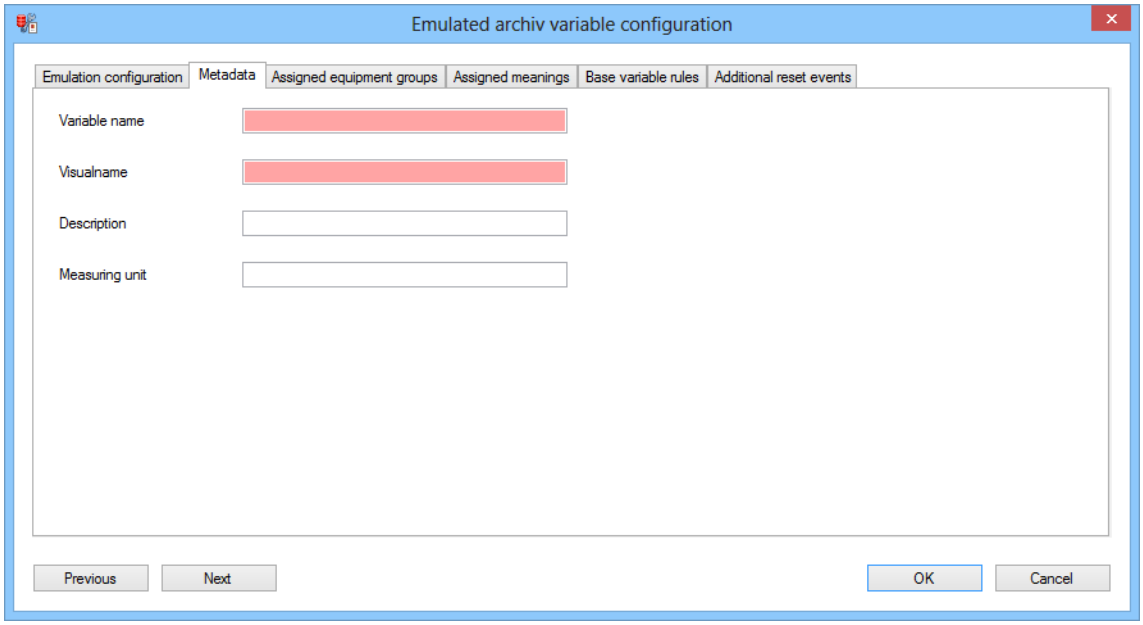
### Information

Milliseconds are not used for cyclical archives in zenon. They are calculated but not reset to *>0*. Exception: Alternate values.

This must be taken into account when the data is obtained. Because the minimum read time of a cyclical archive is 1 second, a maximum of 1 value per second can come.

## 16.2.2.2 Metadata

The metadata is configured in this tab.



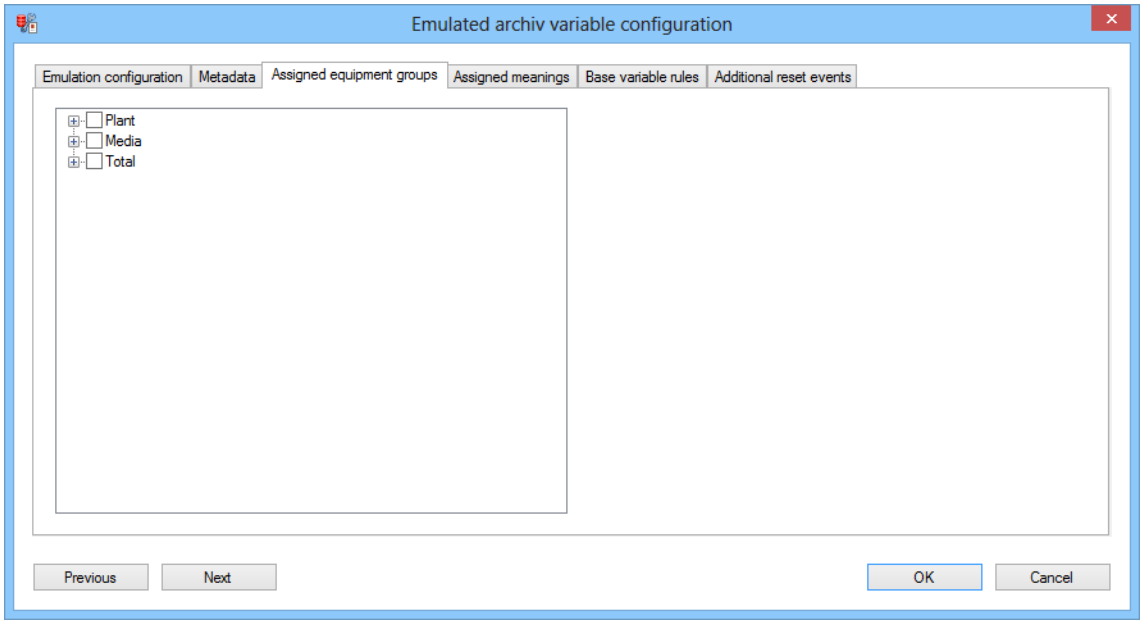

| Option | Description |
|---|---|
| **Variable name** | Entry of the variable name.<br>▸ Maximum length: *128 characters*.<br>▸ Must not be empty.<br>▸ Must not contain a comma<br>▸ Must not be used by another variable that is assigned to the same project. Capitalization is not taken into account. |
| **Visual name** | Entry of the visual name of the variables. |

| Option | Description |
|---|---|
| | ▸ Maximum length: *128 characters*<br>▸ Must not be empty.<br>▸ Must not contain a comma<br>▸ Must not be used by another variable that is assigned to the same project. Capitalization is not taken into account. |
| **Description** | Description of the variables.<br>Maximum length: *256 characters* |
| **Measuring unit** | Unit of measurement the variables.<br>Maximum length: *50 characters* |
| **Previous** | **Switches to previous tab. (Deactivated in the first tab)** |
| **Next** | Switches to the next tab. (Deactivated in the last tab) |
| **OK** | Applies all changes in all tabs and closes the dialog.<br>Only available if all necessary configuration has been carried out. |
| **Cancel** | Discards all changes in all tabs and closes the dialog.If data has already been entered, a request for confirmation is made before the changes are discarded. |

**Note:** Mandatory fields and fields that are empty that have a negative validation are displayed with a red background.

### 16.2.2.3 Assigned equipment groups

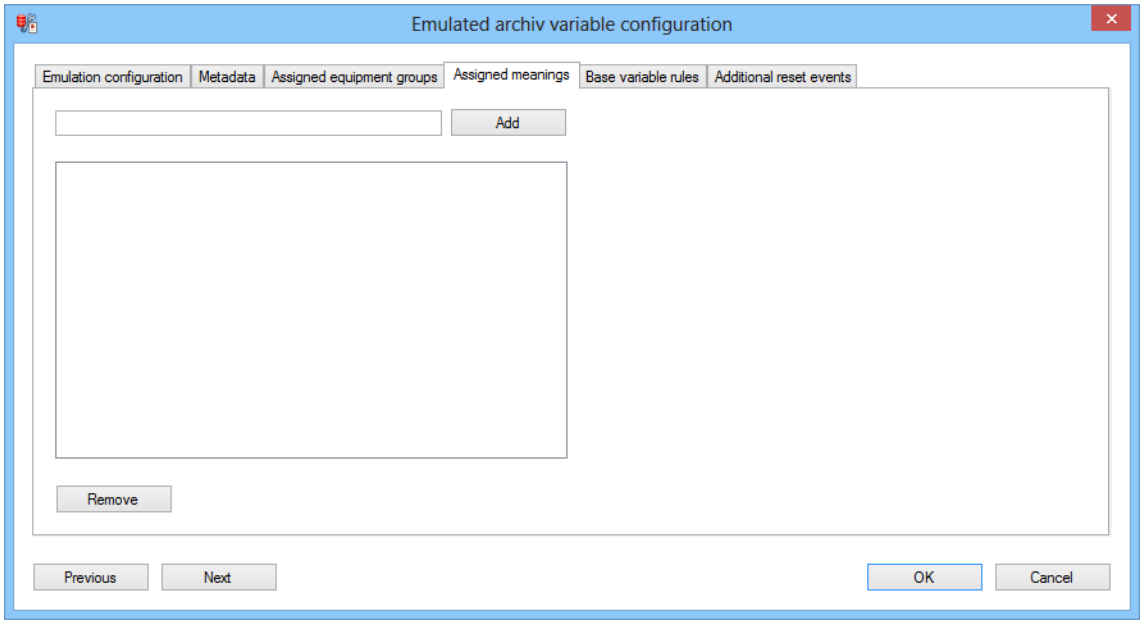
The equipment groups are configured in this tab.




| Option | Description |
|---|---|
| **Tree with equipment groups** | Selection of the desired equipment group from the tree structure. They are selected by activating the checkboxes in front of the desired groups.<br>▸ Display on new creation: closed tree<br>▸ Display when editing: all activated groups are displayed and their trees are expanded |
| **Previous** | **Switches to previous tab. (Deactivated in the first tab)** |
| **Next** | Switches to the next tab. (Deactivated in the last tab) |
| **OK** | Applies all changes in all tabs and closes the dialog.<br>Only available if all necessary configuration has been carried out. |
| **Cancel** | Discards all changes in all tabs and closes the dialog.If data has already been entered, a request for confirmation is made before the changes are discarded. |

## 16.2.2.4 Assigned meanings

The meanings are configured in this tab.



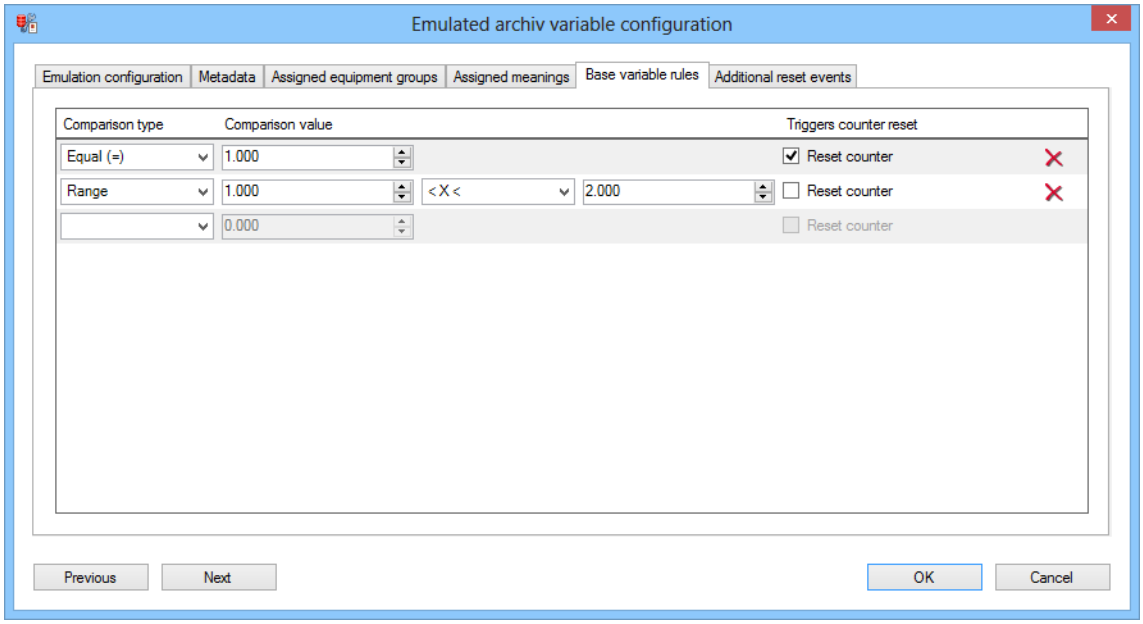

| Option | Description |
|---|---|
| **Input field** | Entry of a meaning<br>Maximum length: *50 characters* |
| **Add** | Clicking on the button adds a meaning from the **input field** to the **list of meanings**. |
| **List of meanings** | Contains all assigned meanings.<br>Multiple selection is possible with the **Ctrl key + left mouse click** or the **Shift key + left mouse click**. |
| **Remove** | Removes all highlighted entries from the **list of meanings**. |
| **Previous** | **Switches to previous tab. (Deactivated in the first tab)** |
| **Next** | Switches to the next tab. (Deactivated in the last tab) |
| **OK** | Applies all changes in all tabs and closes the dialog.<br>Only available if all necessary configuration has been carried out. |
| **Cancel** | Discards all changes in all tabs and closes the dialog.If data has already been entered, a request for confirmation is made before the changes are discarded. |

## 16.2.2.5 Base variable rules

The rules for the basic variables are configured in this tab.

Only available for the following types of emulated variables:

- *Absolute time counter*
- *Relative time counter*
- *Absolute event counter*
- *Relative event counter*




| Option | Description |
|---|---|
| **List of rules** | Display of the configured rules.<br><br>The list is empty for newly-created variables. The following are displayed for pre-existing variables:<br>- **Comparison type**<br>- **Comparison value**<br>- **Triggers counter reset**<br><br>In addition to configured rules, an empty rule is always offered if the dialog was opened in an editable mode and the rules (reset) allow it.<br><br>In an empty rule, all control elements, with the exception of the comparison type, are deactivated. |
| **Comparison type** | Selection of the comparison type from the drop-down list. The |

| Option | Description |
|---|---|
| | following are available:<br>▸ *Equal (=)*<br>▸ *Less (<)*<br>▸ *Less or equal (<=)*<br>▸ *Greater (>)*<br>▸ *Greater or equal (>=)*<br>▸ *Not equal (!=)*<br>▸ *Range:* Compares two values to one another and shows further input fields for **Comparison type** and **Comparison value**. |
| **Comparison value** | Entry of the comparison value. |
| **Reset counter** | ▸ Active: The counter is reset if the rule is met.<br>Only available if the **type of the emulated variables** is an absolute counter (*absolute time counter*, *absolute event counter*). |
| Symbol: **Delete** | Clicking on the button deletes the rule. |
| **Previous** | **Switches to previous tab. (Deactivated in the first tab)** |
| **Next** | Switches to the next tab. (Deactivated in the last tab) |
| **OK** | Applies all changes in all tabs and closes the dialog.<br>Only available if all necessary configuration has been carried out. |
| **Cancel** | Discards all changes in all tabs and closes the dialog.If data has already been entered, a request for confirmation is made before the changes are discarded. |

## AREAS

The 'areas' comparison type defines a range between two values. The following rules are available:

- *[number] < X < [number]*
- *[number] < X <= [number]*
- *[number] <= X < [number]*
- *[number] <= X <= [number]*

## NOTE ON VALIDATION:

When validating the entries before creating the variables, the legal regulations must not be exceeded.

Examples of overlapping:

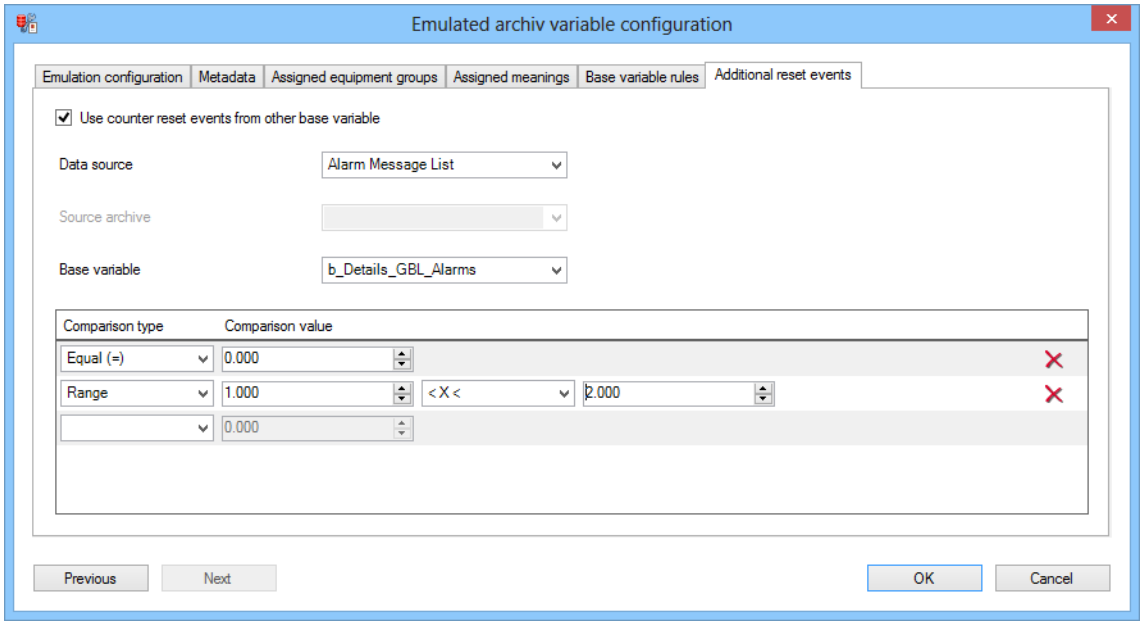
- 2 or more rules are set to *Equal (=)* and have the same value.
- 1 or more rules are set to *Equal (=)* and have a value that is *Greater than (>)/Less or equal to (<=)* the comparison value of an existing *Greater than (>)/Less than or equal to(<=)* rule.
- 2 rules both use a greater comparison (regardless of whether *Greater than (>)* or *Greater than or equal to (>=)*).
- 2 rules both use a smaller comparison (regardless of whether *Less than (<)* or *Less than or equal to (<=)*).
- The value ranges of a *Greater than or equal to (>=)* and a *Less than or equal to (<=)* rule overlap. At least one figure is present in both ranges.

## 16.2.2.6 Additional reset events

In this tab, events for absolute counters are configured, which lead to defined results, in addition to the events defined in the **Base variable rules** (on page 390), to reset the base variables.

Only available for the following types of emulated variables:

- *Absolute time counter*
- *Absolute event counter*



| Option | Description |
|---|---|
| **Use additional reset events for the counter of base variables** | ▸ *Active*: Events to reset the absolute counter are, in addition to configuration in the Base variable rules (on page 390) tab, set by another base variable. This resets the **base variable** (on page 381) selected in the Emulation configuration (on page 381) tab for the counter. |
| **Data Source** | Selection of a data source list for the variables from which the reset event comes, from a drop-down list:<br>▸ *Alarm Message List*<br>▸ *Chronological Event List*<br>▸ *Archive* |
| **Source archive** | Selection of source archive for the variables from which the reset events come, from a drop-down list: The list contains all archives of the project that was selected in the metadata (on page 376) dialog. This also includes emulated archives that were already saved in the metadata.<br>Only available if *archive* was selected as a **data source**. |
| **Base variable** | Selection of base variables from which the additional reset events come, from a drop-down list.<br>Depending on the data source, available for:<br>▸ **Data source** *alarm message list* or *chronological event list*: All available variables of the project that was selected in the metadata (on page 376) dialog. This also includes emulated variables that were already saved in the metadata.<br>▸ **Data source** *Archive*: All variables that are assigned in the metadata to the archive with an aggregation of **Raw value** (*0*). This also includes emulated archives that were already saved in the metadata. |
| **List of rules** | Display of the configured rules.<br>The list is empty for newly-created variables. The following are displayed for pre-existing variables:<br>▸ **Comparison type**<br>▸ **Comparison value**<br>In addition to configured rules, an empty rule is always offered if the dialog was opened in an editable mode and the rules (reset) allow it. |

| Option | Description |
|---|---|
| | In an empty rule, all control elements, with the exception of the comparison type, are deactivated. |
| **Comparison type** | Selection of the comparison type from the drop-down list. The following are available:<br>▸ *Equal (=)*<br>▸ *Less (<)*<br>▸ *Less or equal (<=)*<br>▸ *Greater (>)*<br>▸ *Greater or equal (>=)*<br>▸ *Not equal (!=)*<br>▸ *Range:* Compares two values to one another and shows further input fields for **Comparison type** and **Comparison value**. |
| **Comparison value** | Entry of the comparison value. |
| Symbol: **Delete** | Clicking on the button deletes the rule. |
| **Previous** | **Switches to previous tab. (Deactivated in the first tab)** |
| **Next** | Switches to the next tab. (Deactivated in the last tab) |
| **OK** | Applies all changes in all tabs and closes the dialog.<br>Only available if all necessary configuration has been carried out. |
| **Cancel** | Discards all changes in all tabs and closes the dialog.If data has already been entered, a request for confirmation is made before the changes are discarded. |

## Attention

The **list of rules** for valid reset events must contain at least one rule during validation if the option **Use additional reset events for the counter of base variables** has been activated.

## AREAS

The 'areas' comparison type defines a range between two values. The following rules are available:

- *[number] < X < [number]*
- *[number] < X <= [number]*
- *[number] <= X < [number]*
- *[number] <= X <= [number]*

## NOTE ON VALIDATION:

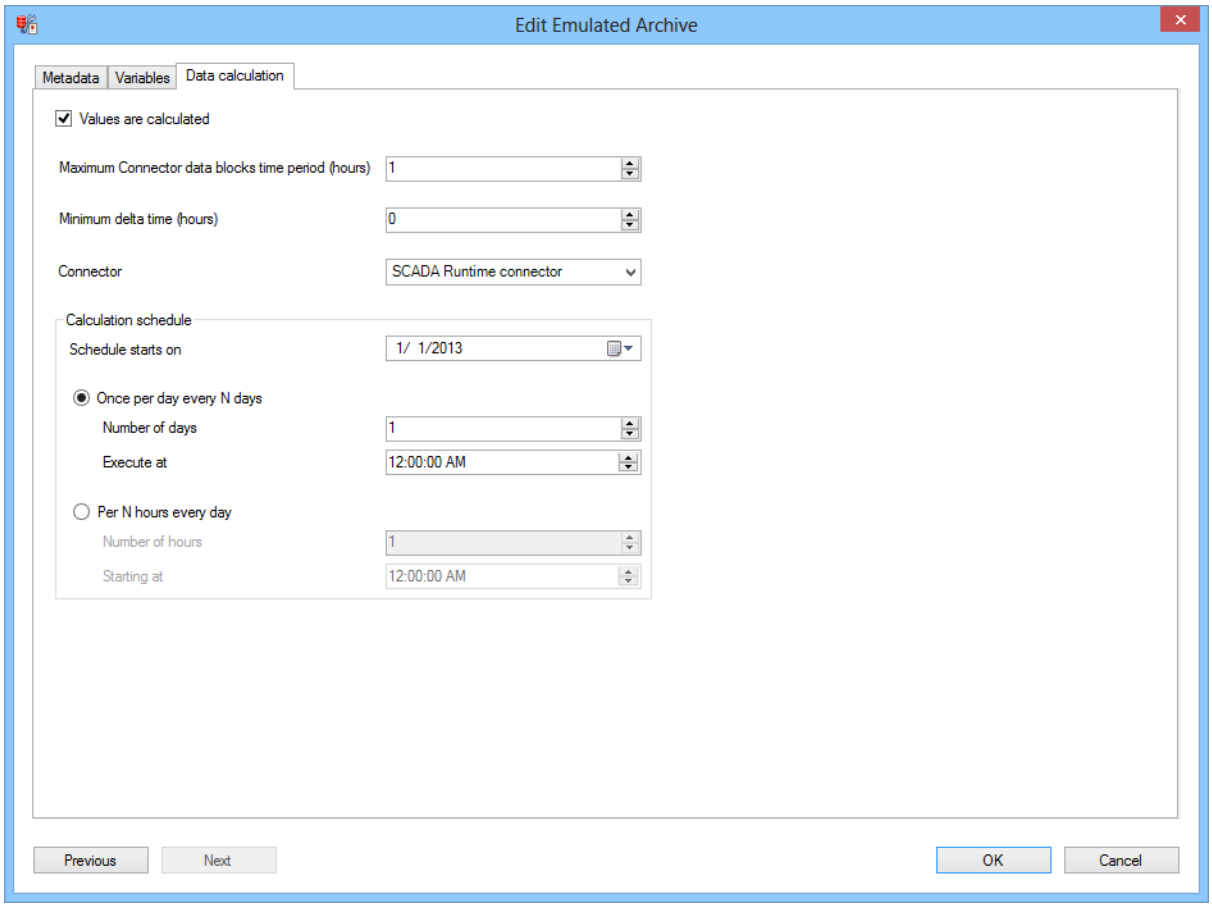
When validating the entries before creating the variables, the legal regulations must not be exceeded.

Examples of overlapping:

- 2 or more rules are set to *Equal (=)* and have the same value.
- 1 or more rules are set to *Equal (=)* and have a value that is *Greater than (>)/Less or equal to (<=)* the comparison value of an existing *Greater than (>)/Less than or equal to(<=)* rule.
- 2 rules both use a greater comparison (regardless of whether *Greater than (>)* or *Greater than or equal to (>=)*).
- 2 rules both use a smaller comparison (regardless of whether *Less than (<)* or *Less than or equal to (<=)*).
- The value ranges of a *Greater than or equal to (>=)* and a *Less than or equal to (<=)* rule overlap. At least one figure is present in both ranges.

## 16.2.3 Data calculation

The data calculation is configured in this tab. The options can be configured without limitations in all three editing modes (on page 373).




| Option | Description |
|---|---|
| **Values are calculated** | *Active*: Values for the emulated archive are calculated in the SQL server agent. |
| **Maximum connector-Data block time period (hours)** | Stipulates the maximum time period in hours for which connectors can be obtained in a query. Entry in the field or configuration using the arrow keys.<br>▸ Minimum: *1*<br>▸ Maximum *10000*<br>▸ Default: *1*<br>If a larger time range is needed in total, several connector calls are carried out after one another.<br>**Example:** |

| Option | Description |
|---|---|
| | ▸ Connector data from three days is to be obtained.<br>▸ The query is to be made in three parts.<br>▸ Entry in the field: 24<br><br>**Background information:** If very large amounts of data are obtained in a query, the working memory may be to small for the Runtime server. For archive data, for example, this leads to an "**Out-Of-Memory**" error. The corresponding message window then blocks the Runtime server until the message is confirmed on the server itself. This situation can be avoided with the appropriate configuration. |
| **Minimum delta time (hours)** | Stipulates how old, in hours, an archive capsule of the emulated archive must be before values for it are calculated. Entry in the field or configuration using the arrow keys.<br><br>Minimum: *0*<br><br>Maximum: *10000*<br><br>Default: *0*<br><br>**Example:**<br>▸ Entry: *10*<br>▸ Current time: *6/6/2013; 4:00:00 PM*<br>▸ Target: From 00:00:00 on June 6, 2013, one archive capsule per hour is to be written.<br>▸ Only values for the archive capsules from 00:00:00 to 05:00:00 on 2013/06/06 are calculated and written.<br>▸ Reason: The archive capsules from 06:00:00 to 16:00:00 on 2013/06/06 are not older than 10 hours.<br><br>**Background:** If data can only be forwarded up to a certain time, for example up to the last SQL export, this can be configured here. |
| **Connector** | Selection from drop-down list that is to be used to obtain the data for the base variables. |
| **Calculation schedule** | Configuration of the time plan for the calculation of values. |
| **Schedule starts on** | Stipulation of the time from which the schedule is to run. Entry in the field or configuration using the arrow keys. |

| Option | Description |
|---|---|
| **Once per day every N days** | *Active*: The calculation is carried out every N days at a certain time.<br>▸ N days: Configuration with the **Number of days** option<br>▸ Time: Configuration with **Execute at** option |
| **Number of days** | Stipulation of the interval between two calculations in days. Entry in the field or configuration using the arrow keys.<br>Minimum: *1*<br>Maximum: *100* |
| **Execute at** | Stipulation of the time at which the calculation is carried out on day N. Entry in the field or configuration using the arrow keys. |
| **Per N hours every day** | *Active*: The calculation is carried out daily every N hours at a certain interval.<br>▸ Distance: Configuration with the **Number of hours** option<br>▸ Start time: Configuration with **Start at** option |
| **Number of hours** | Stipulation of the interval between two calculations in hours. Entry in the field or configuration using the arrow keys.<br>▸ Minimum: *1*<br>▸ Maximum: *23* |
| **Starting at** | Stipulation of the time at which the first daily calculation is carried out. Entry in the field or configuration using the arrow keys. |
| **Previous** | **Switches to previous tab. (Deactivated in the first tab)** |
| **Next** | Switches to the next tab. (Deactivated in the last tab) |
| **OK** | Applies all changes in all tabs and closes the dialog.<br>Only available if all necessary configuration has been carried out. |
| **Cancel** | Discards all changes in all tabs and closes the dialog.If data has already been entered, a request for confirmation is made before the changes are discarded. |

## EXAMPLES

### ONCE A WEEK

The calculation should be carried out every Sunday at 00:05:00 from now.

Configuration:

1. Activate the **Once a day every N days** option
2. **Number of days**: *7*
3. **Execute at:** *12:00:05 AM*
4. **Schedule starts at:** desired Sunday in the past

#### 12 TIMES A DAY

The calculation should be carried out from 1/1/2014 every 2 hours and 15 minutes after the hour.

Configuration:

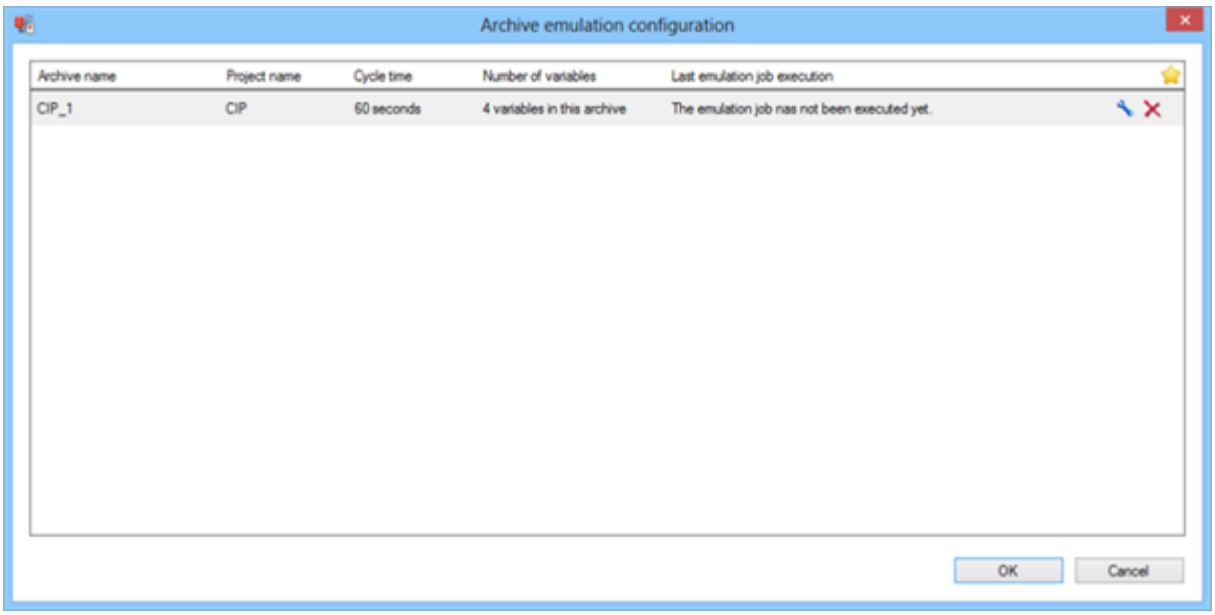
1. Activate the **Every N hours daily** option
2. **Per N hours every day**: *2*
3. **Starting at** *12:15:00 AM*
4. **Schedule starts on:** *1/1/2014*

## 16.3 Edit emulated archive

To edit an emulated archive:

1. If the dialog has not yet been opened, select the **Emulated archives** entry in the **SQL server** ribbon.

   The dialog for configuring emulated archives is opened.




2. Highlight the desired archive.

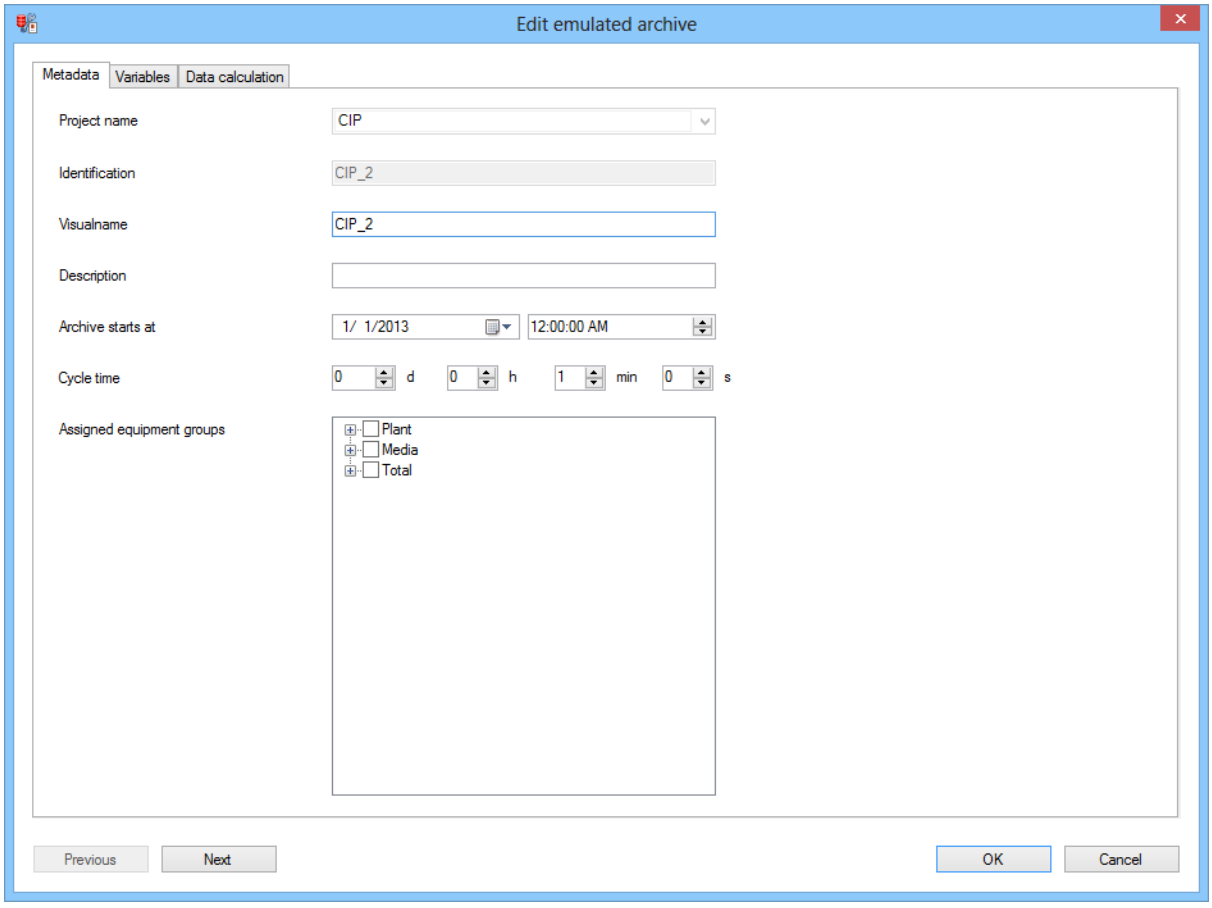
3. Click on the **Edit** button to change the configuration.

   The dialog for configuring an emulated archive is opened.

   **Note:** The settings that can be changed depend on the status of the archive (on page 373).

## EDITING A NEW ARCHIVE

A new archive has already been created and contains data, but was not yet written to the SQL server agent. This means: This dialog has not yet been closed since the first configuration.

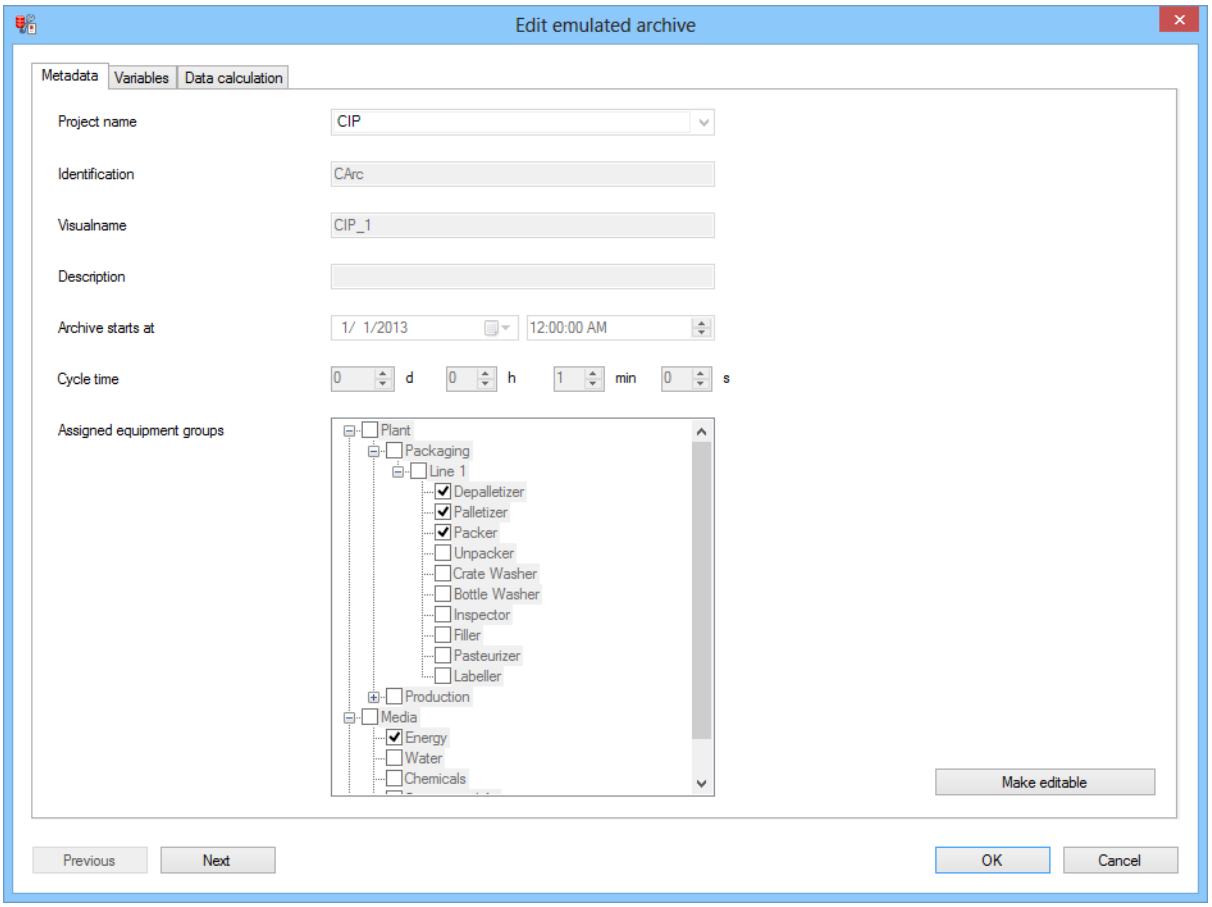



- Archive: All settings (on page 376) can be edited, with the exception of **Project** and **Identification**.
- Variables: All settings (on page 378) can be edited.

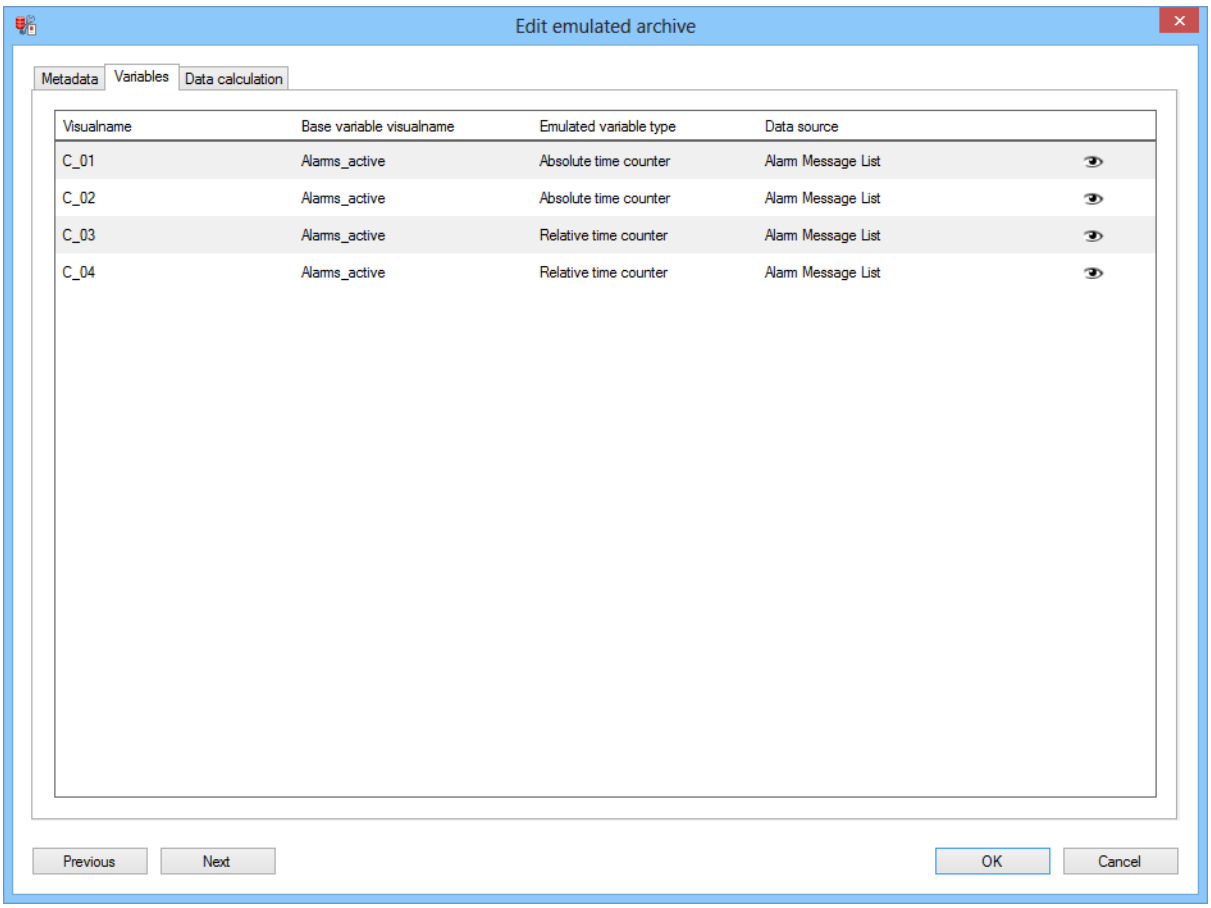
## EDITING A SAVED ARCHIVE

A saved archive is already created, contains data and was already written to the SQL server agent. This means: This dialog was closed after the initial configuration by clicking on **OK** and is now opened again.

- Archive: In the basic setting, only the **Data calculation** (on page 396) can be changed.
  The **Make editable** button can be used to edit the archive again, with the exception of the project allocation and name. This button is only available if the emulated archive has already been saved and has not been unlocked for editing again.
  For details, see the **Allow editing** section.



- Variables: Only displayed as read-only.




### MAKE EDITABLE

To edit an emulated archive that has already been saved again:

1. Click on the button **Make editable**
2. Confirm this when requested to do so.
3. The data in the **EMULATED_DATA** table is deleted.
4. Edit the archive and save it again.

## 16.4 Notes for report developers:

An emulated archive consists of metadata for archives and variables. They are calculated periodically according to the configuration via an SQL server agent job.

The following metadata, SPs and UDFs are used for emulated archives:

### METADATA

- Emulated_Archive
- Emulated_Variable
- Emulated_Variable_Configuration
- Emulated_Data
- Stored Procedures

### STORED PROCEDURES

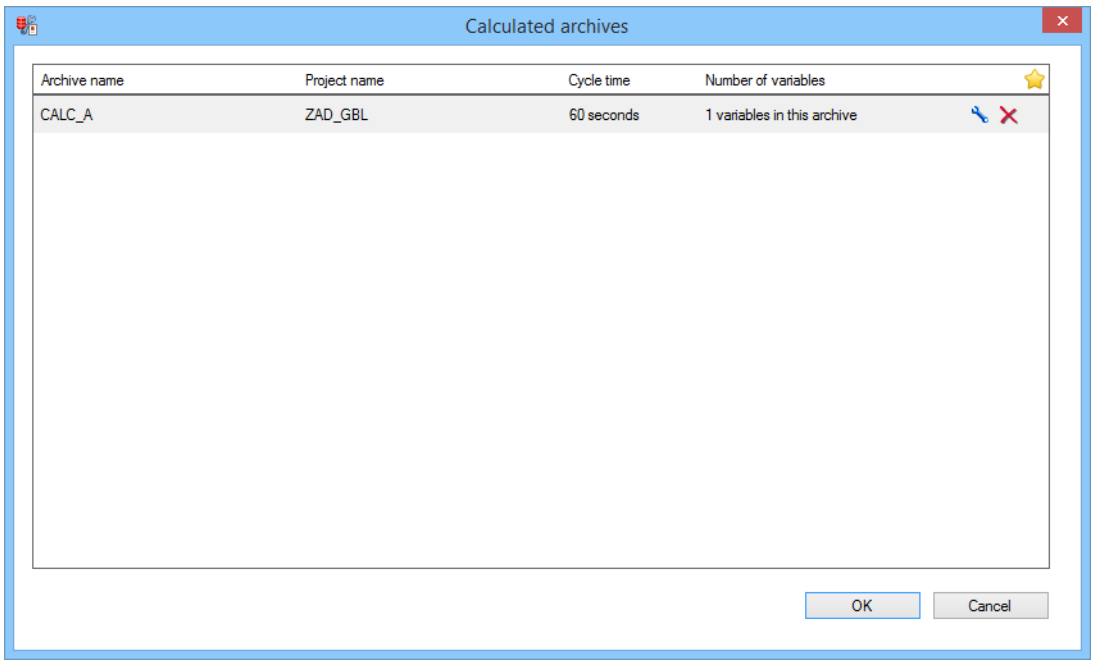
- CalculateEmulatedArchiveValues

### USER DEFINED FUNCTION BLOCKS

- GetTotalSeconds

# 17 Calculated archives

Calculated archives provide other reports with formulas with calculated values as an archive. In doing so, the data is not saved, but is alway recalculated again.




Clicking on the **New** (star) button opens the dialog to configure a new **calculated archive**.

**Key:**

- : **New**

- : **Edit**
- : **Delete**

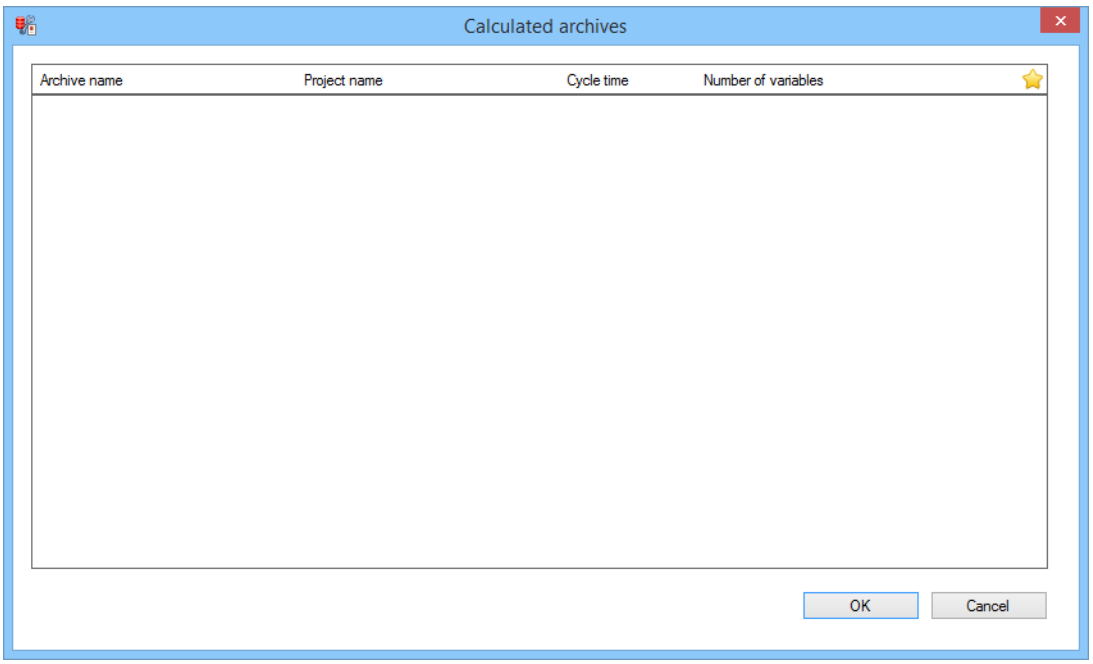
> **Information**
>
> Inputs in text fields are evaluated during configuration. Dialogs can be confirmed with **OK** if there are no validation errors.
>
> In general, the following applies:
>
> - The following are not permitted for display name, names, references identifications and meanings: Comma (,) and simple apostrophe (').
> - The following is not permitted for descriptions, units and status text: Comma (,)
>
> Errors are explained in pop-up messages.

## 17.1 Creating and editing a calculated archive

To start calculating archives:

1. Open the **SQL Server** menu.
2. Select the **Calculated archives** entry in the **Data processing** section.

   The dialog to create and configure calculated archives is opened:




**Key:**

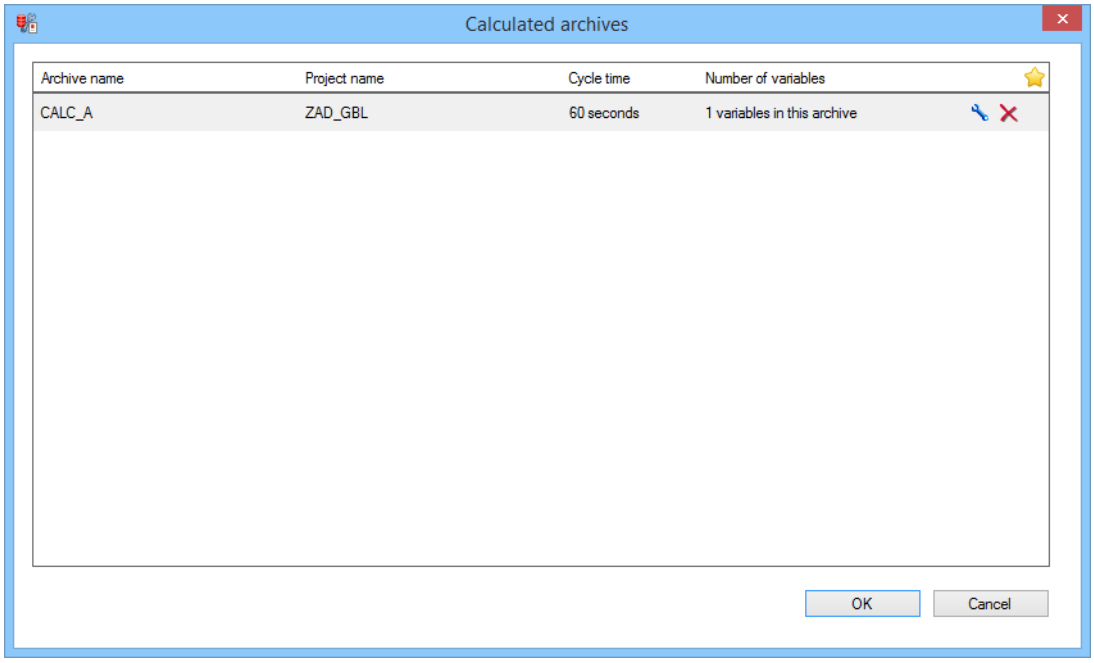
- New: ✚

3. Click on the symbol **New**:

   The dialog for configuration is opened.

4. Configure the **metadata** and **variables**.

   The new entry is added to the list.




**Key:**

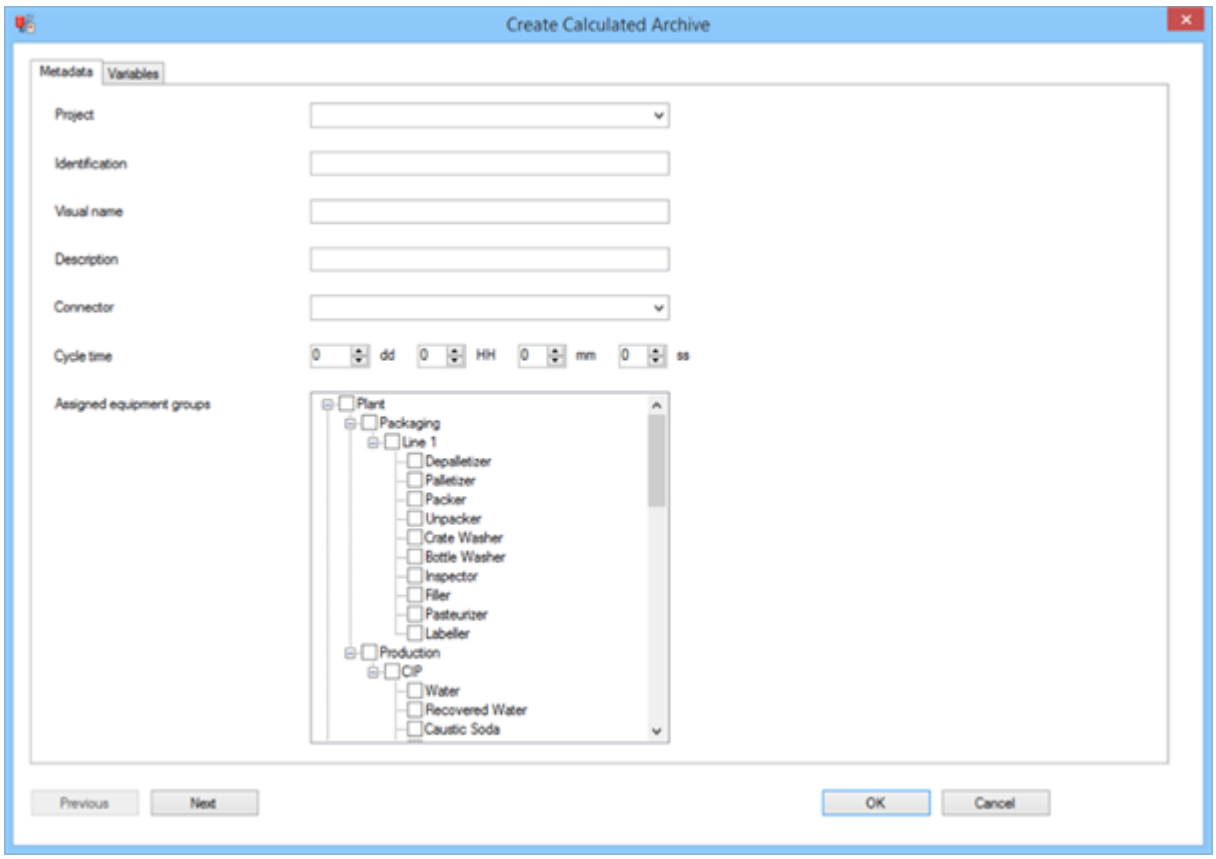
- ★: **New**
- 🔧: **Edit**
- ✕: **Delete**

| Option | Description |
|---|---|
| **List of calculated archives** | Lists all configured **calculated archives**. The list shows:<br>▸ **Archive name**: Visual name of the archive.<br>▸ **Project name**: Visual name of the project that is assigned to the archive<br>▸ **Cycle time**: Cycle time of the archive.<br>▸ **Number of variables**: Number of variables in the archive. |
| **Symbol new** | Clicking opens the dialog to configure a new **calculated archive** with the metadata tab. |
| **Edit symbol** | Clicking opens the dialog to configure the **calculated archive** in order |

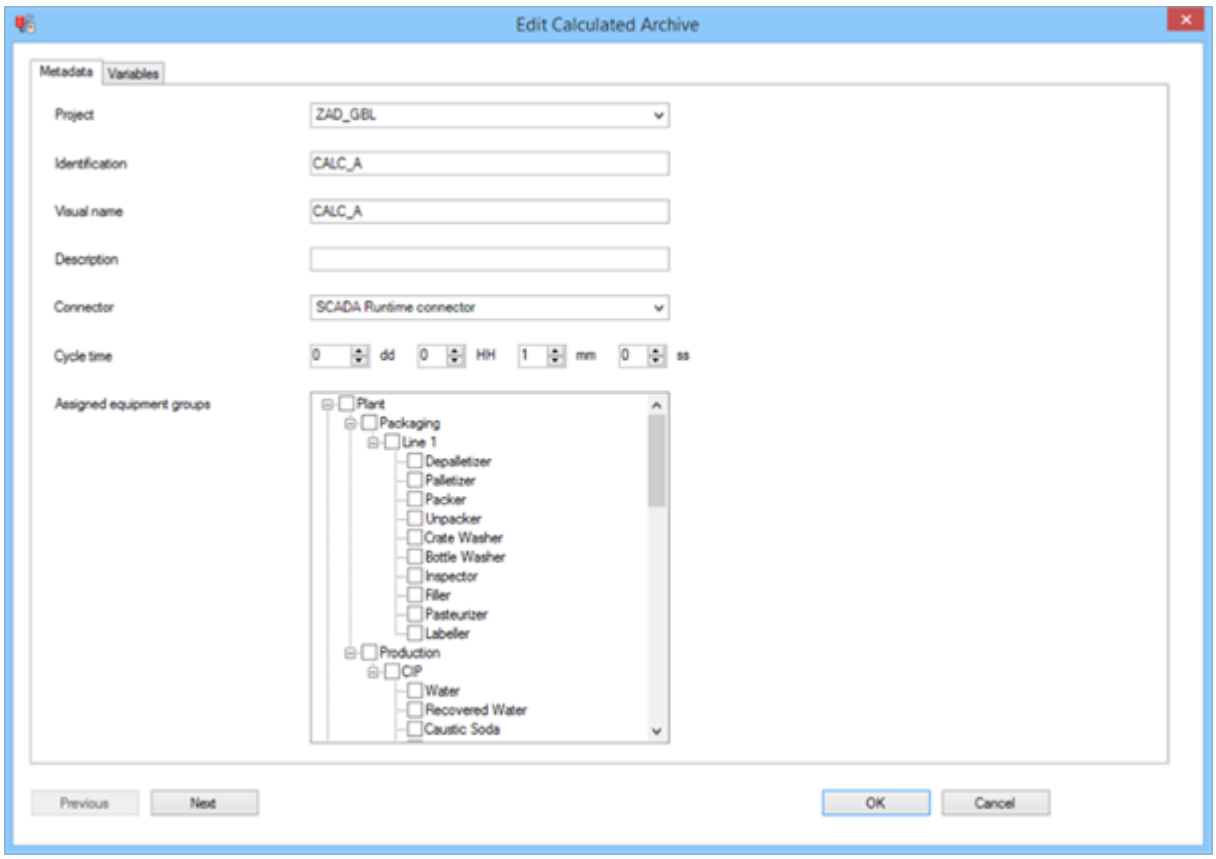
| Option | Description |
|---|---|
| | to make changes to the configuration. |
| **Delete symbol** | Clicking deletes the **calculated archive** and all variables calculated therein without requesting confirmation.<br>**Note:** The archive can only be deleted if it is not used by another virtual archive (**calculated archive, emulated archive, 3rd party database connector archive**). |
| **OK** | If clicked on, the dialog is closed and the changes are saved. |
| **Cancel** | If clicked on, the dialog is closed and the changes are discarded. |

### 17.1.1 Metadata

The archive metadata, the metadata and calculation tables of all variables contained in the archive are edited in this dialog.



If the dialog to edit an existing calculated archive is called up, the input elements in the dialog are initialized with the data of the archive.




| Option | Description |
|---|---|
| **Project** | Selection of the project that is assigned to the archive from a drop-down list. All variables in the **calculated archive** are automatically assigned to this project.<br>If this entry is changed, all variables configured for this are deleted.<br>**Note:** The drop-down list is deactivated if at least one variable of this archive is used by another virtual archive. |
| **Identification** | Input of the identification for the archive.<br>The field must not be empty during validation. |
| **Visual name** | Entry of the visual name for the archive.<br>The field must not be empty during validation. |
| **Description** | Optional description for the archive. |

| Option | Description |
|---|---|
| **Connector** | Connector to get the variable field data for the calculation of values. Select from drop-down list. |
| **Cycle time** | Input of the cycle time for the archive.<br>▸ *dd*: Days<br>▸ *HH*: Hours<br>▸ *mm*: Minutes<br>▸ *ss*: Seconds<br>Entry in the field or configuration using the arrow symbols. |
| **Assigned equipment groups** | Equipment groups to which the archive is assigned. Selection by activating the checkbox in front of the respective group. |

### NAVIGATION

| Button | Description |
|---|---|
| **Previous** | Switches to previous tab. (Deactivated in the first tab) |
| **Next** | Switches to the next tab. (Deactivated in the last tab) |
| **OK** | Applies all changes in all tabs and closes the dialog.<br>The button is deactivated if one of the required input fields is empty or not configured correctly. |
| **Cancel** | Discards all changes in all tabs and closes the dialog. |

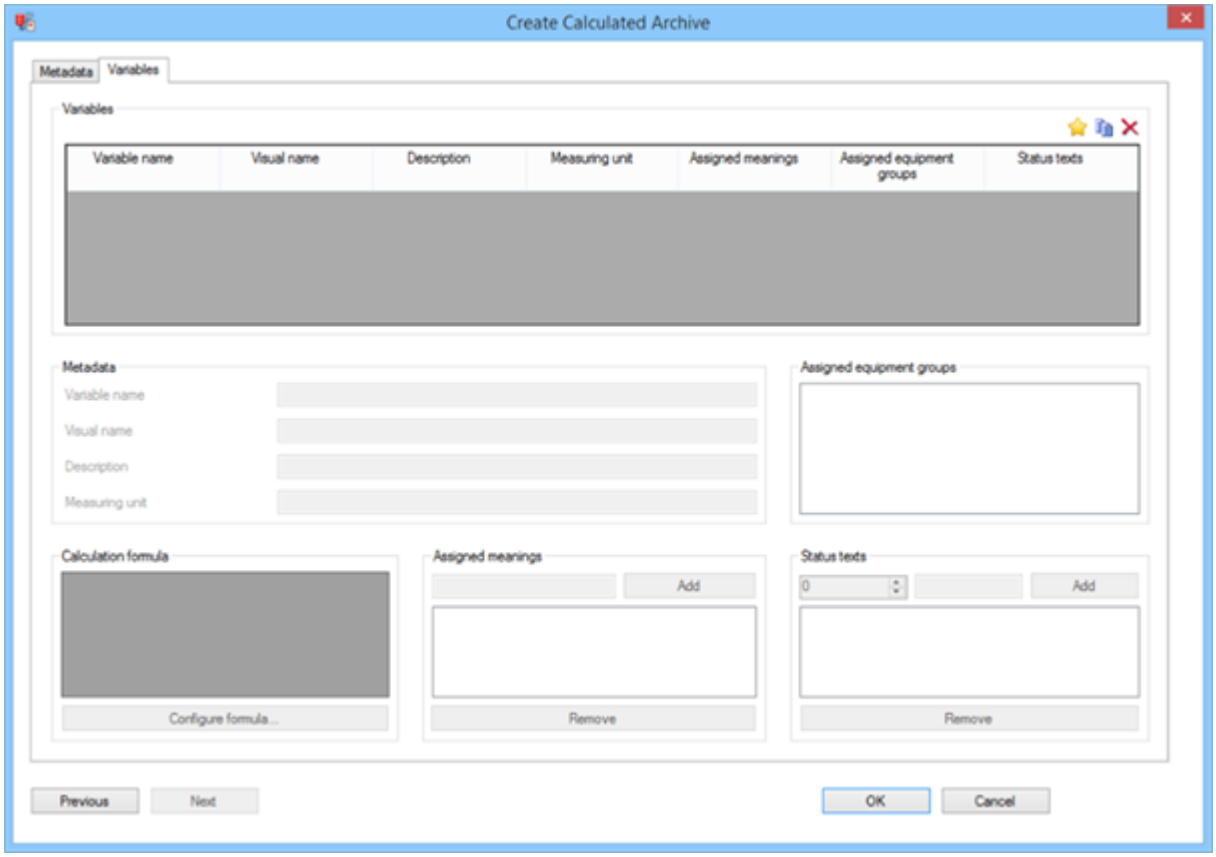
## VALIDATION

- The following entries must be occupied with the archive:
  - Project selection
  - Archive reference
  - Archive visual name
  - Connector
- Furthermore, the following archive entries must not have any conflicts with other archives in the global project:
  - Archive reference
  - Archive visual name

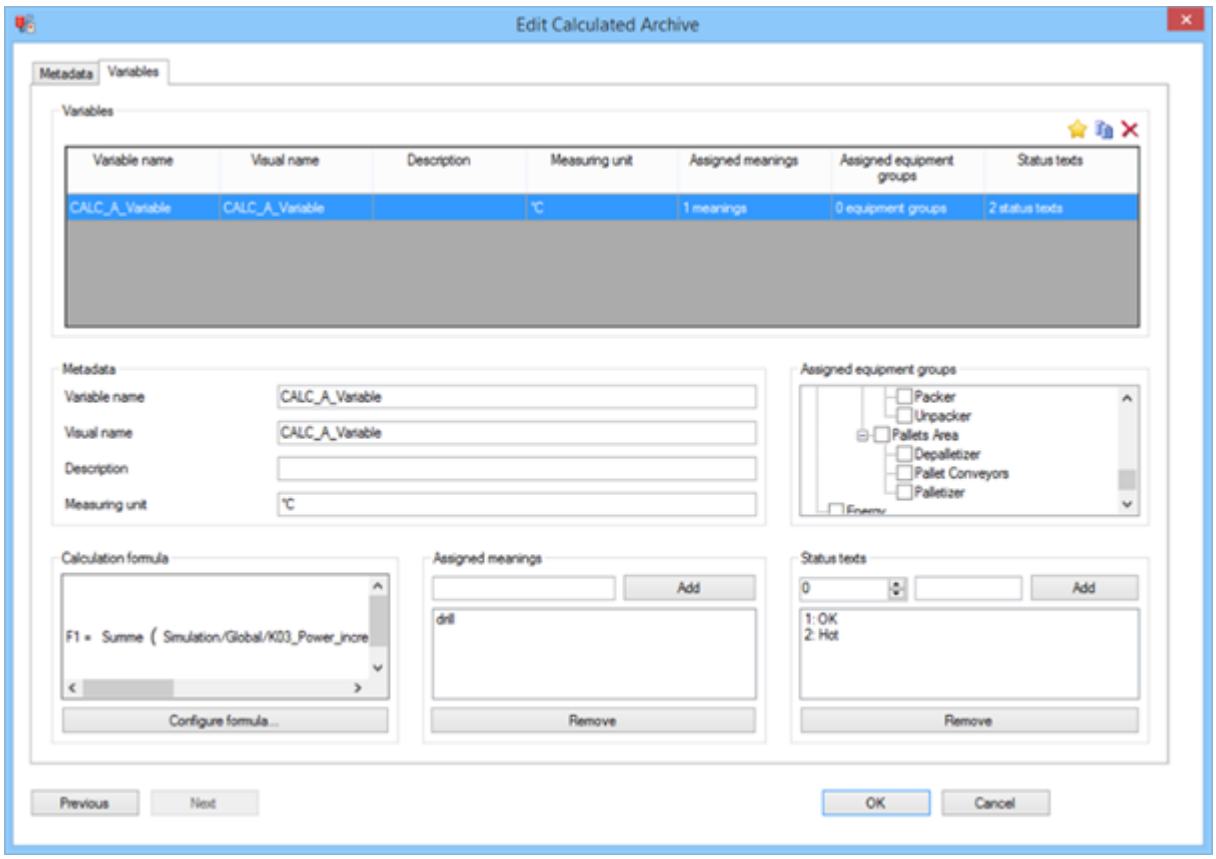
- With variables, the following rules must be adhered to for all variables:
  - The variable name and visual name must be filled and must not lead to conflicts with other variables of the same project
  - Each variable must have an active field for the value calculation.

## 17.1.2 Variables

Configuration of **calculated variables**.



If the dialog to edit an existing calculated archive is called up, the input elements in the dialog are initialized with the data of the archive.




**Key:**

New:

Duplicate:

Delete:

### VARIABLES

Display and creation of the **calculated variables**.

| Option | Description |
|---|---|
| **Symbol new** | Clicking on the symbol adds a new calculated variable to the list.<br><br>The variable name and variable visual name are generated automatically. Overlaps are avoided in the process.<br><br>The automatically-created entries can be amended in the **metadata** group. |

| Option | Description |
|---|---|
| **Duplicate symbol** | Clicking on the symbol duplicates all selected variables. The calculation formulas are also duplicated in the process.<br><br>Variable name and variable visual name are generated automatically based on the source variable. Overlaps are avoided in the process.<br><br>The automatically-created entries can be amended in the **metadata** group. |
| **Delete symbol** | All selected variables are deleted without requesting confirmation by clicking on the symbol.<br><br>Before deletion, a check is carried out to see whether one of the selected variables are used in a different archive. Deletion is refused if this is the case. |
| **List of variables** | The list contains all created variables with information on:<br>▸ Variable name<br>▸ Variable visual name<br>▸ Description<br>▸ Measuring unit<br>▸ Number of assigned meanings<br>▸ Number of assigned equipment groups<br>▸ Number of status names<br><br>Multiple selection of variables is possible in the list.<br>The following applies with multiple selection:<br>▸ Errors of the other input groups are always filled with the values of the first-selected variables.<br>▸ Changes in an input field in one of the other input groups have an effect on all selected variables. |

### METADATA

Configuration of the metadata for the variables.

| Option | Description |
|---|---|
| **Variable name** | Name of the variable.<br>▸ Must not be empty. |

| Option | Description |
|---|---|
| | ▸ Must be unique in the project.<br>Only available if precisely 1 variable has been selected. |
| **Visual name** | Visual name of the variables.<br>▸ Must not be empty.<br>▸ Must be unique in the project.<br>Only available if precisely 1 variable has been selected. |
| **Description** | Description of the variables. |
| **Measuring unit** | Unit of measurement the variables. |

### ASSIGNED EQUIPMENT GROUPS

Configuration of the equipment groups that are assigned to the variables.

| Option | Description |
|---|---|
| **Assigned equipment groups** | Selection of the equipment groups that are assigned to the variables. Selection by activating the checkbox in front of the group. |

### CALCULATION FORMULA

Configuration of the formula for the variable.

| Option | Description |
|---|---|
| **Formula field** | Shows formula of the calculated variables.<br>If no formula is displayed despite the configuration of the calculation, this can be caused by the following:<br>▸ No calculation field is assigned. This leads to a validation error.<br>▸ The calculation field is not a formula field, but a cost field for example. |
| **Configure formula** | Opens the dialog to configure custom formulas without aggregation. Only available if precisely one variable in the list has been selected.<br>The dialog is started in the mode for calculated archives. **Attention:** When configuring the formula, the **Field for** |

| Option | Description |
|---|---|
| | **calculated variables** option in the different tabs can only be selected once. This field must be a formula field. |

### ASSIGNED MEANINGS

Configuration and assignment of the meanings.

| Option | Description |
|---|---|
| **Meaning field** | Entry of a new meaning. |
| **Add** | Assigns the meaning from the **meaning field** to the variables. |
| **List of meanings** | Displays all configured meanings.<br>Multiple selection is possible. |
| **Remove** | Clicking on the button removes all meanings selected in the list. |

### STATUS NAMES

Configuration and assignment of the status names.

| Option | Description |
|---|---|
| **Numerical element** | Entry of the value of the status.<br>Must be unique. |
| **Input field** | Entry of the status text for this value.<br>Must be unique. |
| **Add** | Adds the entered value with the given status text into the list field.<br>Neither the value nor the text can already exist. |
| **List of status names** | Shows all existing entries. Multiple selection is possible.<br>Format: **[Value]:[Text]** |
| **Remove** | Clicking on the button removes all status names selected in the list. |

### NAVIGATION

| Button | Description |
|---|---|
| **Previous** | Switches to previous tab. (Deactivated in the first tab) |
| **Next** | Switches to the next tab. (Deactivated in the last tab) |
| **OK** | Applies all changes in all tabs and closes the dialog.<br>The button is deactivated if one of the required input fields is empty or not configured correctly. |
| **Cancel** | Discards all changes in all tabs and closes the dialog. |

# 18 User administration and access rights

The user administration for zenon Analyzer is organized in ZAMS. It consists of the administration of the:

- Access rights to Analyzer applications (on page 430)
- Access rights in Report Launcher (on page 435)
- Users with dedicated license (on page 427)

Set rights for users and objects in ZAMS and the Report Launcher are each set and applied after being confirmed in the dialog by clicking on **OK**.

Users can be administered throughout domains and in user groups. For **Users with dedicated license** and the administration of access rights for **Analyzer Tools**, each user must be individually administered in the selection dialog (on page 422). Administration according to groups is possible via the configuration of the filter for user groups. To do this, the user group is entered as a filter condition and then the user is selected.

For the administration of access rights in the **Report Launcher**, user groups can be selected directly in the selection dialog (on page 423).

## CHECKING THE USER LICENSES

ZAMS and Report Launcher check regularly to see whether a ZAMS license on the license server can be confirmed for the connected user on the connected Analyzer server.

If problems occur with the licensing or the connection, please note the checklist in the event of license problems (on page 18).

## 18.1 Configuration of user search

When calling up dialogs to assign a user profile, a user search is opened if no users have yet been stored in ZAMS. Here, you define how and in which locations users are to be searched for the population of the user list.

- Direct entry without validation:
  Entry of a user name for a domain without validation. This allows the addition of users from a domain by ZAMS users who do not have access to these domains. The Analyzer can thus, for example, be configured by an integrator locally and later be integrated into the customer's domain.
  To add a user directly:

  a) Install the Analyzer with a local user.

  b) Connect the computer to the domain.

  c) Open ZAMS with the existing user.

  d) In the **Analyzer Server** ribbon, click on **Analyzer applications**.

     The **search for users and groups** dialog is opened. If it is not displayed, then first delete the cache (on page 346).

  e) Activate the **Direct entry of user names (without checking)** radio button.

  f) Click on OK.

     The dialog for **configuring access rights** (on page 431) is opened.

  g) Click on Add.

     The **Direct entry of users and groups** (on page 420) dialog is opened.

  h) Enter the complete user name according to the syntax: *Domain\User name*.

  i) Click on OK.

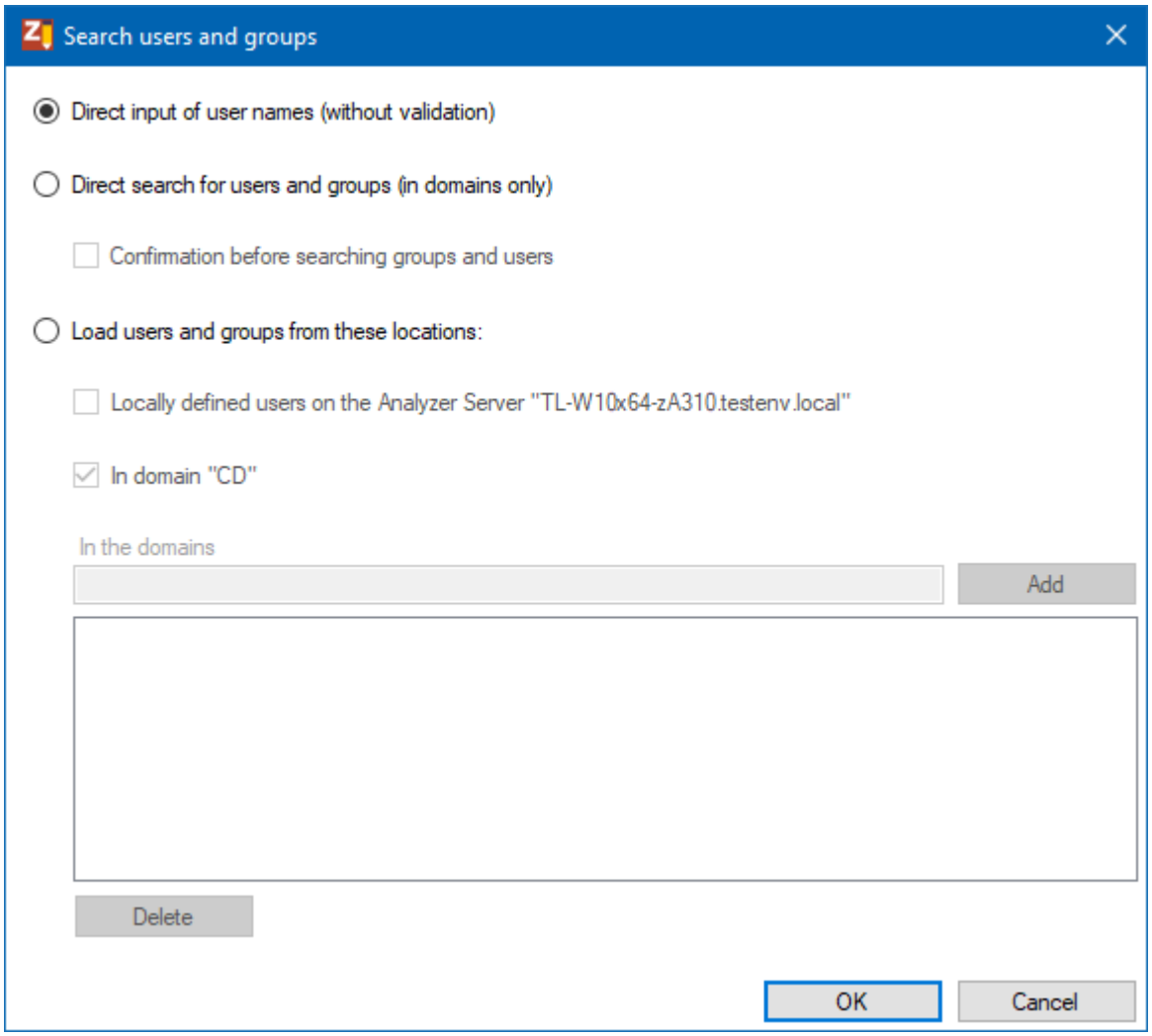
     The entry is applied and the dialog is closed.
     The ZAMS user now has access to the domains.

- Direct query:
  Targeted query of the domains and the caches only once users have been added. For this, the following applies:

  - Groups are only available in the filters if they are present in the cache. They must therefore have already been called up - regardless of whether they have been added.
  - Users and groups that have been found are cached.
  - Users defined locally on the Analyzer server cannot be added.
  - Groups defined locally on the Analyzer server cannot be added or filtered.

- Cache users and groups
  When first querying users, all users and groups of the defined domains are searched for locally and cached. With domains with many users and groups, this can take a long time.

## DIALOG FOR SEARCHING FOR USERS AND GROUPS




| Option | Description |
|---|---|
| **Direct input of user names (without validation)** | Entry of a user name for a domain without validation. The domain and user name are added via the **Configuration of access rights** (on page 431).<br><br>If a group is entered instead of a user, the group is entered as user. This leads to unusable configurations when configuring access rights for Analyzer applications and when assigning fixed licenses. However, groups can also be added for |

| Option | Description |
|---|---|
| | the Report Launcher.<br><br>**Attention:** There is no validation of the entries. Incorrect entries lead to the Analyzer Server not being able to be properly logged into the domain. |
| **Direct search for users and groups (in domains only)** | ▸ *Active*: Users and groups are only searched for as required. |
| **Confirmation before searching groups and users** | ▸ *Active*: If no user is found when an object is searched for, a request for confirmation is made for a further search.<br><br>**Background:** If no user is found in the domain, a search for a group is carried out. If a group is found, all users contained if the group are searched for. This can take a long time.<br><br>Only available if **Direct search for users and groups** has been activated. |
| **Load users and groups from these locations:** | ▸ *Active*: Users and groups are searched for and updated immediately. This can take a long time with large domains. |
| **Users defined locally on the Analyzer Server "[computer name]"** | ▸ *Active*: A search for defined users and user groups is carried out locally on the Analyzer server.<br><br>Only available if **Load users and groups from these locations:** has been activated. |
| **In the domain "[domain name]"** | ▸ *Active*: A search for domain users and user groups is carried out in the domain of the currently-connected user.<br><br>Detection takes place in three steps:<br>▸ Firstly, an attempt is made to return the names of the domains in which the user is defined.<br>▸ If this is unsuccessful, an attempt is made to return the names of the domains in which the computer is integrated.<br>▸ If this is unsuccessful, the computer name is returned. |

| Option | Description |
|---|---|
| | Only available if **Load users and groups from these locations:** has been activated. |
| **In the domains** | Entry of a domain in which a search for users and user groups is to be carried out. Accept by clicking on the **Add** button.<br>Only available if **Load users and groups from these locations:** has been activated. |
| **Add** | Adds the domains stated in the **In the domains** input field to the **list of domains**.<br>The entry is only accepted if it:<br>▸ Is not yet in the list<br>▸ Is not identical to the domain of the user who is currently connected<br>▸ Is not identical to the Analyzer Server computer name<br>Capitalization of letters is not taken into account during the check. |
| **List of domains** | Contains the domains that have been individually added. Multiple selection is possible. |
| **Delete** | Deletes all highlighted domains from the **list of domains**. |
| **OK** | Accepts and validates the configuration, closes the dialog and starts the search. |
| **Cancel** | Discards the configuration and closes the dialog. |

**Note:** The selected setting is saved in the ZAMS configuration and selected as a presetting the next time the dialog is displayed. The selected setting applies for the complete ZAMS session.

## DELETE THE CACHE OF THE USER SEARCH

To change the type of search, either ZAMS must be restarted or the cache must be deleted.

To delete the cache of the user search:

1. Open the Options (on page 29) ribbon.
2. Select the **Delete** entry in the **Cache** ribbon group.

Cached users and groups are removed from the cache.

The next time a dialog to call up user administration is called up, the dialog to configure the user search is called up again

## 18.2 Selection of users and user groups

Users and user groups are added differently depending on the configuration of the search (on page 415):

- Direct input: Direct entry of user names (on page 420) if the logged-in ZAMS user has no access to the domain. The computer must be connected to the domain.
- Direct query: The **Search for users and user groups dialog** (on page 421) is opened. If a user is found, they are added. If a group is found, all members of this group are added.
- Users and groups cached: The **Select users and user groups dialog** (on page 423) is opened. Cached users and groups are offered for selection.

When configuring the access rights for the Report Launcher (on page 435), user groups and users can be selected from groups. For all other dialogs for user rights, users can be selected from groups, but not user groups.

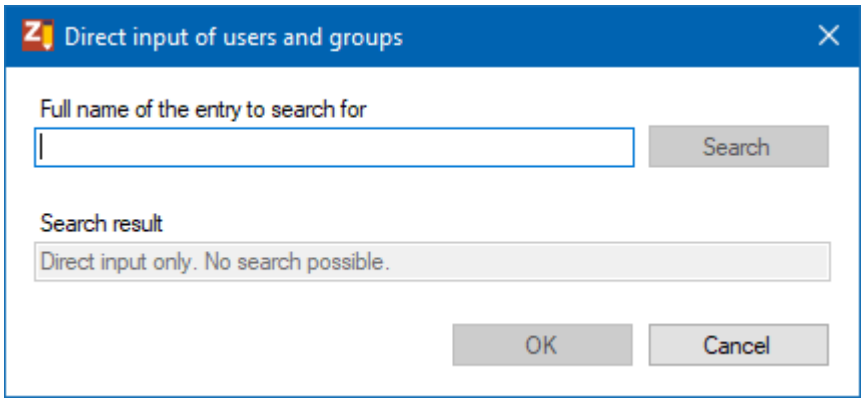
### PROCEDURE

The following applies when obtaining user data:

- If two users have the same visual name, the reading of the user data source that is currently being read is canceled.
- If two user groups have the same visual name, the reading of the user data source that is currently being read is canceled.
- If a group has the same visual name as a user, the user group concerned is ignored. However the reading is continued.

## 18.2.1 Direct input of users and groups dialog

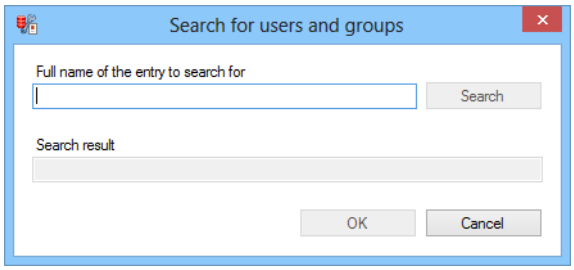
If, in the dialog to select users, the **Direct entry of user names (without checking)** option is selected, this dialog is called up when adding a new user:




| Option | Description |
|---|---|
| **Full name of the entry to search for** | Entry of the complete name of the user to be entered. This consists of:<br>▸ Domain<br>▸ Backslash<br>▸ User name<br>Example: **MAIN\J.Doe**<br>**Attention:** Incorrect entries lead to the Analyzer Server not being able to be connected to the domain and the user not being able to be logged on. |
| **Find** | Not available, because there is no validation. |
| **Search result** | Not available, because there is no validation. |
| **OK** | Accepts the entered user with no further validation. |
| **Cancel** | Closes the dialog without accepting any users. |

## 18.2.2 Search for users and user groups dialog

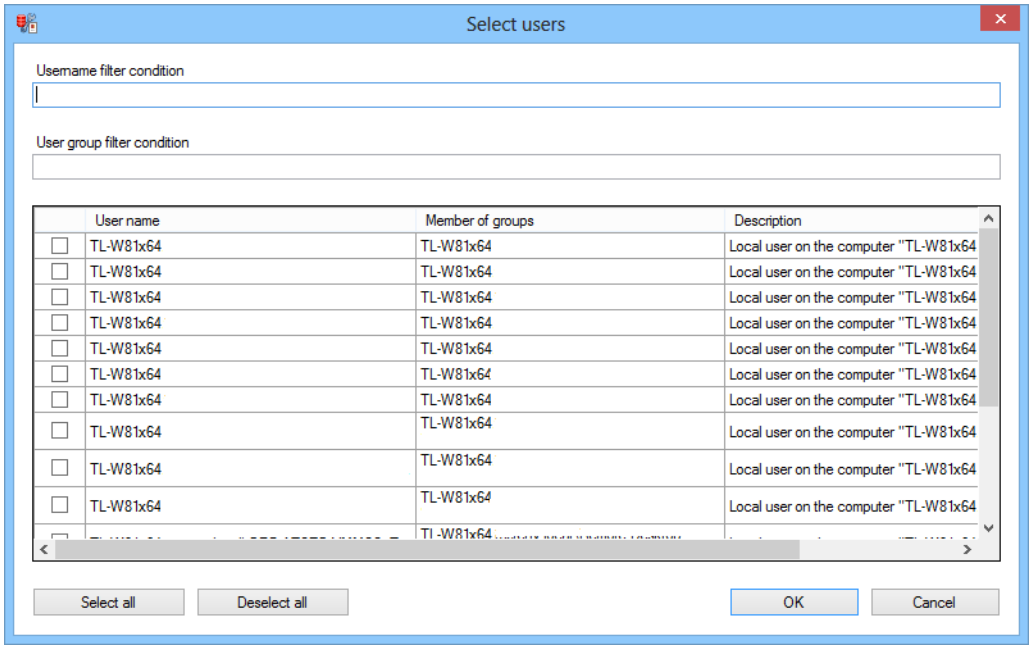
If, when configuring the user rights with a direct query, a search for a user or a user group is carried out, the search dialog is opened:




| Option | Description |
|---|---|
| **Full name of the entry to search for** | Entry of the complete name of the object to be searched for. This consists of:<br>▸ Domain<br>▸ Backslash<br>▸ User name<br>Example: **MAIN\J.Doe** |
| **Find** | Clicking on this starts the search for the search term entered.<br>Only active if:<br>▸ The input field is not empty<br>▸ The content has been changed since the last user<br>If the user is not found in the domain, there is a query to see if all user names of the domain are to be searched for. |
| **Search result** | Displays the search result. |
| **OK** | Accepts the user who has been found or all who have been found to the dialog.<br>Only available if the input field for the complete name has not been changed since the last successful search. |
| **Cancel** | Closes the dialog without accepting any users. |

## 18.2.3 Select user dialog

If new user users are added in a configuration dialog for user rights, the following dialog is called up. Exception: When configuring the access rights for the Report Launcher, the **Select users and user groups dialog** (on page 423) is called up.)




| Option | Description |
|---|---|
| **Username filter condition** | Input of filter conditions for user names.<br>The list of the users displayed is updated each time a change is made in the input field. Only users who meet the filter criteria in the text with one of their name properties are displayed. Filtering is carried out:<br>▸ partially: it is sufficient if the character sequence appears in the name<br>▸ Without taking capitalization into account<br>Already-selected users are not hidden. |
| **User group filter condition** | Input of filter conditions for user groups.<br>The list of the users displayed is updated each time a change is made in the input field. Only users that belong to one of the user groups that meet the condition are shown. Filtering is carried out:<br>▸ partially: it is sufficient if the character sequence appears in the name<br>▸ Without taking capitalization into account |

| Option | Description |
|---|---|
| | Already-selected users are not hidden. |
| **Checkboxes** | *Active*: User is selected for adding. |
| **User List** | Display of the users available for selection. This list is compiled according to the settings in the configuration of user search (on page 415).<br>It contains:<br>▸ **Username**: Display of the user name.<br>▸ **Member of groups**: Display of the user groups that a user belongs to.<br>▸ **Description**: Displays information on the user name and its origin. |
| **Select all** | Clicking on the button selects all displayed users according to the filter conditions. |
| **Deselect all** | Clicking on the button deselects the selection. |
| **OK** | Accepts selection, closes the dialog and adds selected users. |
| **Cancel** | Discards all changes and closes the dialog. |

The size and position of the dialog can be changed. These settings are saved as user-dependent.

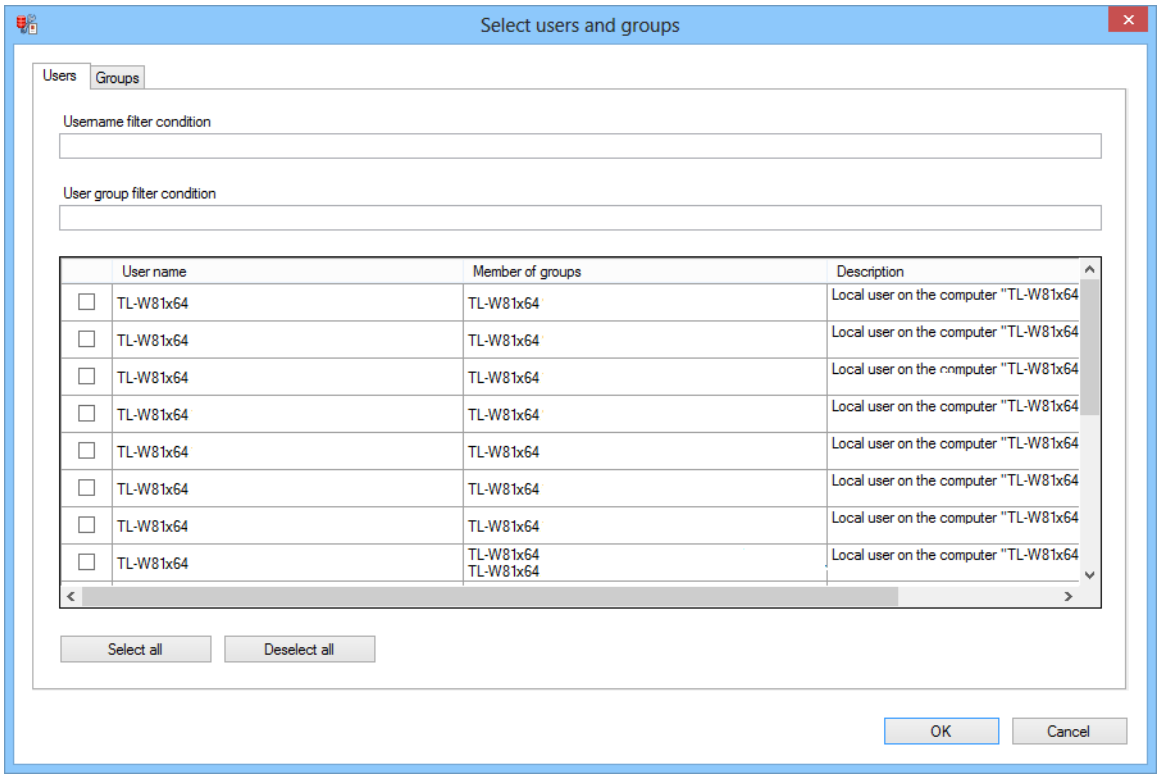
## 18.2.4 Dialog for selecting users and user groups

If new users or user groups are added in the configuration dialog for the access rights for the Report Launcher, a selection dialog is called up. It is possible to add using two tabs:

- Users
- Groups

## USERS

Selection of users who are to be added.



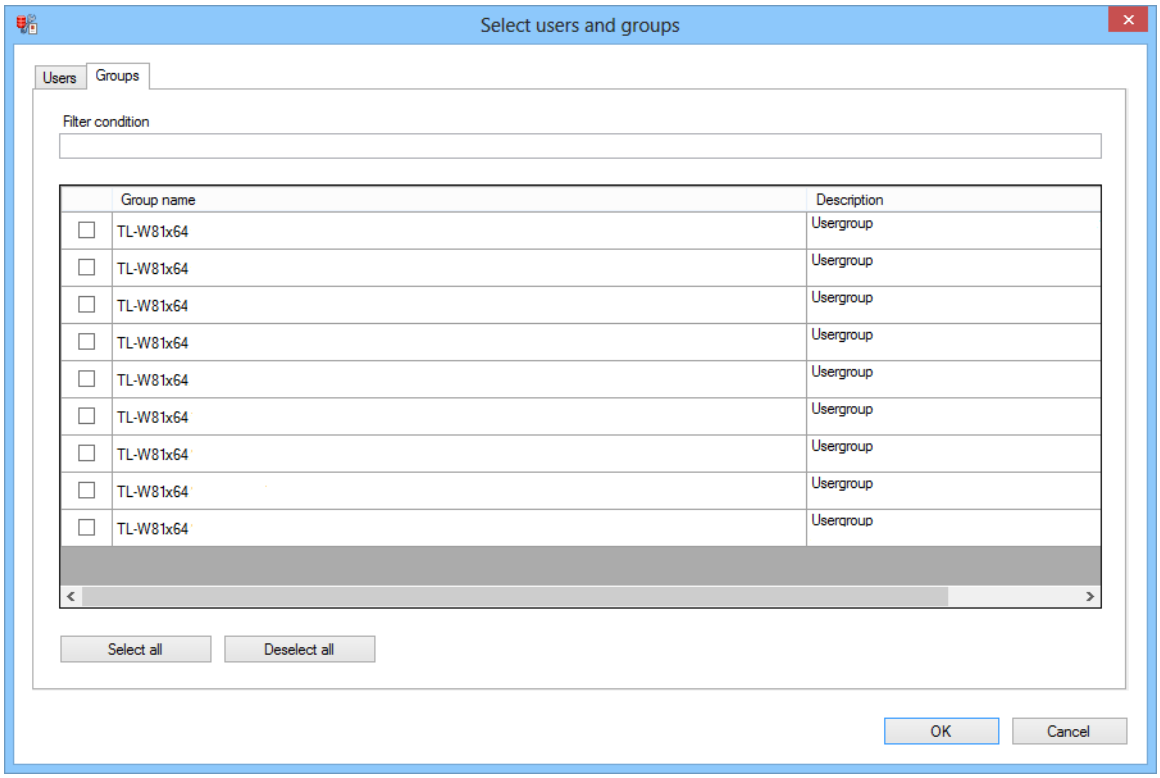

| Option | Description |
|---|---|
| **Username filter condition** | Input of filter conditions for user names.<br><br>The list of the users displayed is updated each time a change is made in the input field. Only users who meet the filter criteria in the text with one of their name properties are displayed. Filtering is carried out:<br><br>▸ partially: it is sufficient if the character sequence appears in the name<br><br>▸ Without taking capitalization into account<br><br>Already-selected users are not hidden. |
| **User group filter condition** | Input of filter conditions for user groups.<br><br>The list of the users displayed is updated each time a change is made in the input field. Only users that belong to one of the user groups that meet the condition are shown. Filtering is carried out:<br><br>▸ partially: it is sufficient if the character sequence appears in the name<br><br>▸ Without taking capitalization into account |

| Option | Description |
|---|---|
| | Already-selected users are not hidden. |
| **Checkboxes** | *Active*: User is selected for adding. |
| **User List** | Display of the users available for selection. This list is compiled according to the settings in the configuration of user search (on page 415).<br>It contains:<br>▸ **Username**: Display of the user name.<br>▸ **Member of groups**: Display of the user groups that a user belongs to.<br>▸ **Description**: Displays information on the user name and its origin. |
| **Select all** | Clicking on the button selects all displayed users according to the filter conditions. |
| **Deselect all** | Clicking on the button deselects the selection. |
| **OK** | Accepts selection, closes the dialog and adds selected users. |
| **Cancel** | Discards all changes and closes the dialog. |

The size and position of the dialog can be changed. These settings are saved as user-dependent.

## GROUPS

Selection of user groups that are to be added.




| Option | Description |
|---|---|
| **Filter condition** | Input of filter conditions for user groups.<br><br>The list of the user groups displayed is updated each time a change is made in the input field. Only the respective user groups that meet the condition are still shown. Filtering is carried out:<br><br>▸ partially: it is sufficient if the character sequence appears in the name<br><br>▸ Without taking capitalization into account<br><br>Already-selected user groups are not hidden. |
| **Checkboxes** | *Active*: User group is selected for adding. |
| **List of user groups** | Display of the user groups available for selection. This list is compiled according to the settings in the configuration of user search (on page 415).<br><br>It contains:<br><br>▸ **Group name**: Display of the user groups that a user belongs to. |

| Option | Description |
|---|---|
| | ▸ **Description**: Displays information on the user name and its origin. |
| **Select all** | Clicking on the button selects all displayed user groups according to the filter conditions. |
| **Deselect all** | Clicking on the button deselects the selection. |
| **OK** | Accepts selection, closes the dialog and adds selected user groups. |
| **Cancel** | Discards all changes and closes the dialog. |

The size and position of the dialog can be changed. These settings are saved as user-dependent.

## 18.3 Users with dedicated license

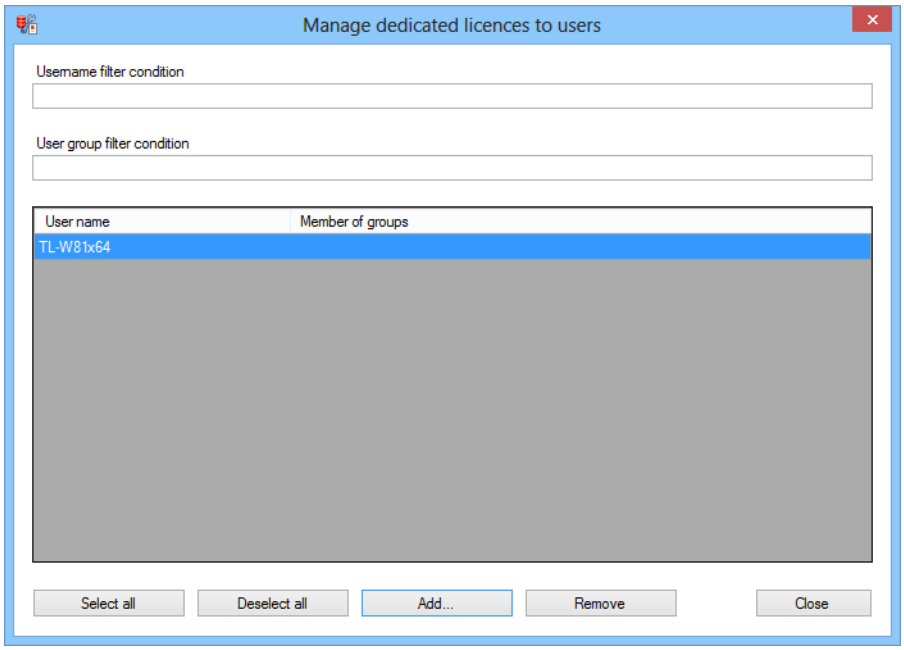
Users can have dedicated licenses in ZAMS. A license is always kept free for these. A user with a dedicated license thus also has a client license on the license server if they are not connected. The maximum number of users who can be created with a fixed license is the amount of client licenses present. When entering a new zenon Analyzer license, it is only accepted if you have enough client licenses for all users with a dedicated license.

### MANAGE DEDICATED LICENSES TO USERS

To assign or remove a user's dedicated license:

1. Open the **Analyzer Server** ribbon.
2. Select the **License reservation** entry in the **User administration** ribbon group.

The dialog to administer the users with a fixed license is opened.




| Option | Description |
|---|---|
| **Username filter conditions** | Input of filter conditions for user names.<br>The list of the users displayed is updated each time a change is made in the input field. Only users who meet the filter criteria in the text with one of their name properties are displayed. Filtering is carried out:<br>▸ partially: it is sufficient if the character sequence appears in the name<br>▸ Without taking capitalization into account<br>Already-selected users are not hidden. |
| **User group filter conditions** | Input of filter conditions for user groups.<br>The list of the users displayed is updated each time a change is made in the input field. Only users that belong to one of the user groups that meet the condition are shown. Filtering is carried out:<br>▸ partially: it is sufficient if the character sequence appears in the name<br>▸ Without taking capitalization into account<br>Already-selected users are not hidden. |
| **User List** | Displays all configured users with a dedicated license. Belonging to |

| Option | Description |
|---|---|
| | a user group is also shown.<br><br>Multiple selection is possible:<br>▸ **Ctrl key + mouse click**: selects an additional user with each click<br>▸ **Ctrl key + mouse click**: selects all users who are between two clicks, from<br>▸ Clicking on the **Select all** button selects all users in the list |
| **Select all** | Selects all users who are displayed in the **List of users**. |
| **Deselect all** | Deselects the users who are displayed in the **List of users**. |
| **Add** | Opens, depending on the **configuration of the user search** (on page 415), a dialog to select users:<br>▸ Direct input:<br>The **Direct entry of users and groups** (on page 420) dialog is opened here. This allows the direct entry of user names and user groups if the logged-in ZAMS user has no access to the domain. The computer must be connected to the domain.<br>▸ Direct query:<br>The **Search for users and user groups dialog** (on page 421) is opened. If a user is found, they are added. If a group is found, all members of this group are added.<br>▸ Users and groups cached:<br>The **Select users and user groups** (on page 423) dialog is opened. Cached users and groups are offered for selection.<br><br>Users can only be added if there are sufficient licenses available. In the dialog to add users, all users who already have a corresponding license are filtered out. The dialog is only opened if at least one further user can be added. Note the corresponding message in the output window. |
| **Remove** | Deletes selected users from the list without requesting confirmation.<br><br>The successful removal of a user is documented in the output window, as is unsuccessful removal. |
| **Close** | Closes the dialog. |

The size and position of the dialog can be changed. These settings are saved as user-dependent.

## 18.4 Basic principles of user access rights

There are four user authorization levels internally. Each level includes access to the permitted applications of the lower levels, however it defines its own data access rights. In the dialogs, the applications that are linked to the authorization levels are named instead of the authorization levels. As a result of the fact that access rights on the Report Launcher are handled separately from the access rights to the Analyzer tools - and thus to the database - it is also possible that, for example, a user can enter prices and norm values, but does not have access to the objects on the Analyzer server.

The four authorization levels:

- *0*: Users can only have a license for the Report Launcher.
  This authorization level is automatically issued to each user.

  Users with this authorization level have no database access.
- *1*: User can, in addition to the authorization level *0* applications, also use the Editor tool for price and norm values.

  These users each receive a login at user level in the SQL server instance. In each Analyzer metadata database on the SQL server instance, these users are each a user with read rights for all tables and write rights for the tables **PRICE** and **NORM**.
- *2*: Users can also use, in addition to authorization level 1 applications, the **Metadata Editor** and the **Analyzer Export Wizard**.

  The Wizard does not have a license for the user running it, but it must however have the corresponding database access rights that are usually granted with this authorization level. These users each receive a login at user level in the SQL server instance. In each Analyzer metadata database on the SQL server instance, these users are each a user with read rights for all tables and write rights for all tables.
- *3*: Users can also use ZAMS in addition to authorization level *2* applications.

  These users each receive a login at administration level in the SQL server instance. With the administrator login, these users are automatically given administrator access rights to all databases in the SQL server instance by the SQL server, including to non-Analyzer metadata databases. These users are therefore administrators on the SQL server instance, because they must create new databases, create, change and delete stored procedures and user-defined functions, administer indices, back up and restore databases, enter internal code into databases and administer user rights.

## 18.5 Access rights to Analyzer applications

The Analyzer applications include:

- **Manual Data Editor**
- **Metadata Editor**

- **ZAMS**

The access rights to these applications are managed for all users in a dialog. In doing so, the appropriate access rights to all Analyzer metadata databases on the currently-active SQL server instance are regulated.

### Information

Access right, in the context of Analyzer applications, means that a user can connect to the Analyzer server with the application.

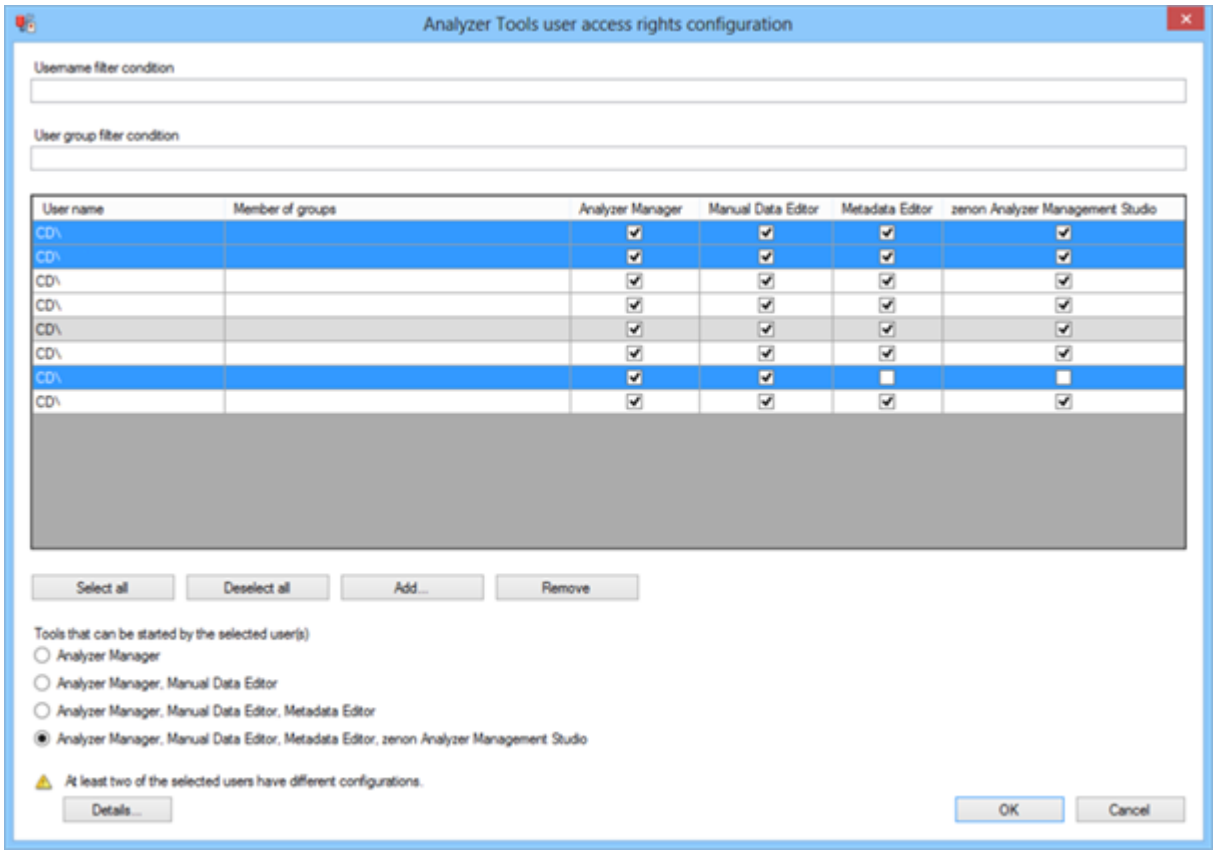
This means: A user can be a user with authorization level *3* on Analyzer Server A and at the same time be a user with authorization level *1* on Analyzer server B.

## 18.5.1 Configuration of the access rights

To configure the access rights to the Analyzer applications:

1. Open the **Analyzer Server** ribbon.
2. Select the **Analyzer applications** entry in the **User administration** ribbon group.

   The dialog for configuring access rights is opened.



| Option | Description |
|---|---|
| **User name filter condition** | Input of filter conditions for user names.<br><br>The list of the users displayed is updated each time a change is made in the input field. Only users who meet the filter criteria in the text with one of their name properties are displayed. Filtering is carried out:<br><br>▸ partially: it is sufficient if the character sequence appears in the name<br><br>▸ Without taking capitalization into account<br><br>Already-selected users are not hidden. |
| **Filter condition** | Input of filter conditions for user groups.<br><br>The list of the users displayed is updated each time a change is made in the input field. Only users that belong to one of the user groups that meet the condition are shown. Filtering is carried out:<br><br>▸ partially: it is sufficient if the character sequence appears in the name<br><br>▸ Without taking capitalization into account<br><br>Already-selected users are not hidden. |
| **User list** | Display of all configured users.<br><br>The following is displayed for each user:<br><br>▸ The user groups they belong to.<br><br>▸ Authorizations for Analyzer applications. For details, see also the **Basics of user access rights** (on page 430) section. Authorizations can be changed by selecting the option fields in the **Applications that can be used by the currently-highlighted users** area.<br><br>Users with authorization levels *0* (Report Launcher) are not displayed, because the license server grants this to all level *0* users anyway.<br><br>**Note:** The user currently connected is shown with a gray background. Their rights cannot be changed. This prevents all users of SQL Server being locked out due to incorrect configuration. |
| **Select all** | Clicking on the button selects all displayed users according to the filter conditions. |
| **Clear selection** | Clicking on the button deselects the selection. |

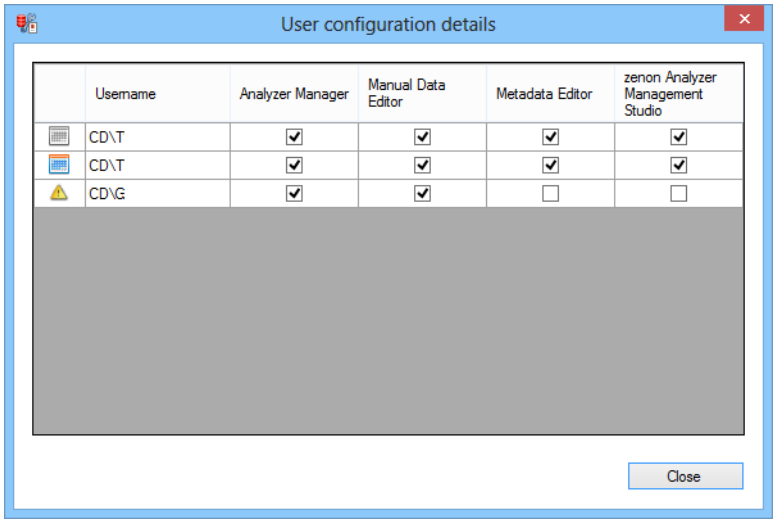
| Option | Description |
|---|---|
| **Add** | Opens, depending on the **configuration of the user search** (on page 415), a dialog to select users:<br>▸ Direct input:<br>The **Direct entry of users and groups** (on page 420) dialog is opened here. This allows the direct entry of user names and user groups if the logged-in ZAMS user has no access to the domain. The computer must be connected to the domain.<br>▸ Direct query:<br>The **Search for users and user groups dialog** (on page 421) is opened. If a user is found, they are added. If a group is found, all members of this group are added.<br>▸ Users and groups cached:<br>The **Select users and user groups** (on page 423) dialog is opened. Cached users and groups are offered for selection.<br>Users who have already been added are filtered out in the dialog. The dialog is only opened if at least one user can be added. |
| **Remove** | Deletes the selected users from the list without requesting confirmation.<br>The removal of a user is the same as setting the user to authorization level *0* (Report Launcher) because the license server grants level *0* to all users and the database access rights of the user can be deleted in both cases. |
| **Applications that can be used by the currently-selected users** | Selection of the authorization levels for the users selected in the list. The levels are arranged in a hierarchy. Level *1* elements are also included in level *2*. Level *0* (Report Launcher) is given to all users. Rights for the Report Launcher are administered using the **Report Launcher access rights** (on page 435).<br>Authorization levels:<br>▸ Manual Data Editor: Level 1.<br>Users can use the editor tool for price and norm values.<br>▸ Metadata Editor: Level *2*.<br>Users can also use the **Metadata Editor** and the **Analyzer Export Wizard**.<br>▸ zenon Analyzer Management Studio.<br>Level *3*. Users can also use ZAMS.<br>If several users are highlighted in the table, the authorization levels |

| Option | Description |
|---|---|
| | of the last-selected user are displayed. If no user is selected or the user who is currently connected is selected, the authorization level cannot be set.<br><br>For details on the access levels, see also the **Basics of user access rights** (on page 430) section.<br><br>**Attention:** If several users are highlighted, the amended configuration is set for all highlighted users in the event of a configuration change, regardless of whether it currently has different configurations. |
| **Warnings** | Only visible if errors are present. Consists of: Warning symbol, text with warning notice and button to display the details.<br><br>Condition for display of warnings:<br>▸ The currently-connected user was selected for a configuration change.<br>A warning notice is displayed. The button is not visible.<br>▸ Two or more of the selected users have different configurations. The warning notice is displayed. Clicking on the **Details** button opens a window with details (on page 435) on the warning.<br><br>**Attention:** The display of a warning means that changes to the configuration and the confirmation of these also makes changes for objects with an original configuration that is different to the configuration displayed here. The original configuration for these objects is then lost. |
| **OK** | Applies configuration and closes the dialog. |
| **Cancel** | Discards all changes and closes the dialog. |

The size and position of the dialog can be changed. These settings are saved as user-dependent.

### 18.5.2 Warning details for different user access rights

If users with different settings are selected for joint configuration, a warning notice is shown in the dialog to configure the access rights (on page 431). The details are shown in a separate window. No inputs can be made in this dialog:




| Option | Description |
|---|---|
| **User List** | Display of all configured users.<br>The first column shows the type of warning:<br>▸ Gray circle: Basis for comparison. The configuration is selected on the basis of the last selected user.<br>▸ Yellow triangle: Differs from the comparison basis.<br>▸ Green check mark: Corresponds to comparison basis.<br>The other columns contain the user names and the display of the respective authorization levels (on page 430). |
| **Close** | Closes the window. |

The size and position of the dialog can be changed. These settings are saved as user-dependent.

## 18.6 Access rights for Report Launcher

With the access rights for the Report Launcher user, a distinction is made between two types of rights:

1. User profile

   These define whether a user can access objects on the Report Launcher and the underlying SQL server reporting services and whether they can change the configuration of the Report

Launcher and the underlying SQL server reporting services. A distinction is made between users (object access only) and administrators (object access and configuration changes).

2. Access rights to objects

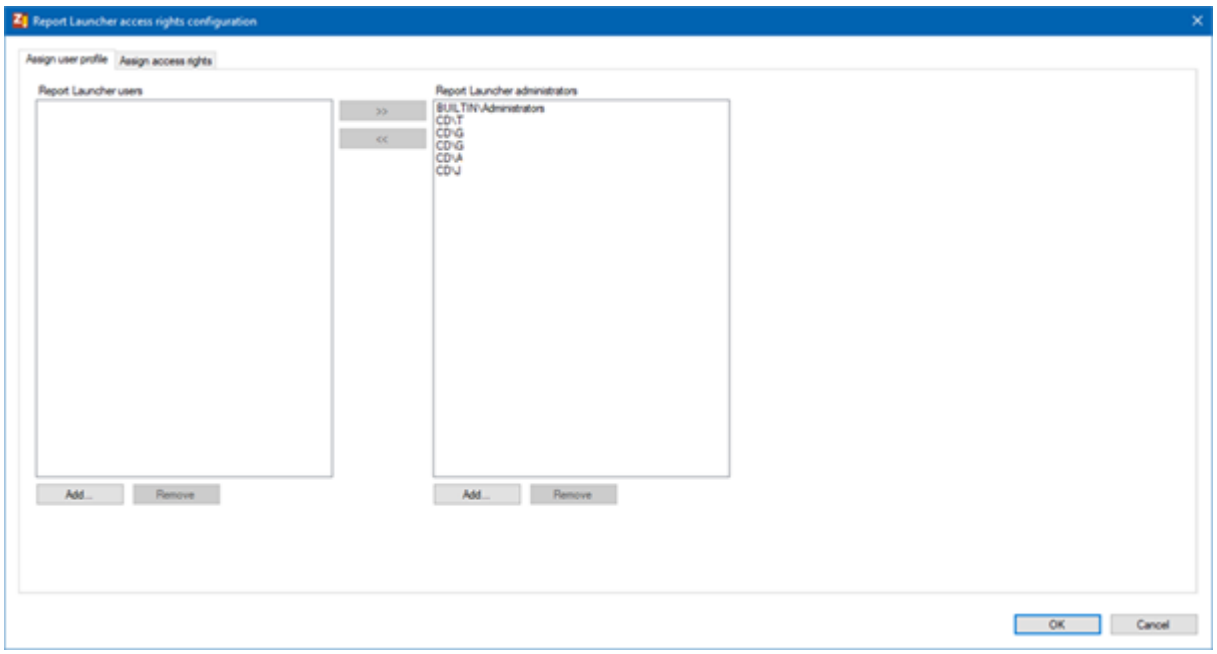
   These define which user can access which objects and with which rights.

   **Attention:** The object access rights are only then applicable if the accessing user has system access rights as a user or administrator.

To configure the access rights:

1. Open the **Analyzer Server** ribbon.
2. Select the **Report Launcher** entry in the **User administration** ribbon group.
3. The dialog to configure the access rights is opened.
   This dialog has two tabs to be configured
   - Assign user profile (on page 436)
   - Define access rights (on page 439)

## 18.6.1 Assign user profile

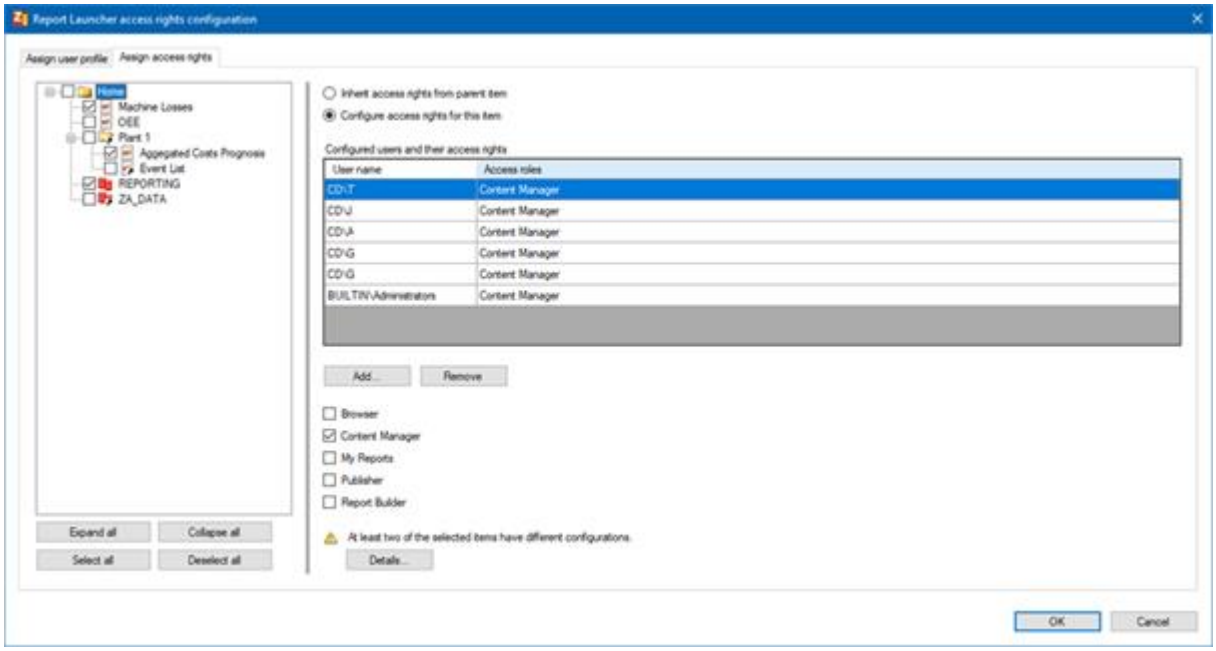



| Option | Description |
|---|---|
| **List of Report Launcher users** | Contains the currently-defined users of the SQL server reporting services on the Analyzer server.<br><br>Users can be added or removed using the **Add** and **Remove** button. The >> and << buttons are used to drag users to the |

| Option | Description |
|---|---|
| | list **Report Launcher administrators** or to add them from there.<br><br>Multiple selection is possible.<br><br>The rights of the currently logged-on user cannot be changed. |
| **Add** | Adding a user as an Report Launcher user.<br><br>Opens, depending on the **configuration of the user search** (on page 415), a dialog to select users:<br><br>▸ Direct query:<br>The **Search for users and user groups dialog** (on page 421) is opened. If a user is found, they are added. If a group is found, the group is added.<br><br>▸ Users and groups cached:<br>The **Select users and user groups** (on page 423) dialog is opened. Cached users and groups are offered for selection.<br><br>Users who are already entered as **Report Launcher administrators** cannot be added using this dialog. These can be dragged using the << button.<br><br>Users who have already been added are filtered out in the dialog. The dialog is only opened if at least one user can be added. |
| **Remove** | Deletes the selected users from the list without requesting confirmation. |
| **List of Report Launcher administrators** | Contains the currently-defined administrators of the SQL server reporting services on the Analyzer server.<br><br>Users can be added or removed using the **Add** and **Remove** button. The >> and << buttons are used to drag users to the list **Report Launcher administrators** or to add them from there.<br><br>Multiple selection is possible. |
| **Add** | Adding a user as an Report Launcher user.<br><br>Opens, depending on the **configuration of the user search** (on page 415), a dialog to select users:<br><br>▸ Direct query:<br>The **Search for users and user groups dialog** (on page |

| Option | Description |
|---|---|
| | 421) is opened. If a user is found, they are added. If a group is found, the group is added.<br>▶ Users and groups cached:<br>The **Select users and user groups** (on page 423) dialog is opened. Cached users and groups are offered for selection.<br>Users who are already entered as **Report Launcher user** cannot be added using this dialog. These can be dragged using the >> button.<br>Users who have already been added are filtered out in the dialog. The dialog is only opened if at least one user can be added. |
| **Remove** | Deletes the selected users from the list without requesting confirmation. |
| **Button >>** | Moves all highlighted users to the group of administrators. |
| **Button <<** | Moves all highlighted users to the group of users. |
| **OK** | Applies all changes in all tabs and closes the dialog. |
| **Cancel** | Discards all changes in all tabs and closes the dialog. |

## 18.6.2 Assign access rights




| Option | Description |
|---|---|
| **Object list** | Display of all objects in the Report Launcher in an expandable tree structure. Each object is assigned an icon in the tree structure, which reflects its data type. The following data types are displayed:<br>▸ Folder<br>▸ Data source<br>▸ Report or linked report<br>▸ Different type<br>There is also a symbol for each object, which shows that the object inherits its configuration.<br>**Editing:**<br>If an object is marked, it is unlocked for editing in the right part of the dialog.<br>Several projects can also be edited at the same time. To do this, they are selected by activating the check box in front of them. If several objects are selected for editing, the configuration of the object with the first path in alphabetical order (the furthest up in the tree) is displayed.<br>If objects with different configurations are selected together, a warning is shown. |

| Option | Description |
|---|---|
| **Expand all** | Clicking on this expands all nodes. |
| **Collapse all** | Clicking on this collapses all nodes. Only the root folder is displayed. |
| **Select all** | Activates the checkboxes of all visible elements. |
| **Clear selection** | Deactivates the checkboxes of all elements. |
| **Separator** | Left area (tree with objects) and right area (configuration) are divided by a separator. To change the ratio between the two, drag the separator with the mouse into the desired direction. |
| **Inherit access rights from parent item** | Configuration of the inheritance:<br>▸ *Active*: The selected elements take their properties from the superordinate object.<br>If the configuration is inherited, the user rights can be displayed, but not changed.<br>**Attention:** If **inherit access rights from superordinate object** is set for an object, the other configuration set before this is lost. The loss of the configuration can be prevented by closing the dialog. However all the changes that have been made before that are also lost. |
| **Configure access rights for this item** | Configuration of the access rights for an individual object.<br>▸ *Active*: The rights of the user are defined for the selected objects with the following configuration elements. Existing inheritances are lost in the process.<br>The properties for the **main directory** object, the uppermost object, must always be defined. |
| **Configured users and their access rights** | List of all users assigned to the selected objects and their access rights. Each user is displayed in their own line. Several users can be selected at the same time.<br>The following are displayed:<br>▸ User names<br>▸ Roles assigned to the user; several roles are displayed separately by means of a comma<br>**Role**<br>The roles of the users are stipulated using the checkboxes below the |

| Option | Description |
|---|---|
| | list. Each user can have several roles at the same time.<br><br>If several users are highlighted in the table, the configuration of the last-selected user is displayed. Each change then has an effect on all highlighted users.<br><br>If a user does not have a role for an object, they are considered deleted when setting the configuration for this object. There are the following roles:<br>▸ **Browser**<br>▸ **Content Manager**<br>▸ **My Reports**<br>▸ **Publisher**<br>▸ **Report Builder**<br><br>Only available if **Define access rights for this object** has been activated. |
| **Add** | Opens the dialog (on page 422) for adding users.<br><br>Only available if **Define access rights for this object** has been activated.Only users or user groups that have been configured in the **Assign user profile** (on page 436) tab can be selected. Users who have already been added are filtered out in the dialog. The dialog is only opened if at least one user can be added. |
| **Remove** | Deletes all selected users from the list.<br><br>Only available if **Define access rights for this object** has been activated. |
| **Browser** | *Active*: The role is assigned to selected users.<br><br>The user can see the folder and reports and subscribe to reports. |
| **Content Manager** | *Active*: The role is assigned to selected users.<br><br>The user can manage content on the report server. This includes folder, reports and sources. |
| **My Reports** | *Active*: The role is assigned to selected users.<br><br>The user can:<br>▸ Publish reports and linked reports<br>▸ Manage folders, reports and sources in a user's **My reports** |

| Option | Description |
|---|---|
| | folder |
| **Publisher** | *Active*: The role is assigned to selected users.<br>The user can publish reports and linked reports on the report server. |
| **Report Builder** | *Active*: The role is assigned to selected users.<br>The user can see report definitions and start the Report Builder. |
| **Warnings** | Only visible if errors are present. Consists of: Warning symbol, text with warning notice and button to display the details.<br>Condition for display of warnings:<br>▸ Two or more objects are highlighted in the tree structure, the configurations of which are different The warning notice is displayed. Clicking on the **Details** button opens a window with details (on page 443) on the warning.<br>▸ All objects highlighted in the tree structure have the same configuration, but two or more highlighted users have different configurations. The warning notice is displayed. Clicking on the **Details** button opens a window with details (on page 443) on the warning.<br>**Attention:** The display of a warning means that changes to the configuration and the confirmation of these also makes changes for objects with an original configuration that is different to the configuration displayed here. The original configuration for these objects is then lost. |
| OK | Applies all changes in all tabs and closes the dialog. |
| Cancel | Discards all changes in all tabs and closes the dialog. |

The size and position of the dialog can be changed. These settings are saved as user-dependent.

### Attention

In this tab, the rights of the user currently connected are not protected from changes. Erroneous configuration when assigning roles can thus lead to no users having sufficient administration rights on the report server.

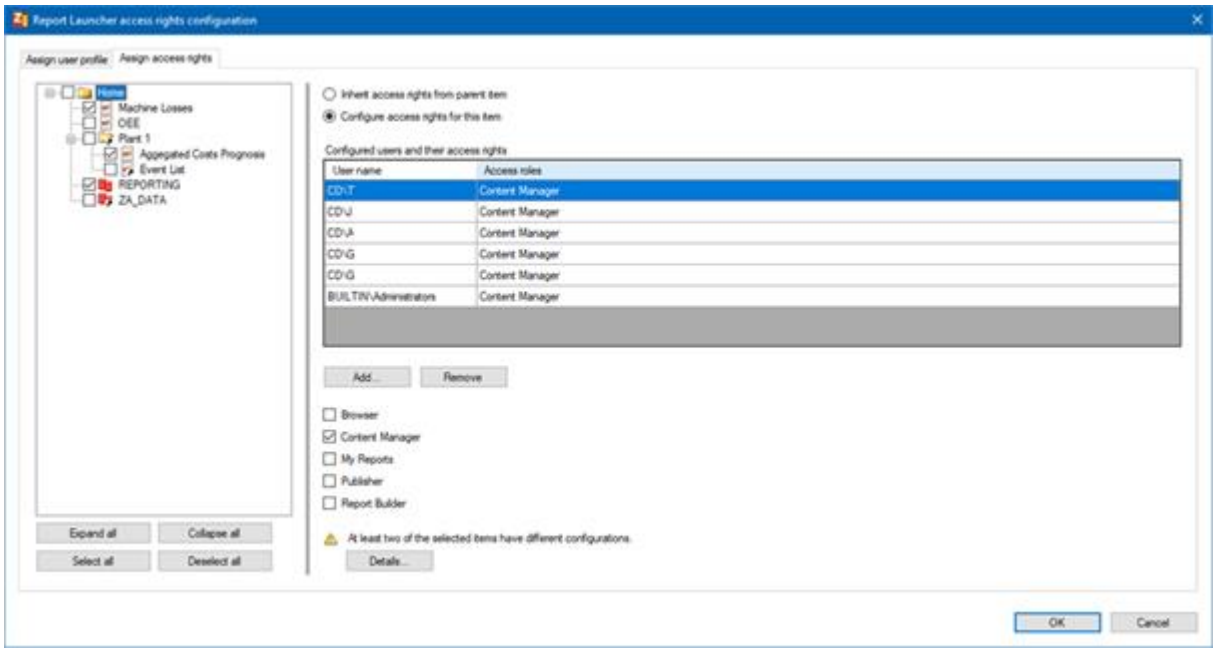
## 18.6.3 Warning details for different authorization levels

If configurations are selected that are in conflict and could lead to the loss of previously-established configurations, a warning is shown in the configuration dialog. Warnings are shown if:

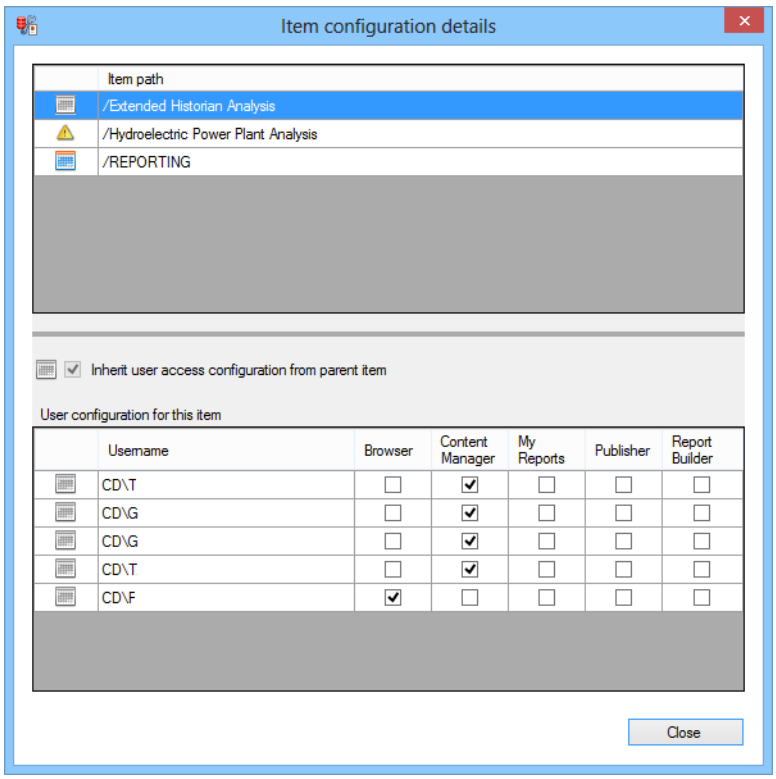
- Two or more objects were highlighted in the tree structure, the configurations of which are different
- Two or more highlighted users have different configurations

### THERE ARE DIFFERENT ACCESS RIGHTS TO OBJECTS ON THE REPORT SERVER

If several objects that have different settings are selected for configuration at the same time, a warning is displayed in the configuration dialog:



Clicking on the **Details** button opens a window with details on the warning. No inputs can be made in this dialog:



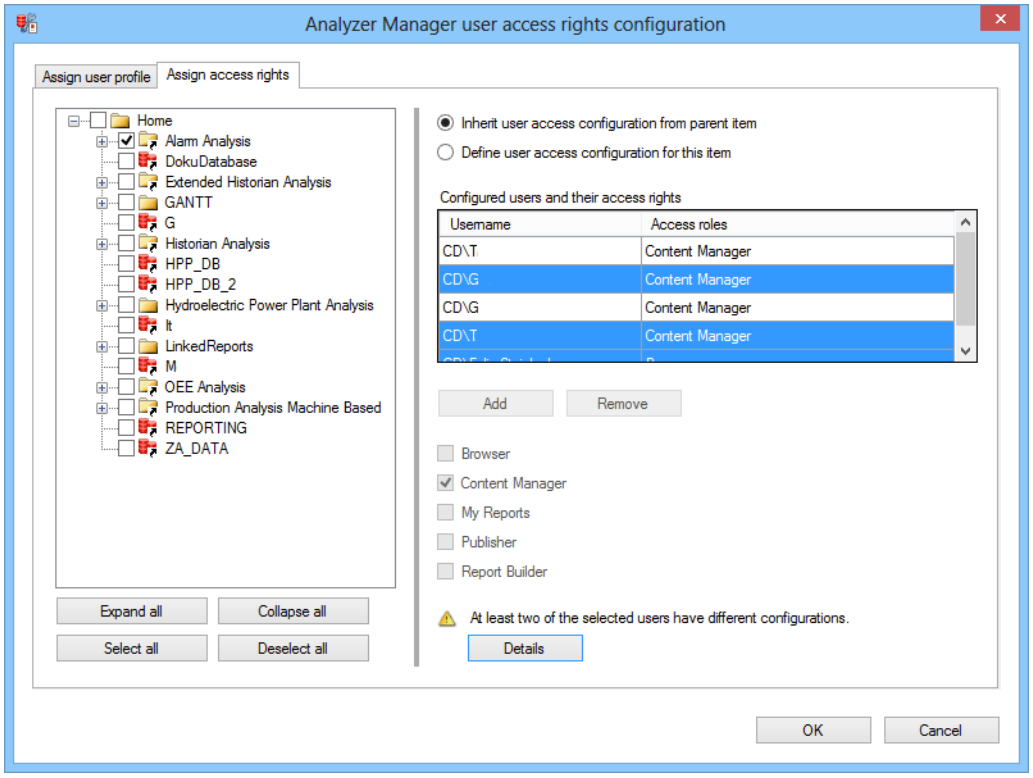

| Option | Description |
|---|---|
| **List of objects** | Display of all selected objects.<br>The first column shows the type of warning:<br>▸ Gray circle: Basis for comparison. The configuration of the object with the first path in alphabetical order (the furthest up in the tree) is selected as a basis.<br>▸ Green check mark: Corresponds to comparison basis.<br>▸ Yellow triangle: Differs from the comparison basis.<br>The second column shows the object path.<br>One line each can be selected in this list. The configuration details for the selected object are displayed in the lower area. |
| **Separator** | Upper area (objects) and lower area (user) are divided by a separator. To change the ratio between the two, drag the separator with the mouse into the desired direction. |
| **Inherit user access configuration from parent item** | The symbol shows whether the assignment of the configuration mode: |

| Option | Description |
|---|---|
| | ▸ Is a basis for comparison (hash symbol) : Basis for comparison. The configuration of the object with the first path in alphabetical order (the furthest up in the tree) is selected as a basis.<br>▸ Corresponds to comparison basis (blue circle)<br>▸ Differs from comparison basis (yellow triangle)<br>The checkbox shows the configuration mode:<br>▸ *active*: Object inherits configuration from superordinate object<br>▸ *Inactive*: Object is configured individually |
| **List of users and their roles** | Each row of this table constitutes a user and has one of the three following background colors:<br>▸ White: The user is defined in both the comparison basis and the object currently being looked at.<br>▸ Grey: The user is defined in the object currently being looked at, however they do not appear in the comparison basis.<br>▸ Red: The user is defined in the comparison basis, however does not appear in the object being looked at.<br>The table consists of the following columns:<br>▸ Symbol for the type of row. The symbols correspond to those in the **List of objects** area.<br>▸ User names<br>▸ Columns with the possible roles.<br>Activated checkbox: The user has this role. |
| **Close** | Closes the window. |

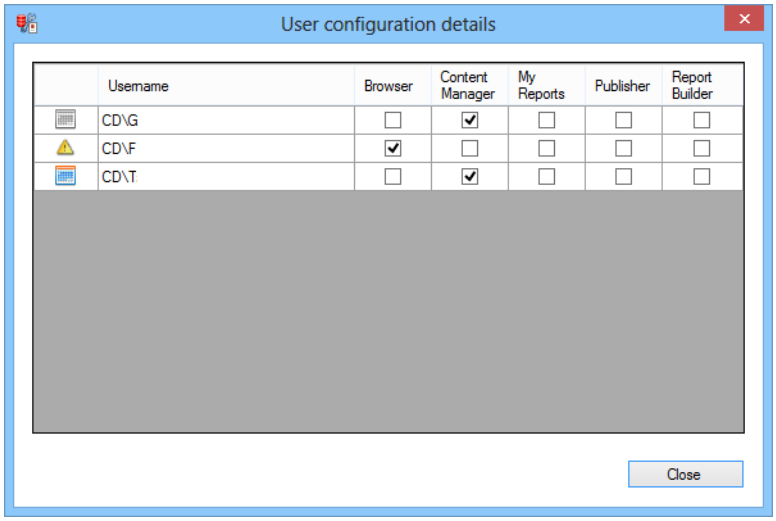
The size and position of the dialog can be changed. These settings are saved as user-dependent.

## ROLES FOR USERS

If users with different settings are selected for joint configuration, a warning notice is shown in the dialog to configure the access rights (on page 431):




Clicking on the **Details** button opens a window with details on the warning. No inputs can be made in this dialog:




| Option | Description |
|---|---|
| **User List** | Display of all configured users. |

| Option | Description |
|---|---|
| | The first column shows the type of warning:<br>▸ Hash: Basis for comparison. The configuration is selected on the basis of the last selected user.<br>▸ Blue circle: Corresponds to comparison basis.<br>▸ Yellow triangle: Differs from the comparison basis.<br>The other columns contain the user names and the display of the respective roles.<br>Activated checkbox: The user has this role. |
| **Close** | Closes the window. |

The size and position of the dialog can be changed. These settings are saved as user-dependent.

# 19 Metadata database editors

There are editors available to edit metadata in zenon Analyzer:

- Manual Data Editor (on page 495): Used for the editing of the tables for price and standard values in a zenon Analyzer metadata database.
- Metadata Editor (on page 447): Allows the editing of die labels and descriptions of various objects.

The applications can be can be started from ZAMS, from the Start menu and from Windows Explorer as independent programs.

# 20 Metadata Editor

The Metadata Editor makes it possible to:

- Enter equipment information
- Amend visual names and descriptions for equipment, event classes, event groups, users, projects, variables and archives
- To create and edit efficiency class models

The Metadata Editor is typically used between the export of metadata with the Analyzer Export Wizard and the start of report creation with ZAMS.

The Metadata Editor is a separate application. This can be started for editing directly from ZAMS, from the start menu item or directly via the file.

### Information

If visual names of objects are changed, it may be necessary to re-deploy or re-configure reports from ZAMS. It is generally sufficient to open the editing dialog once and to close it again.

## REQUIREMENTS

To be able to use the Metadata Editor with a database, the following requirements must be met:

- The database must be a version 2.0 or higher Analyzer database with a valid structure.
- The user must have the rights to edit the metadata.
  These rights can be configured in ZAMS.

## ZAMS

To open the Metadata Editor in ZAMS:

1. Navigate to the **Options** ribbon in ZAMS.
2. Select the **Metadata Editor** entry

   The **Metadata Editor** is started. The dialog toi establish a connection (on page 449) is opened at the same time.

**Start as stand-alone application:**

- In the Windows Start menu, select the **COPA-DATA -> Metadata Editor.** entry.
  The **Metadata Editor** is started.

### Information

Inputs in text fields are evaluated during configuration. Dialogs can be confirmed with **OK** if there are no validation errors.

In general, the following applies:

- The following are not permitted for display name, names, references identifications and meanings: Comma (,) and simple apostrophe (').
- The following is not permitted for descriptions, units and status text: Comma (,)

Errors are explained in pop-up messages.

### KEYBOARD SHORTCUTS

The following key combinations are available for use in the Editor:

| Key combination | Description |
|---|---|
| **F1** | Opens help |
| **Ctrl+Shift+C** | Opens the dialog for creating a database backup. |
| **Ctrl+S** | Saves changes. |
| **Alt+F4** | Closes the CD_PRODUCTNAME Editor |
| **Ctrl+Z** | Undo input |
| **Ctrl+Y** | Repeat input. |

## 20.1 Connect

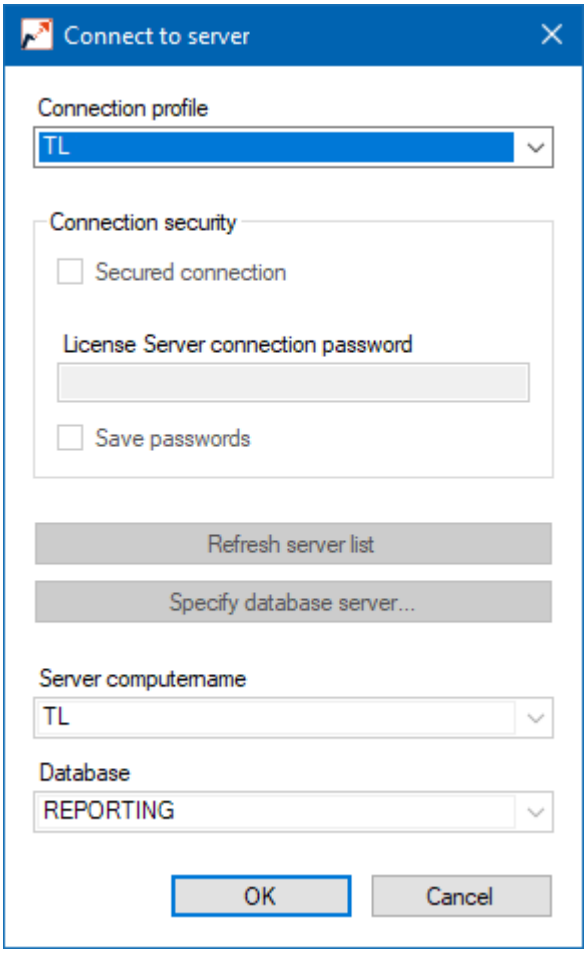
The Metadata Data Editor administers its own connection profile. The ZAMS connection profiles are also read on startup. If there are profiles in the Metadata Editor and in ZAMS with the same name, this dominates the connection profile of the Manual Data Editor.

To link the Manual Data Editor to a database:

1. Start the **Metadata Editor** as a Stand alone Tool from the start menu or using the **EXE** file from the options in ZAMS.
   If the **Metadata Editor** has already been opened, select the **Establish connection** command in the **File** menu.

   The dialog to connect to a server is opened.

2. Select the desired connection by clicking on **Connection profile** or create a new connection (on page 75) in a similar manner to that of ZAMS.




Note: In this connection dialog, no change password is required for secure communication.

3. Click on **OK**.

   a) The connection is created.

   b) The user authorization is queried by the license server

   c) The database is checked to see that it is correct.
   **Note:** No connection is established if there are incorrect structures or versions.
   Conversion (on page 182) is only possible with ZAMS.

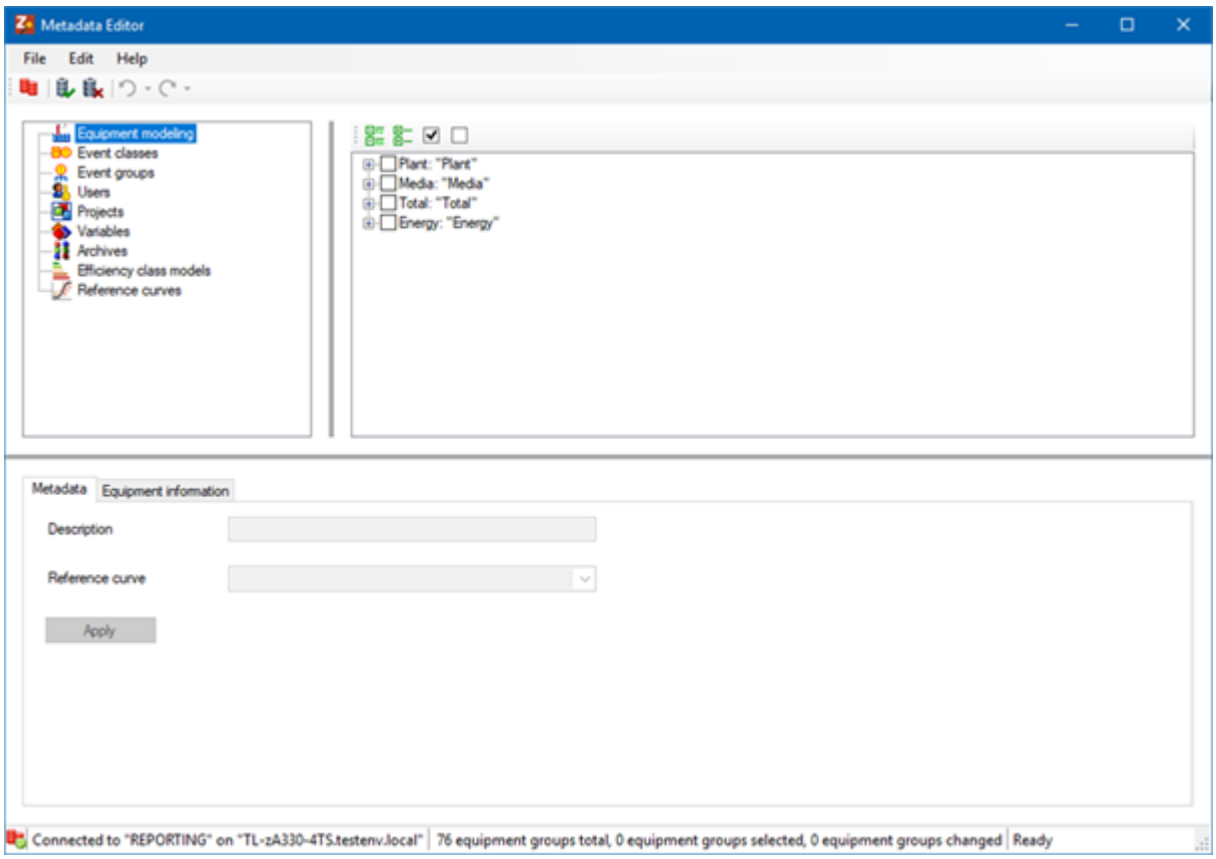
   d) Data is loaded

   e) The license is obtained.
   Errors when obtaining the license are shown in a pop-up.

   f) The loaded data is displayed in the Manual Data Editor.

**Note:** Unsaved changes are lost without warning when the connection is established.

## 20.2 Main window




| Range | Description |
|---|---|
| **Menu bar** | Menus (on page 491) to edit and save the objects. |
| **Tool Bar** | Symbols (on page 491) to edit and save the objects. |
| **Object type window** | Selection of the object type to be edited. The following are available:<br>▸ **Equipment modeling**: (on page 454)<br>Clicking this shows the configured equipment models in the **object selection window**.<br>▸ **Event classes** (on page 460):<br>Clicking this shows event classes in a filtered list with a project reference in the **Object selection window**.<br>▸ **Event groups** (on page 462):<br>Clicking this shows event groups in a filtered list without reference to a project in the **object selection window**.<br>▸ **User** (on page 464):<br>Clicking this shows users in a filtered list without |

| Range | Description |
|---|---|
| | reference to a project in the **object selection window**.<br>▸ **Projects** (on page 466):<br>Clicking this shows projects in a filtered list without reference to a project in the **object selection window**.<br>▸ **Variables** (on page 470):<br>Clicking this shows variables in a filtered list without reference to a project in the **object selection window**.<br>▸ **Archives** (on page 472):<br>Clicking this shows archives in a filtered list without reference to a project in the **object selection window**.<br>▸ **Efficiency class models** (on page 475):<br>Clicking shows configured efficiency class models in the **Window object selection**. These are created and edited in the editing area.<br>▸ **Reference curves** (on page 484):<br>Selection of reference curves. |
| **Object selection window** | Selection of the objects according to the type of list by marking of checkboxes and marking the respective line. |
| **Editing area** | Entry and acceptance of changes. |
| **Status bar** | Display of status information (on page 491) on connection and actions. |

## 20.3 Actions

Visual names and descriptions can be amended in the Metadata Editor and equipment information can be entered. Changes can be made to the following object types:

- Equipment Modeling (on page 454)
- Event classes (on page 460)
- Event groups (on page 462)
- Users (on page 464)
- Projects (on page 466)
- Variables (on page 470)
- Archives (on page 472)

- Efficiency class models (on page 475)
- Reference curves (on page 484)

## SAVE CHANGES

Changes are transferred to the database by means of the command or the **Save changes** symbol and saved there. The transfer of changes is checked and confirmed once this has been carried out (**Commit**). If a change to a variable is not successful, the transaction is reversed (**Rollback**).

### Attention

If an error occurs when completing one of the transactions (**Rollback** or **Commit**), the database can become corrupted and thus unusable.

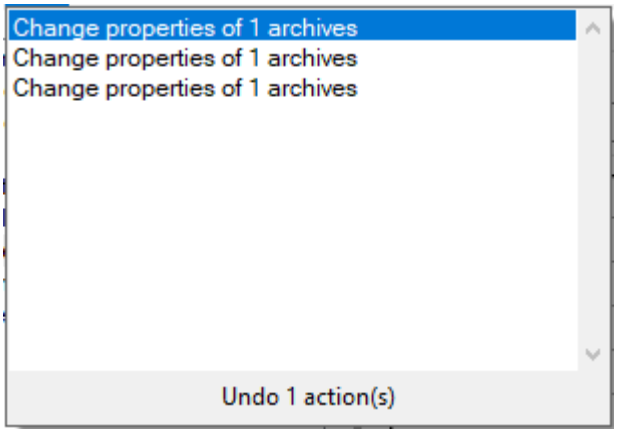
## UNDO - RESTORE

Actions in the Manual Data Editor can be undone or restored.

### UNDO

To undo actions:

1. Select the **Undo** command in the toolbar.
2. Clicking directly on the symbol undoes the last action.
3. Clicking on the button opens a window with the available actions:



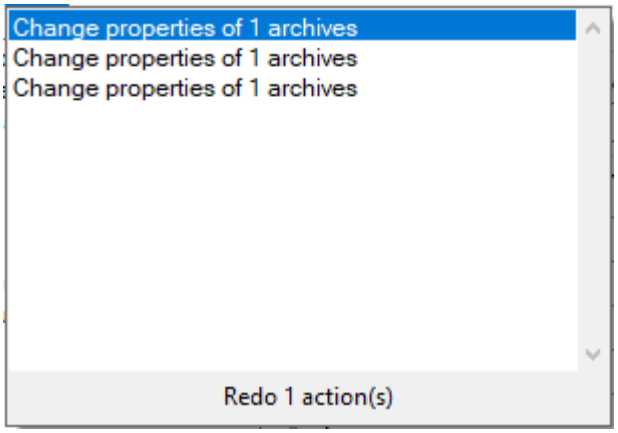

4. Highlight the desired actions.

   Several interrelated actions from the top (last to be have been carried out) to the bottom.
5. The status line shows how many actions are being undone.
6. Clicking on the selected action undoes it.

### RESTORE

To restore actions:

1. Select the **Restore** command in the toolbar.
2. Clicking on the symbol directly restores the last action that has been undone.
3. Clicking on the button opens a window with the available actions that were undone:




4. Highlight the desired actions.

   Several interrelated actions from the top (last to be have been undone) to the bottom can be selected.
5. The status line shows how many actions have been restored.
6. Clicking on the selected action restores it.

## 20.3.1Equipment Modeling

Metadata and equipment information can be changed for equipment models. Two tabs are available for the configuration:

- Meta data (on page 455)
- Equipment information (on page 457)

### EQUIPMENT MODELING TOOLBAR AND CONTEXT MENU

Nodes can be expanded or collapsed and checkboxes can be activated or deactivated using the toolbar and a context menu. The functionality of toolbars and the context menu has a different effect:

- Symbols: Have an effect on all entries in the complete tree. Only the visible elements are taken into account during selection/deselection.
- Commands in the context menu: Has an effect on the selected nodes and all its subnodes, regardless of their visibility.

### TOOLBAR

The symbols´ meaning from left to right:

| Symbol | Description |
|---|---|
| **Expand all nodes** | Clicking expands all nodes of an equipment model. |
| **Collapse all nodes** | Clicking collapses all nodes of an equipment model. Only root folders are displayed. |
| **Select all visible nodes** | Clicking activates all checkboxes of all displayed equipment models and equipment groups. Collapsed branches are not activated. |
| **Deselect all entries** | Clicking deactivates all checkboxes of all equipment models and equipment groups. |

### CONTEXT MENU

Right clicking on an equipment model or an equipment group opens a context menu:

| Command | Description |
|---|---|
| **Expand node and all child nodes** | Expands this node and all subordinate elements. |
| **Collapse node and all child nodes** | Clicking closes this node and all subordinate elements. |
| **Select node and all visible child nodes** | Activates the checkboxes for the selected entry and all subordinate entries. |
| **Deselect entry and all subordinate entries** | Deactivates the checkboxes for the selected entry and all subordinate entries. |

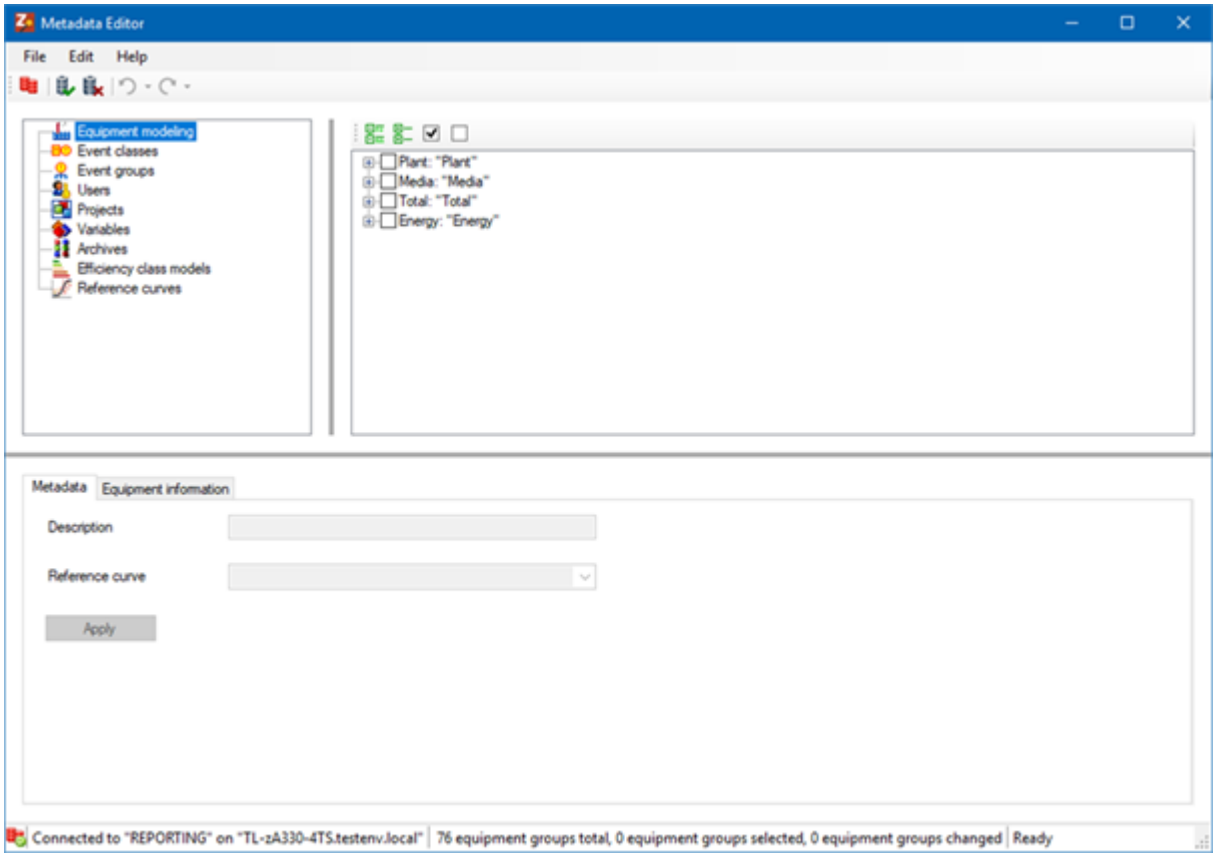
## 20.3.1.1 Metadata

To edit the metadata:

1. In the **Object type window**, select the **Equipment modeling** area.
2. In the **Object selection window**, select the desired object from the tree of the equipment groups.

   **Note:** You can also change the description for several objects at the same time.
3. Enter the desired changes in the **editing area**.

4. Click on the button **Apply**.
5. Click on the **Save changes** symbol to write the changes to the database.




| Option | Description |
|---|---|
| **Object type window** | Selection of the object type, for which objects are to be changed. |
| **Object selection window** | Selection of the equipment groups to be changed.<br>The objects:<br>▸ Are selected using checkboxes<br>▸ Cannot be filtered<br>▸ Receive an asterisk (*) as a suffix if a text has been changed |
| **Editing area** | Entry and acceptance of changes. |
| **Visual name** | Display only.<br>Changes are not possible. |
| **Description** | Entry to change the description of equipment groups. |

| Option | Description |
|---|---|
| | **Note:** If several objects with different descriptions are selected for change, the original description of the first element in the list is displayed in red. Changes have an effect on all highlighted objects. |
| **Reference curve** | Selection of a reference curve from drop-down list.<br>The selection only has an effect on all selected equipment groups. The *No reference group* entry can also be selected. All linkings to reference curves are thus released.<br>If different reference curves have been configured for the selected equipment groups, the drop-down list is shown with a red border. |
| **Apply** | Clicking on the button accepts the changes. These are only written by clicking on the command or the **Save changes** symbol in the database.<br>Only available if a change has been made and no rules have been broken. |

### 20.3.1.2 Equipment information

To amend equipment information:

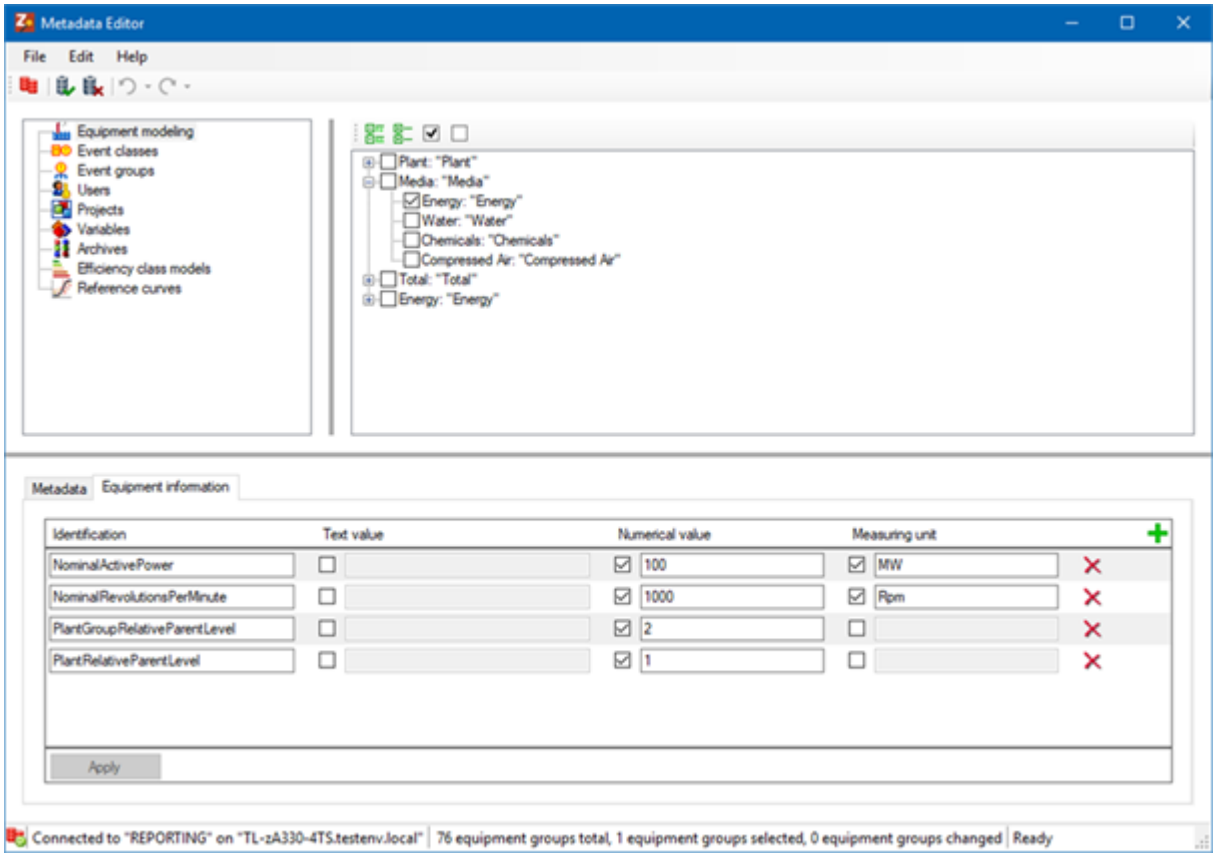
1. In the **Object type window**, select the **Equipment modeling** area.
2. In the **Object selection window**, select the desired object from the tree of the equipment groups.

   **Note:** You can also change equipment information for several objects at the same time.
3. If equipment information is already present, these are displayed in the **editing area**.
4. If you want to create equipment information from scratch, click on the **New** button.
5. Enter the desired information in the **editing area**.

   In doing so, please note:

   - The identification must not be empty.
   - Each entry within an equipment group must have a unique identification.
6. Add further lines if required.
7. Delete lines that are not needed by clicking on the **X** button.

8. Click on the button **Apply**.
9. Click on the **Save changes** symbol to write the changes to the database.




| Option | Description |
|---|---|
| **Object type window** | Selection of the object type, for which objects are to be changed. |
| **Object selection window** | Selection of the equipment groups to be changed.<br>The objects:<br>▸ Are selected using checkboxes<br>▸ Cannot be filtered<br>▸ Receive an asterisk (*) as a suffix if a text has been changed |
| **Editing area** | Each line in the editing area corresponds to an entry in the **EQUIPMENTINFO** table, which is assigned to the currently-selected equipment group. Several equipment groups can also be selected.<br>If several equipment groups with different entries are selected, then a warning is shown at the lower border of the **editing area**. The entries of the equipment group are then displayed with the |

| Option | Description |
|---|---|
| | lowest ID that has fewer than 0 entries. |
| **Symbol: New** | Clicking on the button adds a new line.<br>A line consists of the following elements:<br>▸ Identification (mandatory)<br>▸ Text value (optional)<br>▸ Numeric value (optional)<br>▸ Measuring unit (optional) |
| **Identification** | Input of the identification for the entry. In doing so, the following rules apply:<br>▸ Identification must not be empty.<br>▸ Each entry within an equipment group must have a unique identification. |
| **Text value** | Input of a text value for the entry.<br>Can be activated/deactivated by means of a checkbox. |
| **Numeric value** | Input of a numeric value for the entry. In doing so, the following rules apply:<br>▸ If this option value is activated, there must be a valid floating point number.<br>Can be activated/deactivated by means of a checkbox. |
| **Measuring unit** | Input of a measuring unit for the entry.<br>Can be activated/deactivated by means of a checkbox. |
| **X** | Clicking on the symbol deletes the line from the list. |
| **Apply** | Clicking on the button accepts the changes. These are only written by clicking on the command or the **Save changes** symbol in the database.<br>Only available if a change has been made and no rules have been broken. A violation of the rules is displayed by the background color of the input field changing and a tooltip being displayed. |

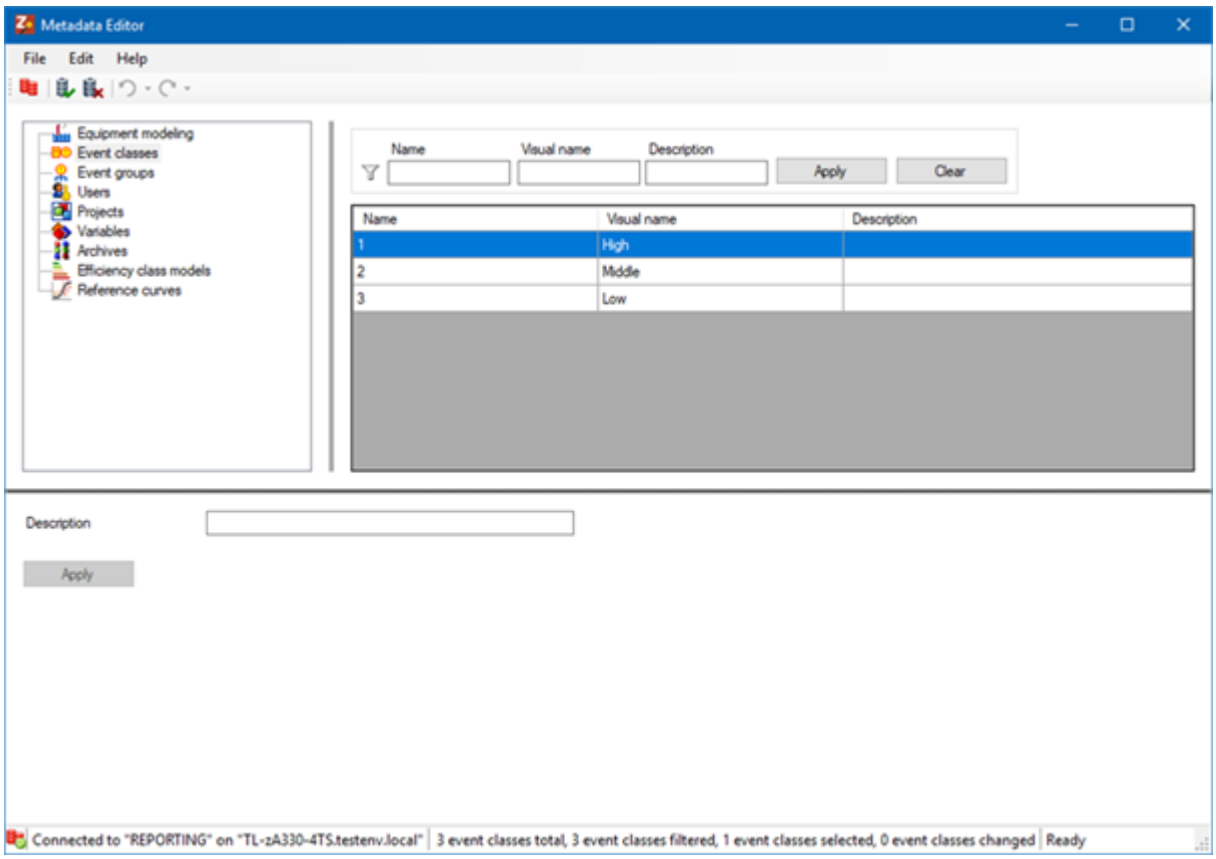
## 20.3.2 Event classes

To make changes for event classes:

1. In the **Object type window**, select the **Event classes** area.
2. If necessary, filter the list in the **Window Object Selection.**

   Highlight the desired entry.

   **Note:** You can also change the description for several objects at the same time.
3. Enter the desired changes in the **editing area**.
4. Click on the button **Apply**.
5. Click on the **Save changes** symbol to write the changes to the database.




| Option | Description |
|---|---|
| **Object type window** | Selection of the object type, for which objects are to be changed. |
| **Object selection window** | Selection of the event classes to be changed.<br>The objects:<br>▸ Can be filtered |

| Option | Description |
|---|---|
| | ▸ Are selected by clicking on the line (multiple selection is possible)<br>▸ Are highlighted in red if they have been changed (the highlighting is also retained if the change is undone.)<br>Each line is an entry. |
| **Filter** | Entry of filter criteria for the list of the event classes.<br>It is possible to filter according to:<br>▸ **Name**<br>▸ **Visual name**<br>▸ **Description**<br>Wildcards can be used:<br>▸ *****: any desired number of any desired characters<br>▸ **?**: precisely 1 desired character.<br>If a filter text does not contain a wild card, a ***** is automatically added. |
| **Apply** | Applies filter to list. |
| **Delete** | Resets filter |
| **Editing area** | Entry and acceptance of changes. |
| **Visual name** | Display only.<br>Changes are not possible. |
| **Description** | Entry to change the description of event classes.<br>**Note:** If several objects with different descriptions are selected for change, the original description of the last element selected is displayed in red. Changes have an effect on all highlighted objects. |
| **Apply** | Clicking on the button accepts the changes. These are only written by clicking on the command or the **Save changes** symbol in the database.<br>Only available if a change has been made and no rules have been broken. |

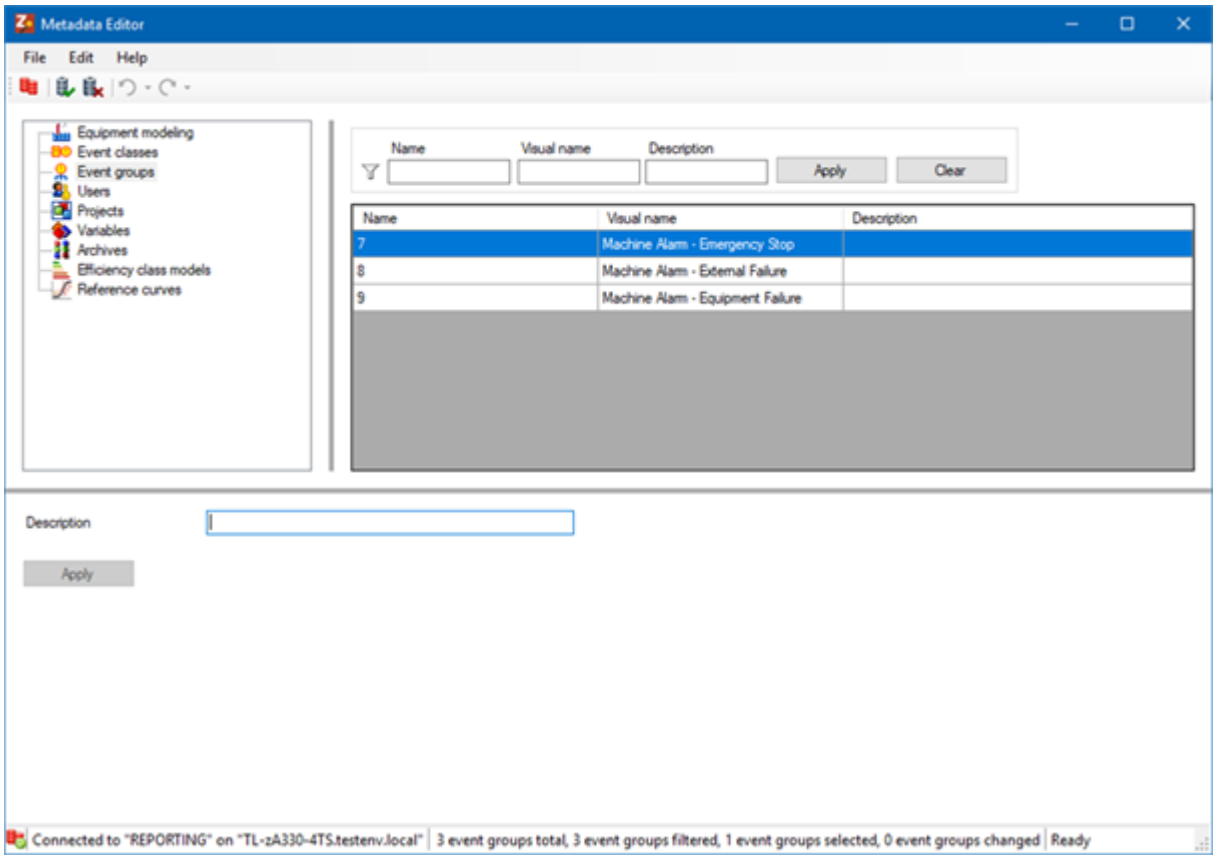
## 20.3.3 Event groups

To make changes for event groups:

1. In the **Object type window**, select the **Event groups** area.
2. If necessary, filter the list in the **Window Object Selection.**

   Highlight the desired entry.

   **Note:** You can also change the description for several objects at the same time.
3. Enter the desired changes in the **editing area**.
4. Click on the button **Apply**.
5. Click on the **Save changes** symbol to write the changes to the database.




| Option | Description |
|---|---|
| **Object type window** | Selection of the object type, for which objects are to be changed. |
| **Object selection window** | Selection of the event groups to be changed. |

| Option | Description |
|---|---|
| | The objects:<br>▸ Can be filtered<br>▸ Are selected by clicking on the line (multiple selection is possible)<br>▸ Are highlighted in red if they have been changed (the highlighting is also retained if the change is undone.)<br>Each line is an entry. |
| **Filter** | Entry of filter criteria for the list of the event classes.<br>It is possible to filter according to:<br>▸ **Name**<br>▸ **Visual name**<br>▸ **Description**<br>Wildcards can be used:<br>▸ *****: any desired number of any desired characters<br>▸ **?**: precisely 1 desired character.<br>If a filter text does not contain a wild card, a ***** is automatically added. |
| **Apply** | Applies filter to list. |
| **Delete** | Resets filter |
| **Editing area** | Entry and acceptance of changes. |
| **Visual name** | Display only.<br>Changes are not possible. |
| **Description** | Entry to change the description of event groups.<br>**Note:** If several objects with different descriptions are selected for change, the original description of the last element selected is displayed in red. Changes have an effect on all highlighted objects. |
| **Apply** | Clicking on the button accepts the changes. These are only written by clicking on the command or the **Save changes** symbol in the database. |

| Option | Description |
|---|---|
| | Only available if a change has been made and no rules have been broken. |

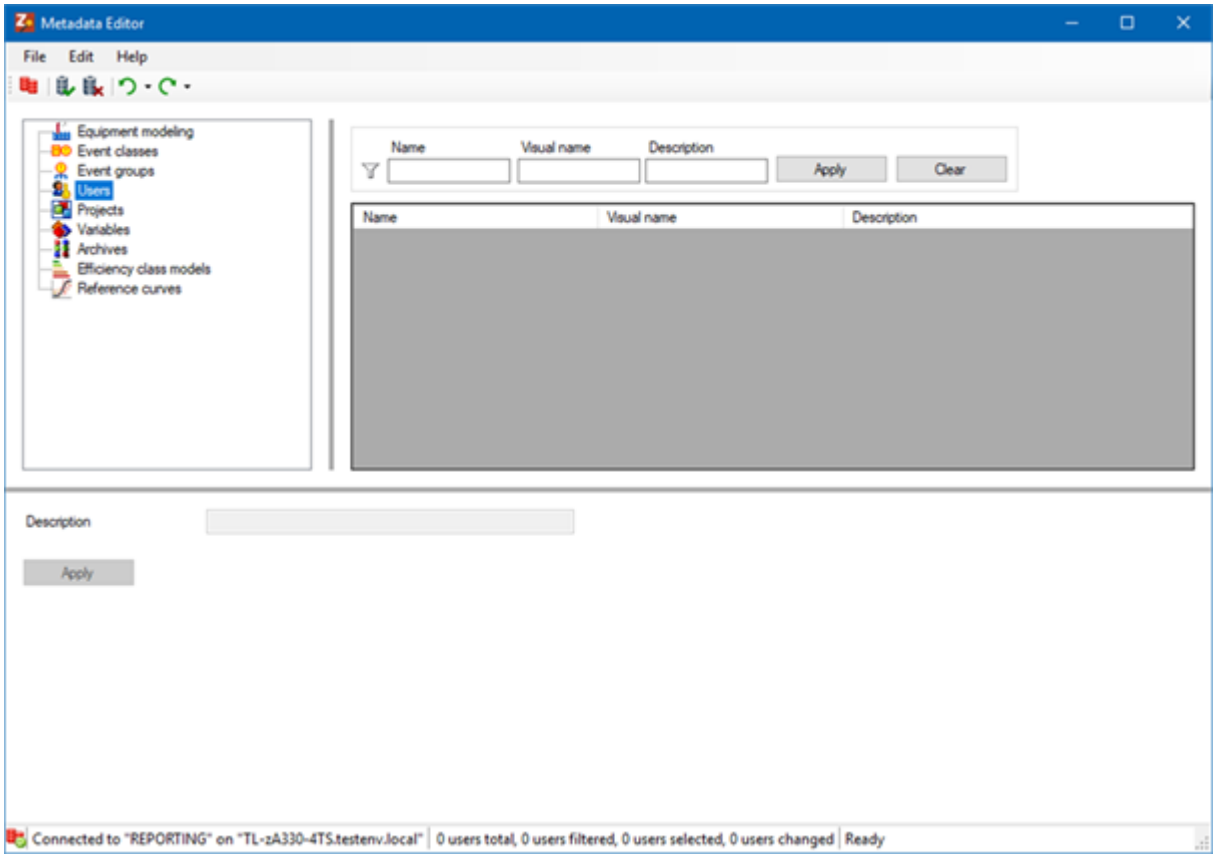
## 20.3.4 Users

To make changes for users:

1. In the **Object type window**, select the **User** area.
2. If necessary, filter the list in the **Window Object Selection.**

   Highlight the desired entry.

   **Note:** You can also change the description for several objects at the same time.
3. Enter the desired changes in the **editing area**.
4. Click on the button **Apply**.
5. Click on the **Save changes** symbol to write the changes to the database.



| Option | Description |
|---|---|
| **Object type window** | Selection of the object type, for which objects are to be changed. |
| **Object selection window** | Selection of the users to be changed.<br>The objects:<br>▸ Can be filtered<br>▸ Are selected by clicking on the line (multiple selection is possible)<br>▸ Are highlighted in red if they have been changed (the highlighting is also retained if the change is undone.)<br>Each line is an entry. |
| **Filter** | Entry of filter criteria for the list of users.<br>It is possible to filter according to:<br>▸ **Name**<br>▸ **Visual name**<br>▸ **Description**<br>Wildcards can be used:<br>▸ *****: any desired number of any desired characters<br>▸ **?**: precisely 1 desired character.<br>If a filter text does not contain a wild card, a ***** is automatically added. |
| **Apply** | Applies filter to list. |
| **Delete** | Resets filter |
| **Editing area** | Entry and acceptance of changes. |
| **Visual name** | Display only.<br>Changes are not possible. |
| **Description** | Entry to change the description of users.<br>**Note:** If several objects with different descriptions are selected for change, the original description of the last element selected is displayed in red. Changes have an effect on all highlighted objects. |

| Option | Description |
|---|---|
| **Apply** | Clicking on the button accepts the changes. These are only written by clicking on the command or the **Save changes** symbol in the database.<br><br>Only available if a change has been made and no rules have been broken. |

## 20.3.5 Projects

You can administer existing zenon projects in this tab, as well as add and administer new projects.

### INSERT PROJECT

To use zenon Analyzer with third-party databases, you may need a separate project. You can create and administer this in the Metadata Editor.

**Attention:** Self-created projects can no longer be deleted from the database.

**To add a project:**

1. In the **object selection window**, click on the button to add (a green plus sign).

   A new line is added to the list of projects.

   The identification is prescribed by the Metadata Editor and cannot be changed.
2. Amend the **display name** and/or **description**.
3. Click on the button **Apply**.

   The project is entered into the database.

### ADMINISTERING PROJECTS

The **display name** and **description** of all projects can be changed.

**To administer projects:**

1. In the **Object type window**, select the **Projects** area.
2. If necessary, filter the list in the **Window Object Selection.**

   Highlight the desired entry.

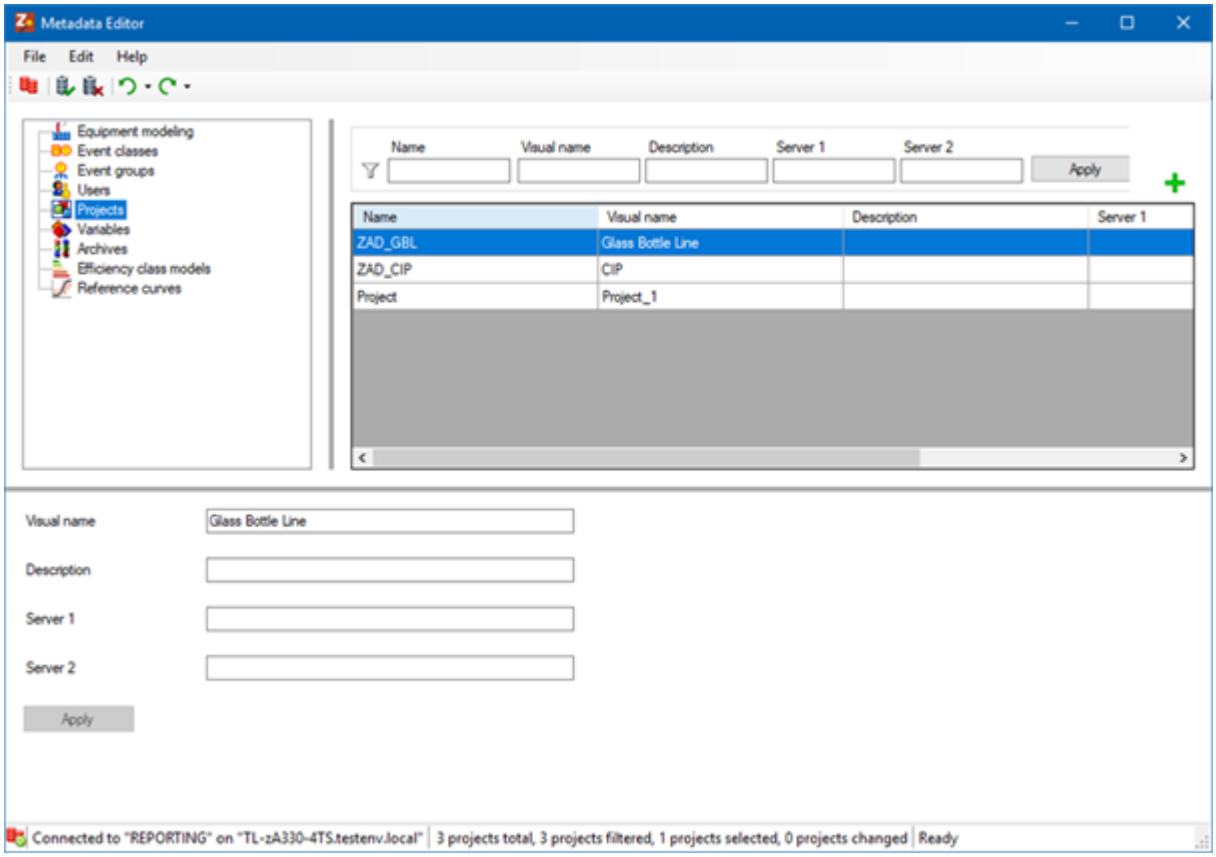
   **Note:** You can also change the description for several objects at the same time.
3. In the **editing area**, enter the desired changes for the **visual name** or the **description**.

4. Click on the button **Apply**.

   All changes are highlighted in red.

5. Click on the **Save changes** symbol to write the changes to the database.

## PROJECTS DIALOG




| Option | Description |
|---|---|
| **Object type window** | Selection of the object type, for which objects are to be changed. |
| **Object selection window** | Selection of the projects to be changed.<br>The objects:<br>▸ Can be filtered<br>▸ Are selected by clicking on the line (multiple selection is possible)<br>▸ Are highlighted in red if they have been changed (the highlighting is also retained if the change is undone.) |

| Option | Description |
|---|---|
| | Each line is an entry. |
| **Filter** | Entry of filter criteria for the list of projects.<br>It is possible to filter according to:<br>▸ **Name**<br>▸ **Visual name**<br>▸ **Description**<br>▸ **Server 1**<br>▸ **Server 2**<br>Wildcards can be used:<br>▸ *****: any desired number of any desired characters<br>▸ **?**: precisely 1 desired character.<br>If a filter text does not contain a wild card, a ***** is automatically added. |
| **Apply** | Applies filter to list. |
| **Delete** | Resets filter |
| **Add**<br>(plus sign) | Creates a new project in the list of projects. The identification is prescribed and fixed. The new project can no longer be deleted after saving. |
| **Editing area** | Entry and acceptance of changes. |
| **Visual name** | Entry to change the visual name of a project.<br>Only available if precisely 1 element has been selected. The following rules apply to the visual names:<br>▸ must not be empty<br>▸ Must be unique to the whole database |
| **Description** | Entry to change the description of projects.<br>**Note:** If several objects with different descriptions are selected for change, the original description of the last element selected is displayed in red. Changes have an effect on all highlighted objects. |
| **Server 1** | Entry for the **Server 1** project property in zenon Editor. |

| Option | Description |
|---|---|
| | Value is set by the **Metadata Synchronizer** if the **Network** property is active in the Editor project and this option is empty. If a server has already been entered, it is amended for **Metadata Synchronizer** network projects. The entry is left for standalone projects.<br><br>Entry for server can be changed manually. |
| **Server 2** | Entry for the **Server 2** project property in zenon Editor.<br><br>Value is set by the **Metadata Synchronizer** if the **Network** property is active in the Editor project and this option is empty. If a server has already been entered, it is amended for **Metadata Synchronizer** network projects. The entry is left for standalone projects.<br><br>Entry for server can be changed manually. |
| **Apply** | Clicking on the button accepts the changes. These are only written by clicking on the command or the **Save changes** symbol in the database.<br><br>Only available if a change has been made and no rules have been broken. |

## USE OF SERVER 1 AND SERVER 2

If the **Network** property is active in zenon, the **Metadata Synchronizer** gets the values for the **Server 1** and **Server 2** properties. These values are set in the Metadata Editor. If there are already entries present, they are left and not overwritten.

Possible applications:

- Network projects: The servers are automatically applied via the **Metadata Synchronizer**.
- Standalone projects: The server name can be stipulated in the Metadata Editor.
  This is necessary if the Runtime is not running on the Analyzer server. This setting is retained from the Editor in the event of another metadata synchronization.
  This setting is retained in the event of another synchronization with the **Metadata Synchronizer**.
- zenon Analyzer should not get data from the Runtime server but from a Runtime client:
  For network projects, the server names can be amended in the Metadata Editor. The Analyzer server then does not connect to the Runtime server but to the computer stipulated. The Runtime connector must be installed on this.

**Attention:** This setting is overwritten in the event of another synchronization of the **Metadata Synchronizer** and the server names from the Editor.

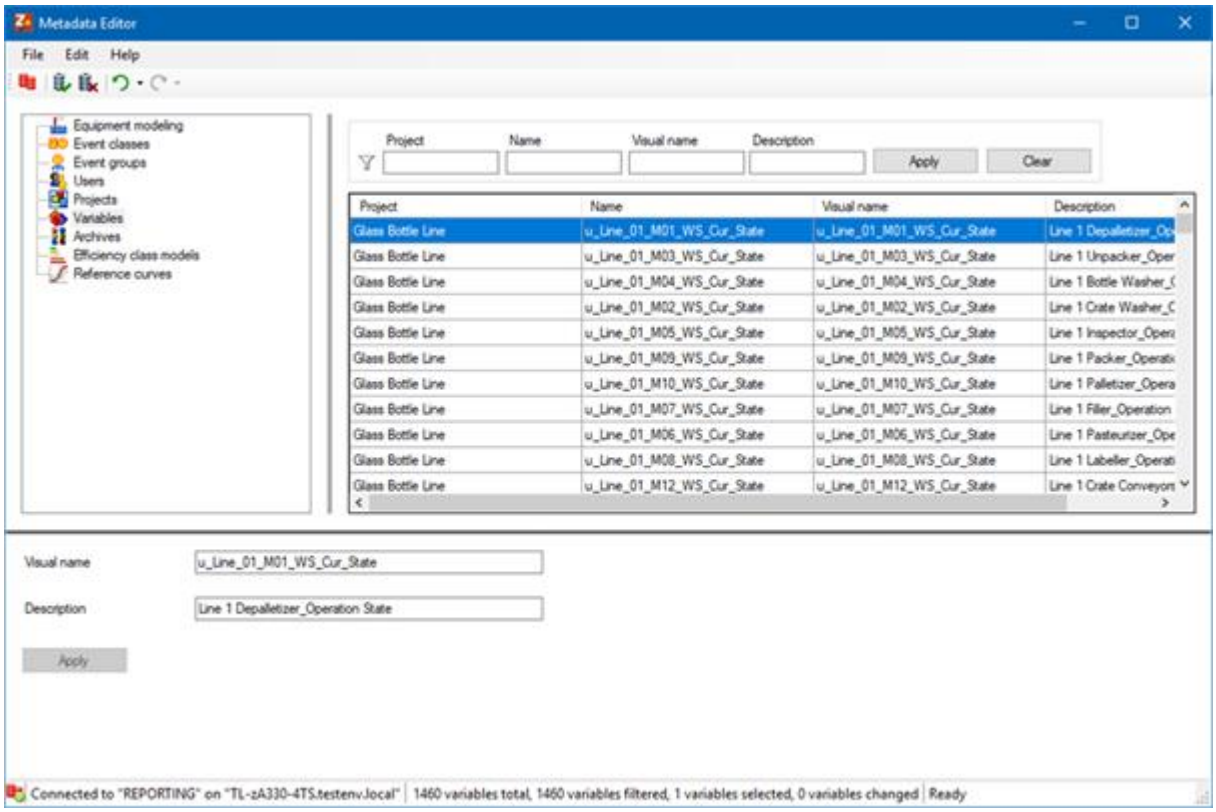
## 20.3.6 Variables

To make changes for variables:

1. In the **Object type window**, select the **Variables** area.
2. If necessary, filter the list in the **Window Object Selection.**

   Highlight the desired entry.

   **Note:** You can also change the description for several objects at the same time.
3. In the **editing area**, enter the desired changes for the **visual name** or the **description**.
4. Click on the button **Apply**.
5. Click on the **Save changes** symbol to write the changes to the database.




| Option | Description |
|---|---|
| **Object type window** | Selection of the object type, for which objects are to be changed. |
| **Object selection window** | Selection of the variables to be changed. |

| Option | Description |
|---|---|
| | The objects:<br>▸ Can be filtered<br>▸ Are selected by clicking on the line (multiple selection is possible)<br>▸ Are highlighted in red if they have been changed (the highlighting is also retained if the change is undone.)<br>▸ Each line is an entry. |
| **Filter** | Entry of filter criteria for the list of variables.<br>It is possible to filter according to:<br>▸ **Project**<br>▸ **Name**<br>▸ **Visual name**<br>▸ **Description**<br>Wildcards can be used:<br>▸ *****: any desired number of any desired characters<br>▸ **?**: precisely 1 desired character.<br>If a filter text does not contain a wild card, a ***** is automatically added. |
| **Apply** | Applies filter to list. |
| **Delete** | Resets filter |
| **Editing area** | Entry and acceptance of changes. |
| **Visual name** | Entry to change the visual name of a variable.<br>Only available if precisely 1 element has been selected. The following rules apply to the visual names:<br>▸ must not be empty<br>▸ Must be unique within a project |
| **Description** | Entry to change the description of variables.<br>**Note:** If several objects with different descriptions are selected for change, the original description of the last element selected |

| Option | Description |
|---|---|
| | is displayed in red. Changes have an effect on all highlighted objects. |
| **Apply** | Clicking on the button accepts the changes. These are only written by clicking on the command or the **Save changes** symbol in the database.<br><br>Only available if a change has been made and no rules have been broken. |

### VISUAL NAME SYNCHRONIZATION

Behavior when synchronizing the Metadata Editor and the **Metadata Synchronizer**:

1. A variable does not exist in the Metadata database:
   - **Visual name** in the zenon Editor is empty: The variable name is entered as the **Visual name** in the Metadata database.
   - **Visual name** in the zenon Editor is configured: The **Visual name** in the zenon Editor is entered as the **Visual name** in the Metadata database.
2. A variable already exists in the Metadata database and the visual name corresponds with the variable name:
   - **Visual name** in the zenon Editor is empty: The variable name is entered as the **Visual name** in the Metadata database.
   - **Visual name** in the zenon Editor is configured: The **Visual name** in the zenon Editor is entered as the **Visual name** in the Metadata database.
3. A variable already exists in the Metadata database and the visual name does not correspond with the variable name:
   - **Visual name** in the zenon Editor is empty: The visual name in the Metadata database remains unchanged.
   - **Visual name** in the zenon Editor is configured: The **Visual name** in the zenon Editor is entered as the Visual name in the Metadata database. Visual names changed in the Metadata Editor are overwritten.

## 20.3.7 Archives

To make changes for archives:

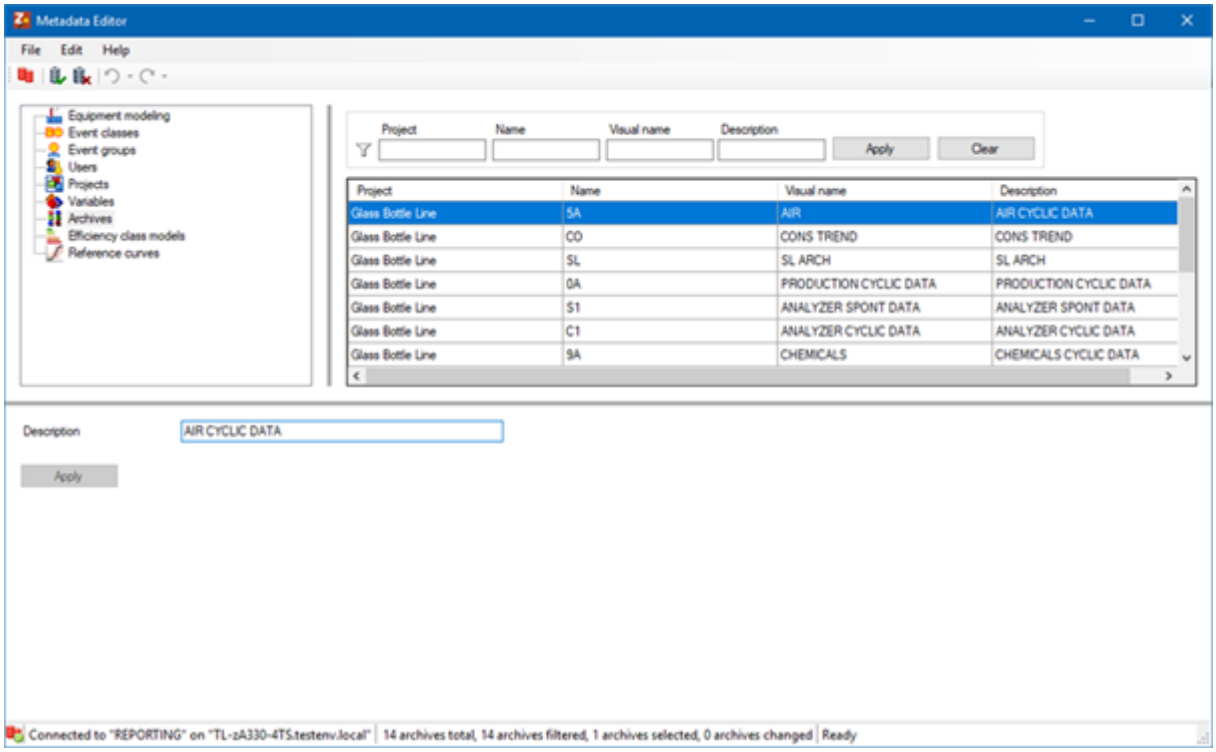
1. Select, in the **Object type Window**, the **Archive** area.

2. If necessary, filter the list in the **Window Object Selection.**

   Highlight the desired entry.

   **Note:** You can also change the description for several objects at the same time.

3. Enter the desired changes in the **editing area**.
4. Click on the button **Apply**.
5. Click on the **Save changes** symbol to write the changes to the database.

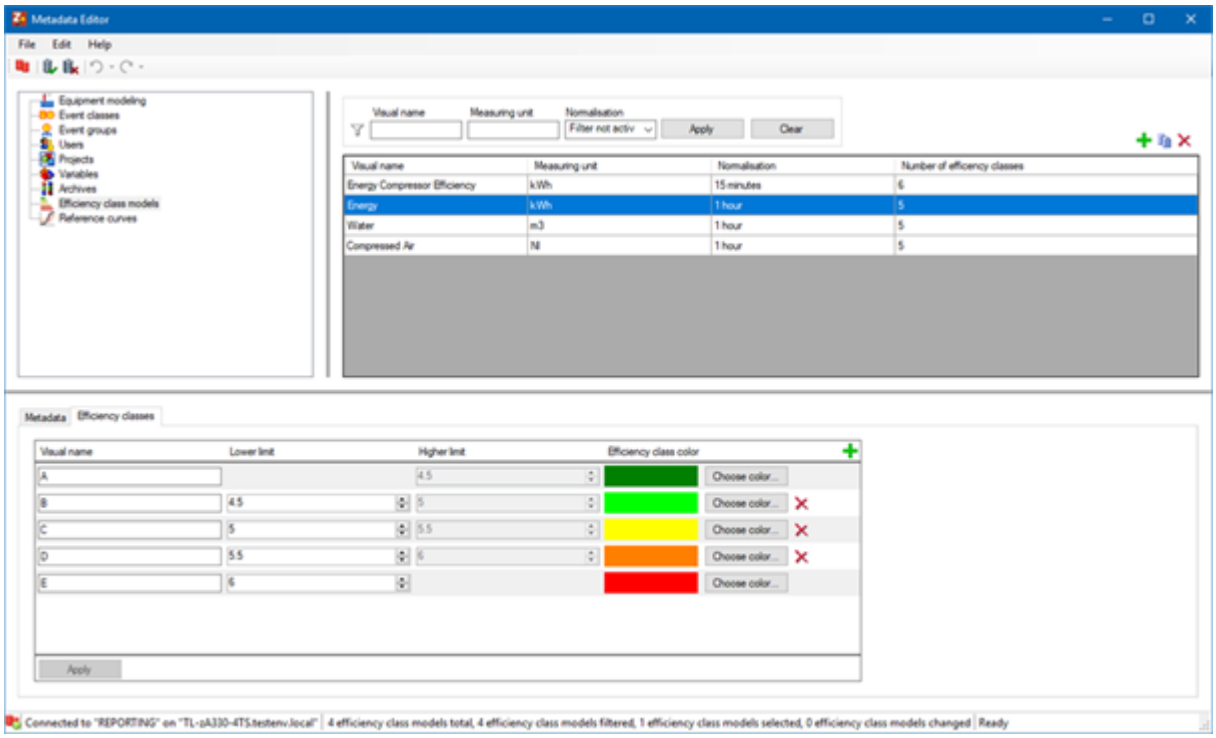



| Option | Description |
|---|---|
| **Object type window** | Selection of the object type, for which objects are to be changed. |
| **Object selection window** | Selection of the archives to be changed.<br>The objects:<br>▸ Can be filtered<br>▸ Are selected by clicking on the line (multiple selection is possible)<br>▸ Are highlighted in red if they have been changed (the highlighting is also retained if the change is undone.)<br>▸ Each line is an entry. |

| Option | Description |
|---|---|
| **Filter** | Entry of filter criteria for the list of the event classes.<br><br>It is possible to filter according to:<br>▸ **Project**<br>▸ **Name**<br>▸ **Visual name**<br>▸ **Description**<br><br>Wildcards can be used:<br>▸ *****: any desired number of any desired characters<br>▸ **?**: precisely 1 desired character.<br><br>If a filter text does not contain a wild card, a ***** is automatically added. |
| **Apply** | Applies filter to list. |
| **Delete** | Resets filter |
| **Editing area** | Entry and acceptance of changes. |
| **Visual name** | Display only.<br>Changes are not possible. |
| **Description** | Entry to change the description of archives.<br><br>**Note:** If several objects with different descriptions are selected for change, the original description of the last element selected is displayed in red. Changes have an effect on all highlighted objects. |
| **Apply** | Clicking on the button accepts the changes. These are only written by clicking on the command or the **Save changes** symbol in the database.<br><br>Only available if a change has been made and no rules have been broken. |

## 20.3.8 Efficiency class models

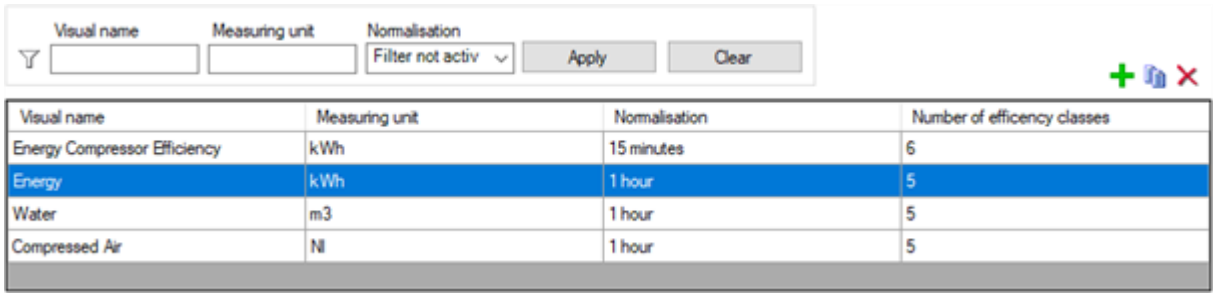
Efficiency class models are administered in the **Object selection** window. In the **Editing area**, the attendant metadata is edited and efficiency classes are created and edited.




| Option | Description |
|---|---|
| **Object type window** | Selection of the object type, for which objects are to be changed. For efficiency class models, click on the symbol in the tree. |
| **Object selection window** | Selection of the efficiency class models to be edited.<br>The objects:<br>▸ Can be filtered<br>▸ Are selected by clicking on the line (multiple selection is possible)<br>▸ Are highlighted in red if they have been changed (the highlighting is also retained if the change is undone.)<br>Each line is an entry. |
| **Editing area** | Entry and acceptance of changes. |

## ADMINISTER EFFICIENCY CLASS MODELS

Efficiency class models are displayed in the **Object selection** window. They can be filtered, as well as newly created, duplicated and deleted.




**Key:**

- : new
- : duplicate
- : delete

### FILTER

| Option | Description |
|---|---|
| **Filter** | It is possible to filter according to:<br>▸ **Visual name**: Filtering according to visual name. Use of wild cards is possible.<br>▸ **Measuring unit**: Filtering according to measuring unit. Use of wild cards is possible.<br>▸ **Normalization**: Filtering for time normalization. Select from drop-down list.<br>Filtering with wild cards:<br>▸ *: any desired number of any desired characters<br>▸ ?: precisely 1 desired character.<br>If a filter text does not contain a wild card, a * is automatically added. |
| **Apply** | Applies filter to list. |
| **Delete** | Resets filter |

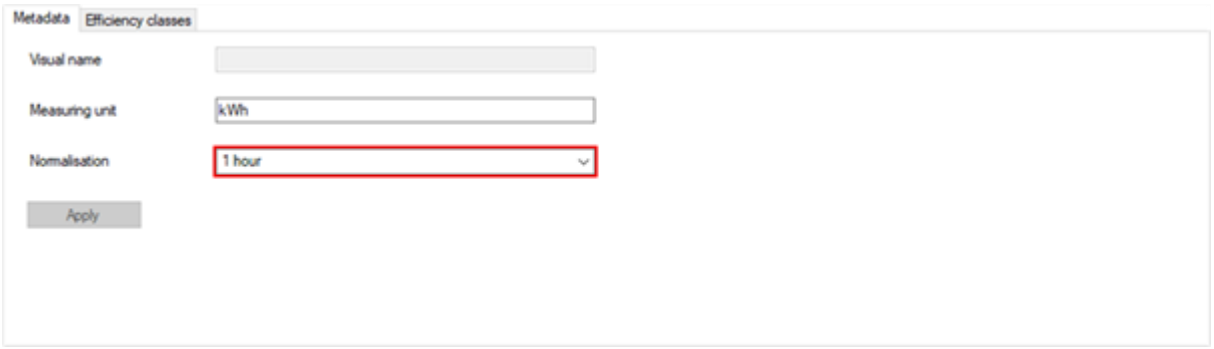
### LIST OF EFFICIENCY CLASS MODELS

| List of efficiency class models | **Lists all existing efficiency class models. The following is displayed for each model:**<br>**Visual name:**<br>**Name that is displayed with the model.**<br>**Measuring unit:**<br>**Selected measuring unit**<br>**Normalization:**<br>**Selected time normalization**<br>**Number of efficiency classes:**<br>**Amount of efficiency classes contained in the model.**<br>**Several models can be selected at the same time. For selected models, the following is possible in the editing area:**<br>**Metadata (on page 478) can be configured**<br>**Efficiency classes (on page 479) can be created and edited** |
|---|---|
| Symbol: **New** | Active if there is a connection to the database.<br>Clicking creates a new line for the configuration of a new efficiency class model, resets any existing filter and selects the new model for editing. |
| Symbol: **Duplicate** | Active if there is a connection to the database and at least one model has been selected.<br>Creates a duplicate of all selected models and opens the dialog to configure the duplicated models. Once the dialog has been confirmed with OK, the duplication is carried out, any existing filter is reset and the duplicated models are selected for editing. |
| Symbol: **Delete** | Active if there is a connection to the database and at least one model has been selected.<br>Deletes the selected modles without requesting confirmation. |

## 20.3.8.1 Metadata

Metadata for the efficiency class models is configured in the **editing area** window in the **Metadata** tab.

The inputs are always applicable for all selected efficiency class models.
Fields that have different configurations for different models are marked in red.




| Option | Description |
|---|---|
| **Visual name** | The visual name must not be empty and must be unique throughout the database.<br><br>A change is only possible if precisely one efficiency class model has been selected. |
| **Measuring unit** | Configuration of the unit of the selected efficiency class models. If several models with different units are selected, this is highlighted by the amended red font color. |
| **Normalisation** | Configuration of the time normalization of the selected efficiency class models. If several models with different time normalization are selected, this is highlighted by a red border. |
| **Apply** | Only active if a change has been made and the visual names are valid or the input field has been deactivated for the visual name.<br><br>Clicking on the button saves the changes for the selected efficiency class models.<br><br>**Attention:** Unsaved changes in the **Efficiency classes** (on page 479) tab |

| Option | Description |
|---|---|
| | are lost in the process. |

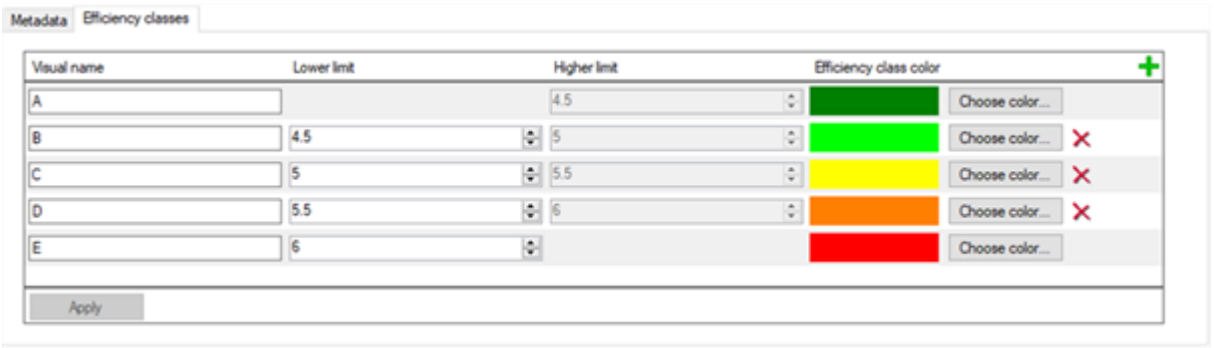
## NORMALIZATION AND SYNCHRONIZATION

Data for efficiency classes must be normalised for use in the zenon Analyzer. Data from the zenon Editor are never normalised. Normalisation can only be configured in the Metadata Editor.
During synchronization, the **Metadata Synchronizer** checks whether the efficiency class model already exists in the Metadata database:

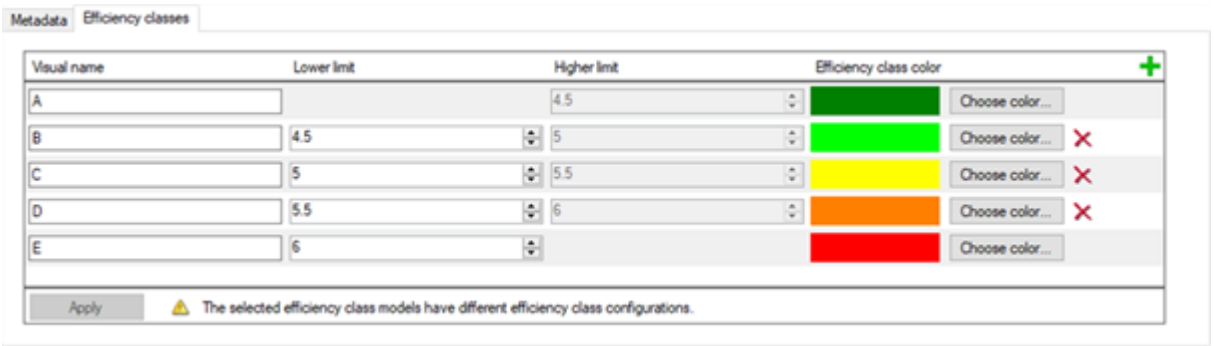
- efficiency class model is not present: no normalisation is present. This must be configured in the Metadata Editor.
- Efficiency class model is present: The normalisation present in the Metadata database remains unchanged.

## 20.3.8.2 Efficiency classes

Efficiency classes for the efficiency class models are configured in the **editing area** window in the **Efficiency classes** tab.




The inputs are always applicable for all selected efficiency class models.
If different models have different configurations, this is shown by a message next to the **Apply** button.



**Key:**

- : new
- : delete

Configuration:

| Option | Description |
|---|---|
| **Symbol: New** | Clicking on the button adds a new efficiency class with an upper and lower limit. |
| **Visual name** | Entry of the visual name of the efficiency class. This must be unique within a model. |
| **Lower limit** | Configuration of the lower limit.<br>There is exactly one class without a lower limit for each model. |
| **Highest value** | Configuration of the upper limit.<br>There is precisely one class without an upper limit for each model. |
| **Efficiency class color** | Configuration and preview of the color of the efficiency class.<br>- **Preview field**: Shows the currently configured color.<br>- **Color** button: Click to open the color palette for selecting a color. If this dialog is closed by clicking on OK, the selected color is accepted. |
| **Symbol: Delete** | Only present for efficiency classes with an upper limit and lower limit. Clicking on the button deletes the efficiency class for the attendant parts without requesting confirmation. |
| **Apply** | Only active if a change has been made and the visual names of all efficiency classes per model are unique and not empty.<br>Clicking on the button validates the entries. If no validation errors are discovered, the configured efficiency classes for the selected efficiency class models are saved.<br>**Attention:** Unsaved changes in the **Metadata** (on page 478) tab are lost in the process.<br>**Note:** The warning next to the button is only visible if efficiency classes with different efficiency configurations have been selected. |

### VALIDATION

When clicking on the button, the following validations are carried out before saving:

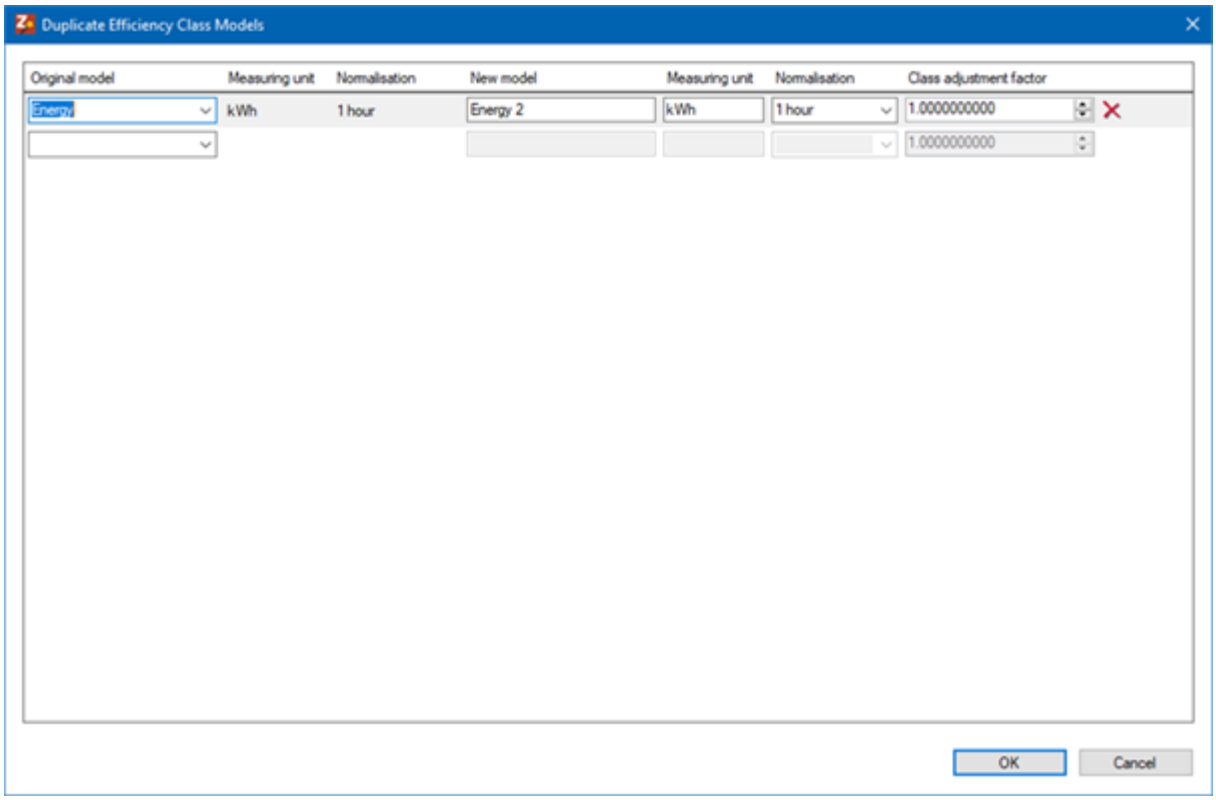
- All efficiency classes are checked for valid areas: Upper limit > Lower limit, if there are both.
- A check for limit clashes is made.
  Clash: 2 classes have the same upper limit or the same lower limit.
- Check to see whether all efficiency classes connect to each other cleanly:
  - Starting with class without lower limit.
  - Ordered in ascending sequence up to class without upper limit.
  - There must be no overlaps or gaps.

If validation errors are discovered, these are shown as an error message in a **Popup**.

## 20.3.8.3 Duplicate Efficiency Class Models

Clicking on the **Duplicate** symbol in the **Object selection** window of the efficiency class models opens a dialog with the efficiency class models to be duplicated. These can be configured here. Further models for duplication can also be added.

For duplication, the selected original models are shown in the left area of the dialog. The attendant duplicates can be configured in the right area.



**Key:**

- ✕: delete

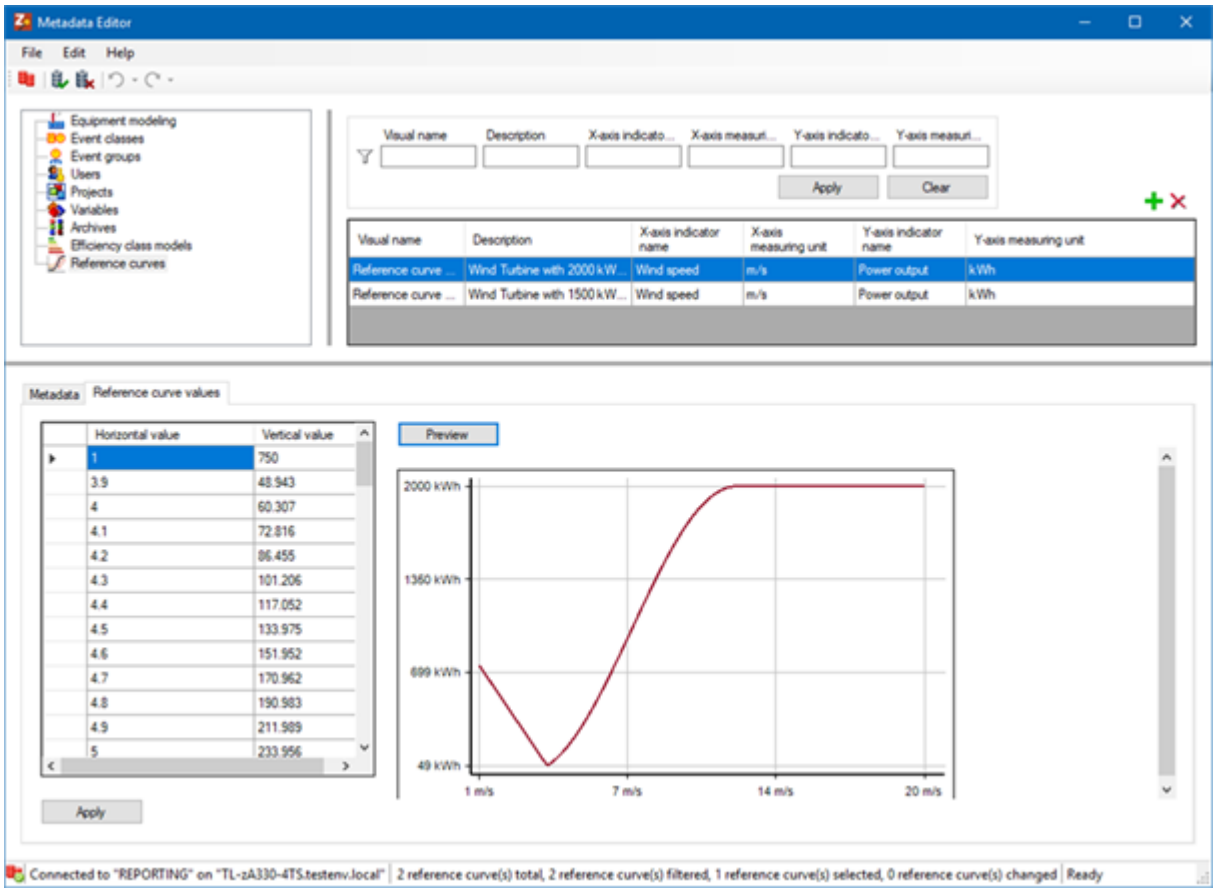
Configuration:

| Option | Description |
|---|---|
| **Original model** | Display of the visual name of the original model for the duplicate. There is already a cell entered for all models selected in the **Efficiency class models** (on page 475) dialog.<br>Further models can be added for duplication.<br>To do this, select a model from the drop-down list in the empty entry of the last lines.<br>All other input fields are activated and visible as a result of this. If there is then no line for a new duplicate, a new line for a new duplicate is added. |
| **Measuring unit** | Display of the measuring unit of the original model. |
| **Normalisation** | Display of the time normalization of the original model. |
| **New model** | Entry of the visual name of the duplicate.<br>For this, the following applies:<br>- The name must be unique throughout the database.<br>- The initial value is the visual name of the original model with a counter appended. |
| **Measuring unit** | Input of the measuring unit of the dublicate.<br>In doing so, the following applies:<br>- The initial value is the measuring unit of the original model. |
| **Normalisation** | Configuration of the time normalization of the duplicate.<br>For this, the following applies:<br>- The original value is the normalization of the original model.<br>- If this setting is changed, the **class adjustment factor** is reinitialized. |
| **Class adjustment factor** | Configuration of the adjustment factor for the class boundaries in the duplicate model using a counter element.<br>When duplicating, the classes in the duplicate model are generated as follows:<br>- The classes from the initial model are duplicated. |

| Option | Description |
|---|---|
| | ▸ Their limits are then multiplied by the factor set here.<br><br>When initializing, the factor is calculated as follows:<br>**[Minutes of the normalization interval in the initial model]/[Minutes of the normalization interval in the duplicate]**<br>In doing so, the following is applicable:<br>▸ An hour has 60 minutes<br>▸ A day has 24 hours = 1440 minutes<br>▸ A week has 7 days = 7 * 1440 minutes<br>▸ A month has 30 days = 30 * 1440 minutes<br>▸ A quarter has 90 days = 90 * 1440 minutes<br>▸ A year has 365 days = 365 * 1440 minutes |
| **Symbol: Delete** | Clicking on the button deletes the attendant duplicate configuration without requesting confirmation. |
| **OK** | Accepts configuration, closes dialog and shows duplicates in the **Efficiency class models** (on page 475) dialog. |
| **Cancel** | Cancels duplication and closes the dialog. |

## 20.3.9 Reference curves

Reverence curves are administered in the **Object selection** window. In the **Editing area**, the attendant metadata is edited and reverence curves are created and edited.

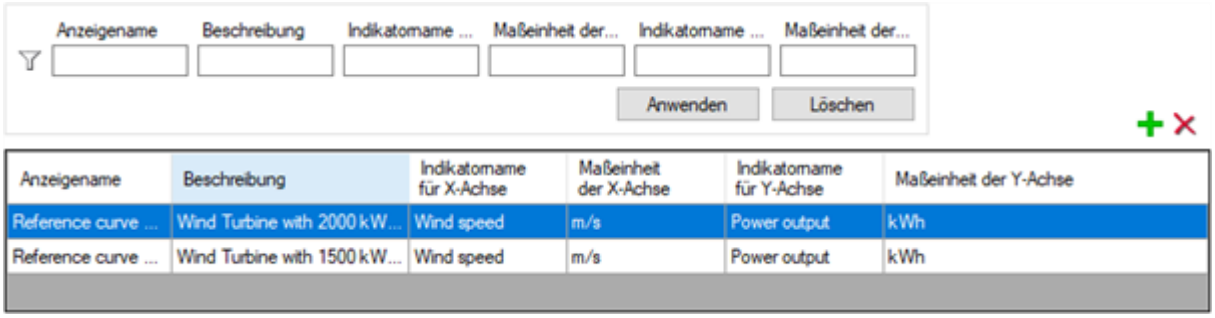



| Option | Description |
|---|---|
| **Object type window** | Selection of the object type, for which objects are to be changed. For reverence curves, click on the symbol in the tree. |
| **Object selection window** | Selection of the reverence curve models to be edited.<br>The objects:<br>▸ Can be filtered<br>▸ Are selected by clicking on the line (multiple selection is possible)<br>▸ Are highlighted in red if they have been changed (the highlighting is also retained if the change is undone.) |

| Option | Description |
|---|---|
| | Each line is an entry. |
| **Editing area** | Entry and acceptance of changes. |

## EDIT REVERENCE CURVES

Reverence curves are displayed in the **Object selection** window. They can be filtered, as well as newly created and deleted.




**Key:**

- +: new
- X: delete

### FILTER

| Option | Description |
|---|---|
| **Filter** | It is possible to filter according to:<br>▸ **Visual name**:<br>Filtering according to visual name.<br>▸ **Description**:<br>Filtering according to description.<br>▸ **X-axis indicator name**:<br>Filtering according to indicator name of the X-axis.<br>▸ **X-axis measuring unit**:<br>According to the measuring unit of the X-axis.<br>▸ **Y-axis indicator name**:<br>Filtering according to the indicator name of the Y-axis. |

| Option | Description |
|---|---|
| | ▸ **Y-axis measuring unit**:<br>Filtering according to the measuring unit of the Y-axis.<br><br>The use of wild cards is possible for the filter. Filtering with wild cards:<br><br>▸ *****: any desired number of any desired characters<br><br>▸ **?**: precisely 1 desired character.<br><br>If a filter text does not contain a wild card, a ***** is automatically added. |
| **Apply** | Applies filter to list. |
| **Delete** | Resets filter |

### LIST OF REFERENCE CURVE MODELS

| | |
|---|---|
| **List of reference curve models** | **Lists all existing reference curve models. The following is displayed for each model:**<br>**Visual name:**<br>**Name that is displayed with the reference curve model.**<br>**Description:**<br>**Description.**<br>**X-axis indicator name:**<br>**Indicator name of the X-axis.**<br>**X-axis measuring unit:**<br>**Selected measuring unit of the X-axis.**<br>**Y-axis indicator name:**<br>**Indicator name of the Y-axis.**<br>**Y-axis measuring unit:**<br>**Selected measuring unit of the Y-axis.**<br>**Several reference curve models can be selected at the same time. For selected models, the following is possible in the editing area:**<br>**Metadata (on page 488) can be configured**<br>**Values of the reference curves (on page 489) can be created and edited** |
| Symbol: **New** | Active if there is a connection to the database.<br>Clicking creates a new line for the configuration of a new reference class model, resets any existing filter and selects the new reference curve model for editing. |
| Symbol: **Delete** | Active if there is a connection to the database and at least one model has been selected.<br>Deletes the selected reference curve models without requesting confirmation. |

## 20.3.9.1 Metadata

Metadata for the reference curves is configured in the **editing area** window in the **Metadata** tab.

The inputs are always applicable for all selected reference class models.
Fields that have different configurations for different models are marked in red.

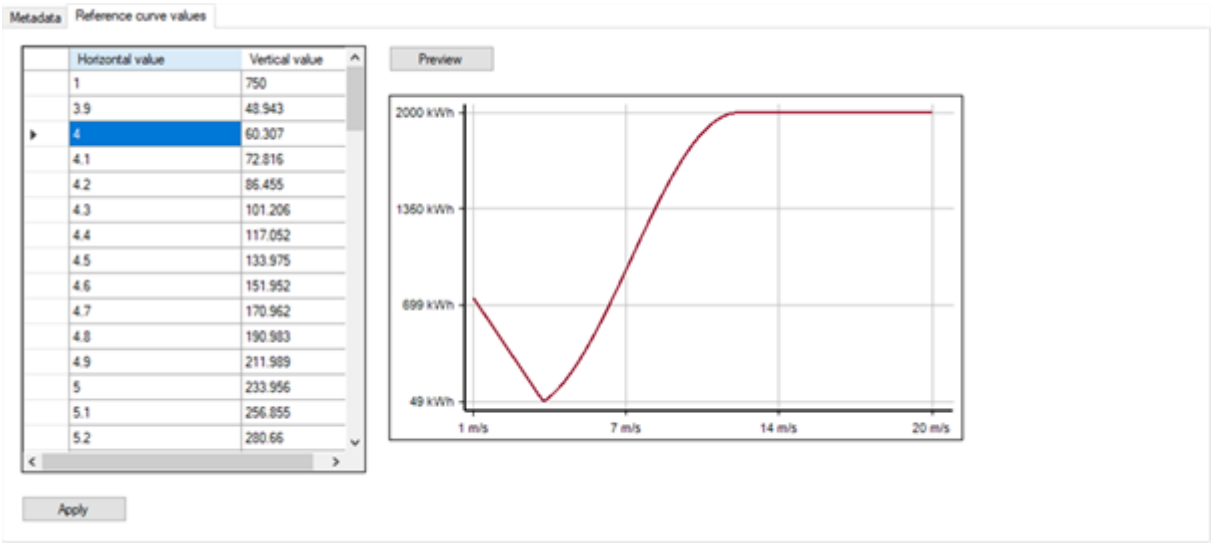
| Option | Description |
|---|---|
| **Visual name** | The visual name must not be empty and must be unique throughout the database.<br><br>A change is only possible if precisely one reverence curve model has been selected. |
| **Description** | Description of the reference curve. |
| **X-axis indicator name** | Indicator name of the X-axis for the selected reference curve models. |
| **X-axis measuring unit** | Unit of the X-axis for the selected reference curve models. |
| **Y-axis indicator name** | Indicator name for the Y-axis. |
| **Y-axis measuring unit** | Unit of the Y-axis for the selected reference curve models. |
| **Apply** | Only active if a change has been made and the visual names are valid or the input field has been deactivated for the visual name.<br><br>Clicking on the button saves the changes for the selected reference class models.<br><br>**Attention:** Unsaved changes in the **Values of the reference curve** (on page 489) tab are lost in the process. |

### Information

If several reference curve models are selected for configuration and their values are different, this is shown in red font in the respective property. When applying the changes, all selected equipment groups are overwritten with the new value.

## 20.3.9.2 Reference curve values

Inputs of the support points of the reference curve are configured in this tab.




The inputs are always applicable for all selected reference class models.
If models with different values are selected, there is a notice next to the **Apply** button.

| Option | Description |
|---|---|
| **Curve input table** | Table for curve input with columns for:<br>▸ **Horizontal value** (X-axis)<br>▸ **Vertical value** (Y-axis)<br>Edit table:<br>▸ Add line: Enter a value into the lowest line in the cell, the value for **horizontal value**. A new line is created underneath.<br>▸ Delete: Click on the cell in the line that is furthest to the left. The line is highlighted. Press the **DEL** key.<br>The following is applicable for the the configuration of the table:<br>▸ Values for **horizontal value** must be unique in the table and ascending.<br>▸ No empty cells can be present, with the exception of the lowest line.<br>▸ Entered values must be able to be converted to floating point numbers with double precision. |
| **Preview** | Clicking on the button shows the configured values as a preview screen. |
| **Preview area** | The table content is validated by clicking on the **Preview** button and a preview is displayed on the diagram. |
| **Apply** | Only active if a change has been made.<br>Clicking on the button validates the entries. If no validation errors are discovered, the configured reference curves for the selected reference class models are saved.<br>**Attention:** Unsaved changes in the **Metadata** (on page 488) tab are lost in the process.<br>**Note:** The warning next to the button is only visible if reference curve models with different reference curve configurations have been selected. |

## 20.4 Menu, toolbar and status line

The menu and toolbar offer a range of commands to administer the Metadata Editor.

**Note:** The menu is only available if the **Metadata Editor** is started from ZAMS as an EXE file, but not the control in zenon Runtime.

### MENU

#### FILE

Commands for general operations.

| Entry | Description |
|---|---|
| **Establish connection** | Opens the dialog (on page 496) to create a connection.<br>**Note:** If the dialog to create a connection is confirmed by clicking on **OK**, then a new attempt to establish a connection is made. Unsaved changes are then discarded without confirmation being requested. |
| **Apply changes** | Saves all changes made in the database. |
| **Discard Changes** | Discards all changes made since the last save after requesting confirmation. |
| **Settings** | Opens the dialog (on page 493) to configure the settings. |
| **Exit** | Closes the Manual Data Editor. |

#### EDIT

Commands for repeating and undoing actions.

| Entry | Description |
|---|---|
| Undo | Undoes the last action. |
| Redo | Restores the last undone action |

#### HELP

Link to help and version information.

| Entry | Description |
|---|---|
| **Info about** | Opens a window with information on the current version. |

| Entry | Description |
|---|---|
| **Help** | Opens online help. |

## TOOLBAR

| Symbol | Description |
|---|---|
| **Establish connection** | Opens the dialog (on page 496) to create a connection.<br><br>**Note:** If the dialog to create a connection is confirmed by clicking on **OK**, then a new attempt to establish a connection is made. Unsaved changes are then discarded without confirmation being requested. |
| **Save changes** | Saves all changes made. |
| **Discard Changes** | Discards all changes made since the last save after requesting confirmation. |
| **Undo** | Clicking on the symbol undoes the last action.<br><br>Clicking on the arrow of the drop-down list opens a window to select actions that are to be undone. Only the last chronological action or other subsequent actions can be undone as a block. |
| **Redo** | Clicking on the symbol restores the last undone action.<br><br>Clicking on the arrow of the drop-down list opens a window to select actions that have been undone that are to be restored. Only the last chronological action or other subsequent actions can be restored as a block. |

## STATUS LINE

Informs you of the connection and objects.
Separator: |

| Item | Description |
|---|---|
| **Symbol** | Shows the connection status.<br><br>The following are possible as a status: |

| Item | Description |
|---|---|
| | ▸ No connection established<br>▸ Connection established but the Analyzer server license is not valid<br>▸ Connection established and the Analyzer server license is valid<br>▸ Secured connection established, the license is valid<br>▸ Secured connection established, the license is invalid |
| **Connection information** | Information on the active connection. Display of the server and the database. |
| **Information [Objects], total** | Information on the number, selection and status of the selected objects.<br>Separator: /<br>**Note:** If changes are undone, then the counter for the number of changed objects is not decremented but keeps its value. |
| **Action** | Information on current action |

## 20.5 Options

In this dialog, you configure:

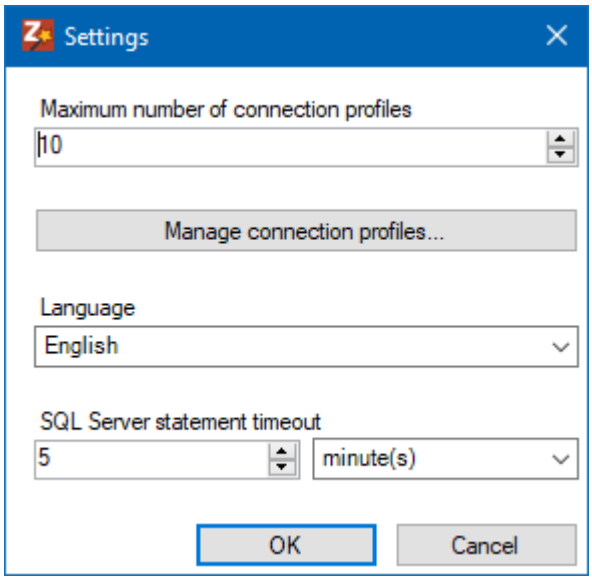
- The number of permitted connection profiles
- Administration of the connection profiles
- The language of the user interface of the Editor

To configure the settings:

1. Open the menu **File**
2. Select the command **Settings**.

   The dialog for configuring settings is opened

## SETTINGS DIALOG




| Option | Description |
|---|---|
| **Maximum number of connection profiles** | Defines how many connection profiles can be created as a maximum for the Editor:<br>▸ Minimum: *1*<br>▸ Maximum: *255*<br>▸ Default: *10*<br>Configuration by manual entry or by clicking on arrows.<br>**Note:** Because the ZAMS connection profile can also be displayed in the dialog for establishing a connection (on page 496), more than the permitted amount of connection profiles can be displayed in the drop-down list to select a profile. |
| **Manage connection profiles** | Opens the dialog (on page 39) to manage the connection profiles. |
| **Language** | Selection of the desired language for the user interface of the Editor from a drop-down list. |
| **SQL Server statement timeout** | Entry of the SQL server statement timeout.<br>This timeout enters into force if an individual SQL Statement runs for longer than is defined here, for example when backing up or when restoring a large database. With new connections, the currently-set value is used for the Timeout. If this is amended in the options, the existing connections are amended to the new value.<br>The Timeout can be set to a value between *1* minute and *7* days. |

| Option | Description |
|---|---|
| | **Input elements:**<br>- Number element:<br>Entry of the quantity in the field directly or by means of the arrow keys.<br>Possible values for :<br>- days: *1 - 7*<br>- hours: *1 - 168*<br>- minutes: *1 - 10080*<br>- Drop-down list for granularity:<br>Possible values:<br>- minutes<br>- hours<br>- *days*<br>This selection influences the value range of the number element.<br>Default:*5 minutes* |
| **OK** | Applies settings and closes the dialog. |
| **Cancel** | Discards all changes and closes the dialog. |

# 21 Manual Data Editor

The **Manual Data Editor** makes it possible, in a zenon Analyzer metadata database, to edit the tables for prices, standards and degree days and to link these to variables. The **Manual Data Editor** is a separate application. This can be started for editing directly from ZAMS, from the start menu item or directly via the file.

## ZAMS

To open the **Manual Data Editor** in ZAMS:

1. Navigate to the **Options** ribbon in ZAMS.
2. Select the **Manual Data Editor** entry.

   The **Manual Data Editor** is started. At the same time, the dialog to establish a connection (on page 496) is opened.

**Start as stand-alone application:**

- In the Windows Start menu, select the **COPA-DATA -> Manual Data Editor.** entry.
  The **Manual Data Editor** is started.

### KEYBOARD SHORTCUTS

The following key combinations are available for use in the Editor:

| Key combination | Description |
|---|---|
| **F1** | Opens help |
| **Ctrl+Shift+C** | Opens the dialog for creating a database backup. |
| **Ctrl+S** | Saves changes. |
| **Alt+F4** | Closes the CD_PRODUCTNAME Editor |
| **Ctrl+Z** | Undo input |
| **Ctrl+Y** | Repeat input. |

## 21.1 Connect

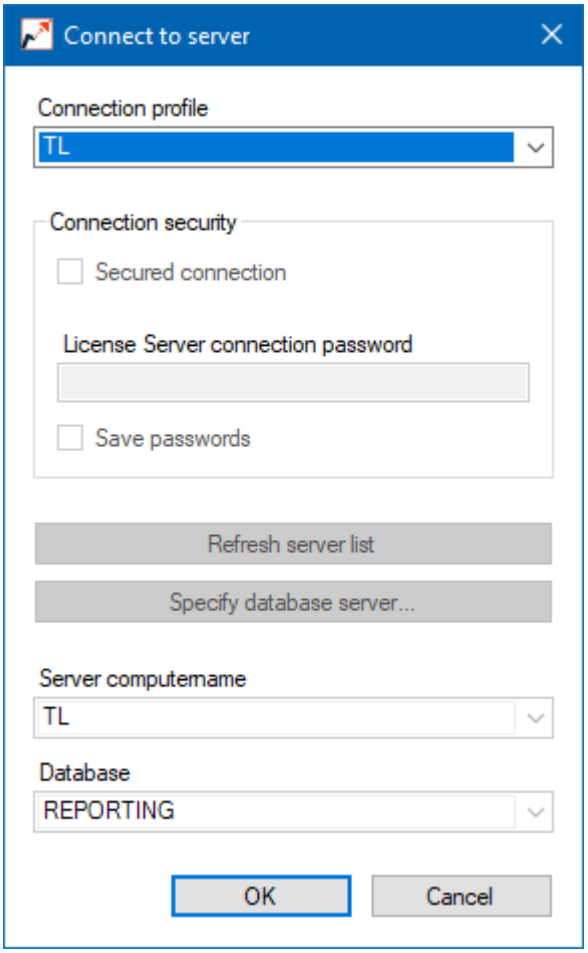
The **Manual Data Editor** administers its connection profiles. The ZAMS connection profiles are also read on startup. If there are profiles in the **Manual Data Editor** and in ZAMS profiles with the same names, the connection profile of **Manual Data Editor** dominates.

To connect the **Manual Data Editor** to a database:

1. Start the **Manual Data Editor** as a Stand alone Tool from the start menu or using the **EXE** file from the options in ZAMS.
   If the **Manual Data Editor** has already been opened, select the **Establish connection** command in the **File** menu.

   The dialog to connect to a server is opened.

2. Select the desired connection by clicking on **Connection profile** or create a new connection (on page 75) in a similar manner to that of ZAMS.




Note: In this connection dialog, no change password is required for secure communication.

3. Click on **OK**.

   a) The connection is created.

   b) The user authorization is queried by the license server

   c) The database is checked to see that it is correct.
   Note: No connection is established if there are incorrect structures or versions.
   Conversion (on page 182) is only possible with ZAMS.

   d) Data is loaded

   e) The license is obtained.
   Errors when obtaining the license are shown in a pop-up.

   f) The loaded data is displayed in the Manual Data Editor.

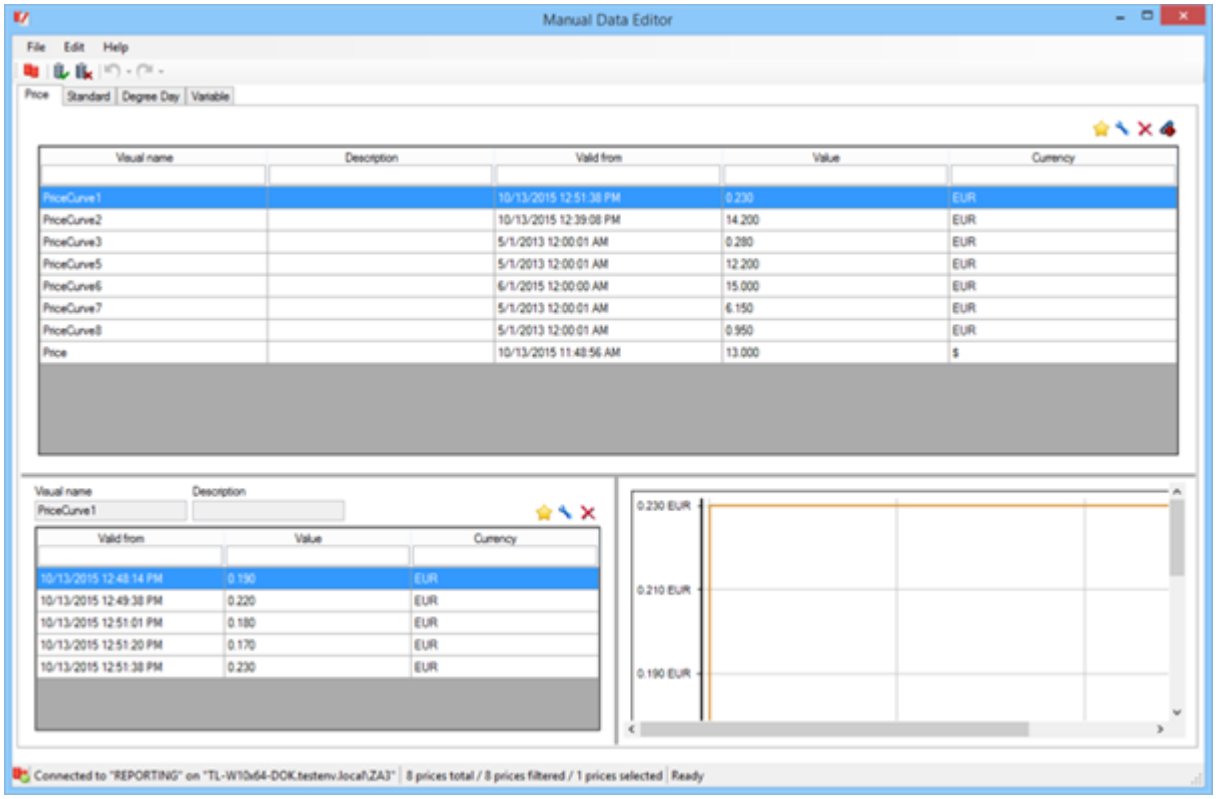
**Note:** Unsaved changes are lost without warning when the connection is established.

## 21.2 Main window

The main window shows the definitions present in the currently-connected database or variables for the respective tab that is open.
The following are available:

- **Price** (definitions)
- **Standard** (definitions)
- **Degree day** (definitions)
- **Variable** (variables)

All entries can be sorted and filtered (on page 524). The **Price** tab is displayed on starting. All existing data is shown as unfiltered.




| Range | Description |
|---|---|
| **Menu line** (on page 499) | Menu items for:<br>▸ **File**: Creating, amending and administering entries for the connection, settings and closing the Manual Data Editor.<br>▸ Edit: Entries for Undoing entries for entries and repeating entries.<br>▸ **Help**: Versions and link to online help. |

| Range | Description |
|---|---|
| **Tool Bar** (on page 499) | Allows the following actions:<br>▸ **Establish connection**: Opens the dialog (on page 496) for creating a connection.<br>▸ **Accept changes**: Saves changes made.<br>▸ **Discard Changes**: Rejects changes made.<br>▸ **Undo**: Undoes the last action.<br>▸ **Redo**: Repeats the last action. |
| **List of definitions/variables** | Display and configuration of the configured trends, standards, degree day definitions or variables, depending on the current tab. |
| **Horizontal separator** | Allows the size ratios to be moved between **List** and entries with the mouse. |
| **Entries** | Display and configuration of entries, depending on the selected tab and variables.<br>Decimal points are displayed up to maximum of 3 places. |
| **Diagram** | Visualization of the data configured in the **entries**.<br>The diagram is automatically updated each time the values are changed. |
| **Vertical separator** | Allows the size ratios to be moved between list of entries and diagram. |
| **Status line** | Notice of linking and the current action.<br>▸ **Symbol**: Shows the connection status.<br>▸ **Text**: Provides connection status including linked server and linked database.<br>▸ **Text**: Display of the number of objects for total number, filtered and selected.<br>▸ **Text**: Current process. |

## 21.2.1 Menu, toolbars and status line

The menu and toolbar offer a range of commands to administer the Manual Data Editor and the filter rules.

# MENU

## FILE

Commands for general operations.

| Entry | Description |
|---|---|
| **Establish connection** | Opens the dialog (on page 496) to create a connection.<br>**Note:** If the dialog to create a connection is confirmed by clicking on **OK**, then a new attempt to establish a connection is made. Unsaved changes are then discarded without confirmation being requested. |
| **Apply changes** | Saves all changes made to variables in the database. |
| **Discard Changes** | Discards all changes made to variables since the last save after requesting confirmation. |
| **Settings** | Opens the dialog (on page 527) to configure the settings. |
| **Exit** | Closes the Manual Data Editor. |

## EDIT

Commands for repeating and undoing actions.

| Entry | Description |
|---|---|
| **Undo** | Undoes the last action. |
| **Redo** | Restores the last undone action |

## HELP

Link to help and version information.

| Entry | Description |
|---|---|
| **Info about** | Opens a window with information on the current version. |
| **Help** | Opens online help. |

# TOOLBAR EDITOR

| Symbol | Description |
|---|---|
| **Establish connection** | Opens the dialog (on page 496) to create a connection.<br>**Note:** If the dialog to create a connection is confirmed by clicking on **OK**, then a new attempt to establish a connection is made. Unsaved changes are then discarded without confirmation being requested. |
| **Apply changes** | Saves all changes made to the price history and norm history. |
| **Discard Changes** | Discards all changes made to the price history and norm history since the last save after requesting confirmation. |
| **Undo** | Clicking on the symbol undoes the last action.<br>Clicking on the arrow of the drop-down list opens a window to select actions that are to be undone. Only the last chronological action or other subsequent actions can be undone as a block. |
| **Redo** | Clicking on the symbol restores the last undone action.<br>Clicking on the arrow of the drop-down list opens a window to select actions that have been undone that are to be restored. Only the last chronological action or other subsequent actions can be restored as a block. |

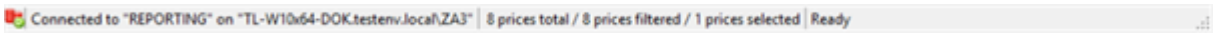
## TOOLBAR LIST

| Symbol | Description |
|---|---|
| **New** | Opens dialog of the respective object to create a new entry. |
| **Edit** | Opens the dialog to edit the selected object. |
| **Delete** | Deletes selected objects after a confirmation message. |
| **Import** | Opens dialog (on page 519) to select a file for import. |
| **Show linked variables** | Opens a dialog dialog (on page 527) to display the linked variables.<br>With multiple selection, the variables for last-selected object are displayed. |

**Note:** The symbols that are displayed depend on the selected tab.

### STATUS LINE

Informs you of the connection and objects.
Separator: |




| Element | Description |
|---|---|
| **Symbol** | Shows the connection status.<br>The following are possible as a status:<br>▸ No connection established<br>▸ Connection established but the Analyzer server license is not valid<br>▸ Connection established and the Analyzer server license is valid<br>▸ Secured connection established, the license is valid<br>▸ Secured connection established, the license is invalid |
| **Connection information** | Information on the active connection. Display of the server and the database. |
| **Information [Objects], total** | Information on the number, filtering and election of the objects (prices, standards, variables).<br>Separator: **/** |
| **Action** | Information on current action |

## 21.3 Configuration

In the **Manual Data Editor**, prices, standard values (standards) and/or degree days are defined and linked to variables.

The parameters are defined in the tabs:

- **Price (on page 503)**
- Standard (on page 507)
- Degree day (on page 512)

The definitions are linked to variables in the **Variable** (on page 520) tab.

During configuration, work stages that have not yet been saved are undone and also restored (on page 525) using the corresponding symbols and menu entries. Saving is carried out using the symbol or the **Check in** (on page 525) menu entry.

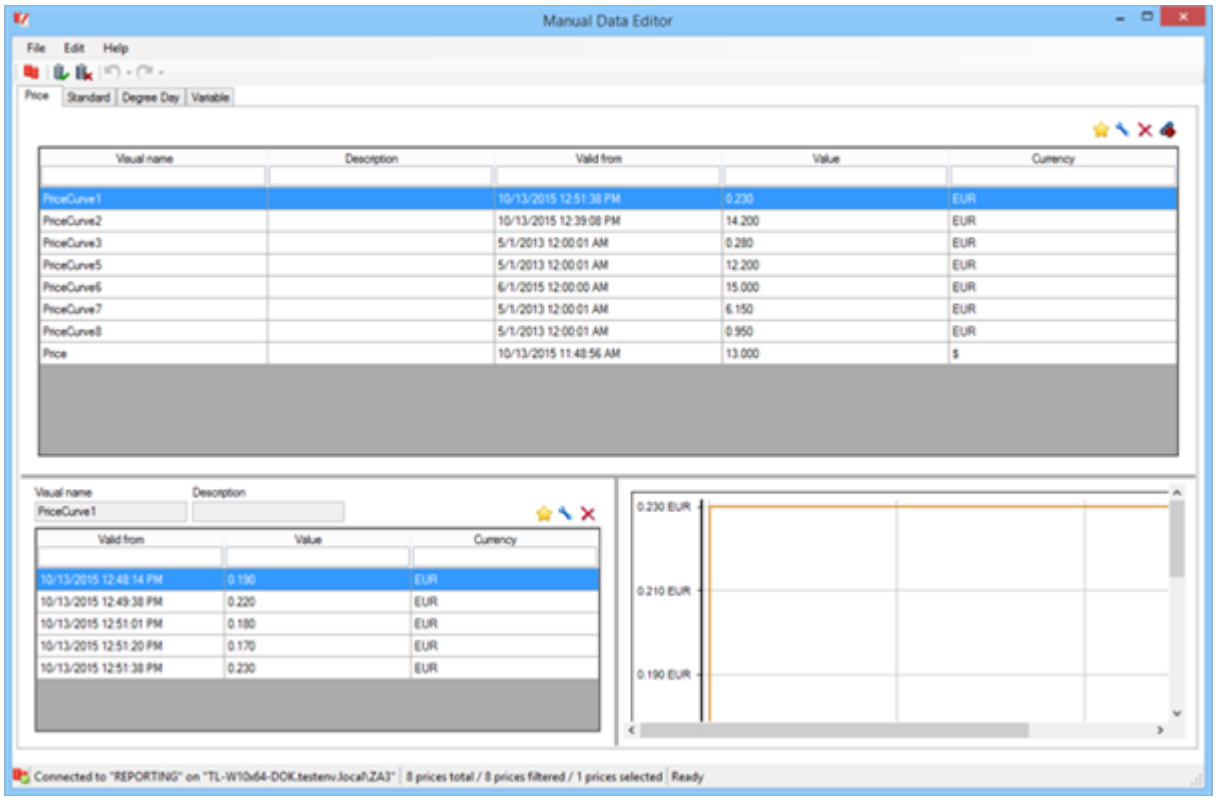
With tables, the column width can be amended by:

- Double-clicking on the column separator
- Drag the mouse to the column separator

## 21.3.1 Price

Prices are configured in this tab.

The tab is divided in three areas:



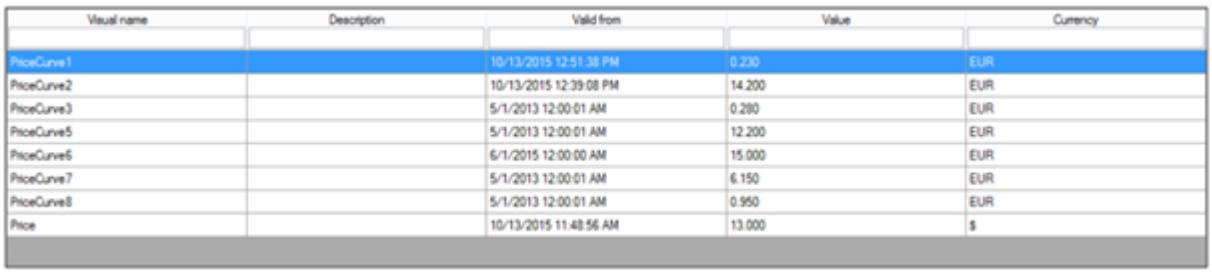

- Price trend: Display and configuration of the price trends (top).
- Price entries: Display and configuration of the price entries (bottom left).
- Diagram: Display of the trend of the defined price entries (bottom right).

### LIST OF PRICE TRENDS

The list contains the configured prices. Configuration is carried out by means of the symbols above the list.

Key:

- : **New**
- : **Edit**
- : **Delete**
- : Show linked variables



| Visual name | Description | Valid from | Value | Currency |
|---|---|---|---|---|
| PriceCurve1 | | 10/13/2015 12:51:38 PM | 0.230 | EUR |
| PriceCurve2 | | 10/13/2015 12:39:08 PM | 14.200 | EUR |
| PriceCurve3 | | 5/1/2013 12:00:01 AM | 0.280 | EUR |
| PriceCurve5 | | 5/1/2013 12:00:01 AM | 12.200 | EUR |
| PriceCurve6 | | 6/1/2015 12:00:00 AM | 15.000 | EUR |
| PriceCurve7 | | 5/1/2013 12:00:01 AM | 6.150 | EUR |
| PriceCurve8 | | 5/1/2013 12:00:01 AM | 0.950 | EUR |
| Price | | 10/13/2015 11:48:56 AM | 13.000 | $ |

| Option | Description |
|---|---|
| **Symbols** | Symbol for the configuration of the price trends.<br>▸ Price curves are created and edited with **New** and **edit**.<br>▸ **Delete** removes the selected price curves after requesting confirmation.<br>▸ With **Show linked variables** (on page 527), all variables linked to the price curve can be displayed. |
| **Visual name** | Unique name of the price trend. |
| **Description** | Description of the price trend. |
| **Valid from** | Date of validity of the most recent price value. |
| **Value** | Value of the most recent price value. |
| **Currency** | Currency of the most recent price value. |

## CREATE AND EDIT PRICE TREND

To create a new price trend:

1. Click on the **New** symbol.

   The dialog (on page 506) to configure a price curve is opened.
2. Please use an unique name.
3. Enter a description (optional).
4. Close the dialog by clicking on **OK**.
5. Configure the desired price entries.

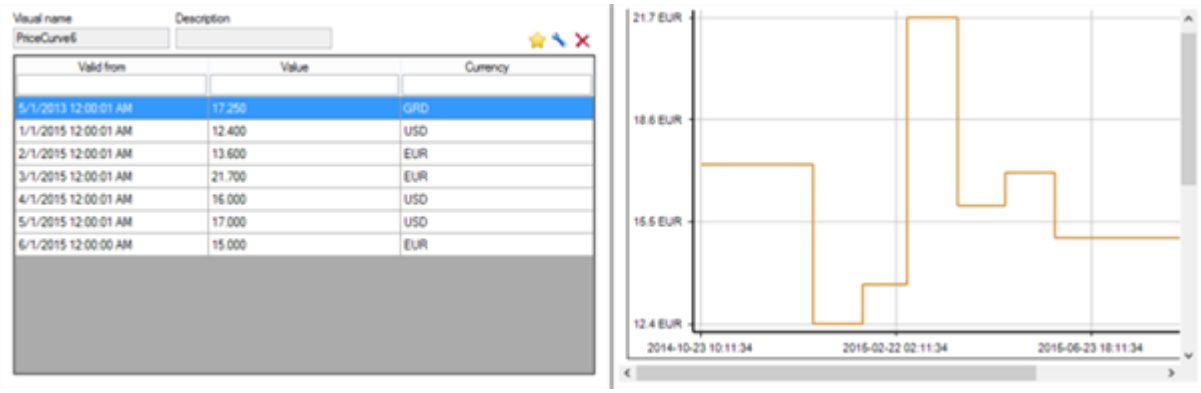
To edit a price curve, click on the **Edit symbol**. Change the desired options in the dialog.

## LIST OF PRICE ENTRIES

In the list of price entries, add the prices to the list of price curves. Their curve is shown in the diagram next to the list.

**Key:**

- : **New**
- : **Edit**
- : **Delete**




| Option | Description |
|---|---|
| **Symbols** | Symbols for the configuration of the prices.<br>▸ Prices are created and edited with **New** and **Edit**.<br>▸ **Delete** removes the selected price after requesting confirmation. |
| **Visual name** | Unique name of the price. |
| **Description** | Description of the price. |
| **Valid from** | Date of validity of the price value. |
| **Value** | Value of the price value. |
| **Currency** | Currency of the price. |

### CREATE AND EDIT PRICE ENTRY

To create a new price entry:

1. Highlight the price curve for which the entry is to be created.
2. Click on the **New** symbol in the list of price entries.

The dialog (on page 507) to configure a price entry is opened.

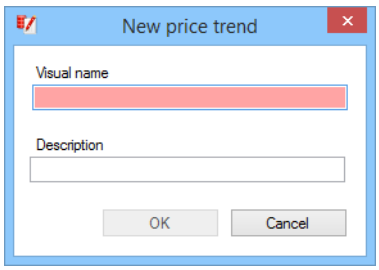
3. Configure the time stamp if necessary.
   This cannot be edited later.
4. Enter the price.
5. Enter the currency.
6. Close the dialog by clicking on **OK**.

**Note:** New values are only applied when saved to the price curve.

To edit a price entry, click on the **Edit** symbol. Change the desired options in the dialog.

### 21.3.1.1 Price curve dialog

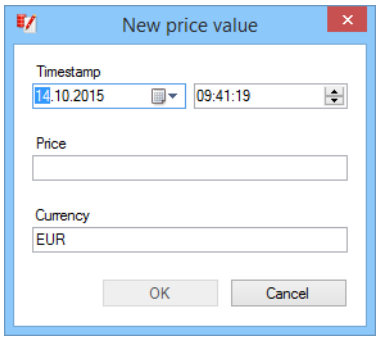
Clicking on the **New** or **Edit** symbol in the list of the price curves opens the dialog to add a new price curve:




| Option | Description |
|---|---|
| **Visual name** | Unique name of the price trend. |
| **Description** | Optional description of the price trend. |
| **OK** | Only active if all inputs are valid. Clicking closes the dialog and adds the new price trend. |
| **Cancel** | Closes the dialog without generating a new price trend. |

### 21.3.1.2 Price entry dialog

Clicking on the **New** or **Edit** symbol in the list of the price entries opens the dialog to add a new price entry:

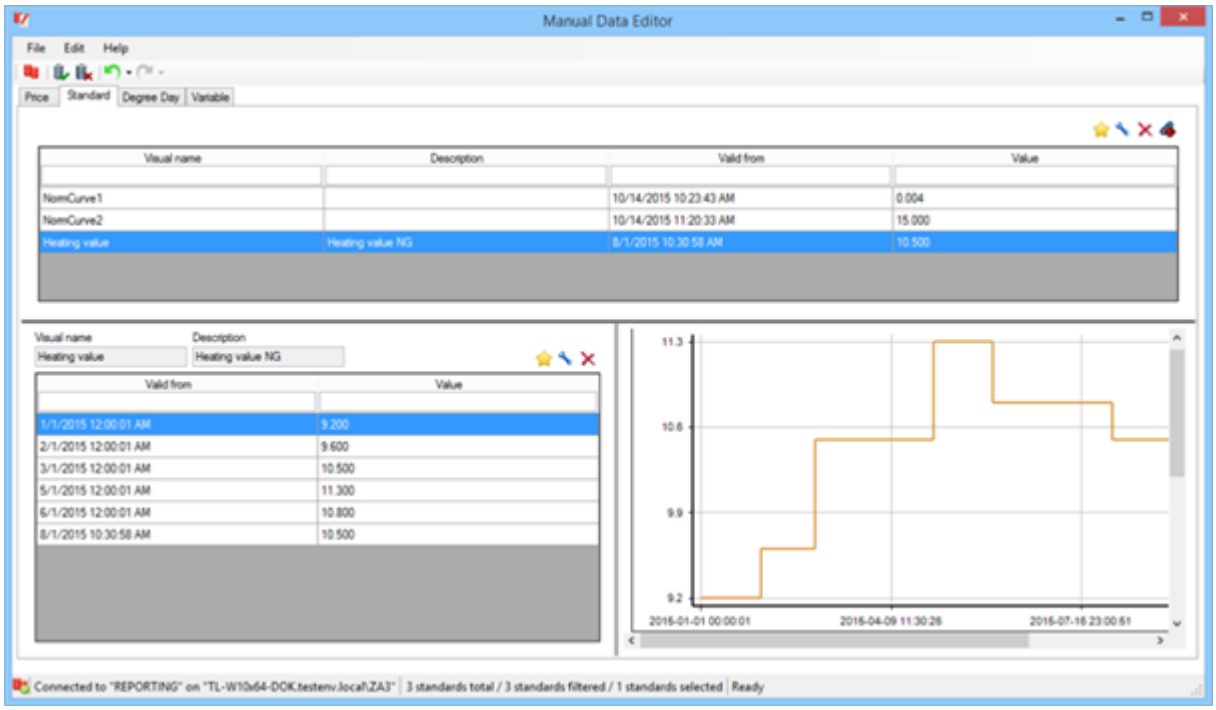



| Option | Description |
|---|---|
| **Timestamp** | Entry of the time point from when the new price entry is valid. This time can also be in the past.<br><br>Input is in:<br><br>▸ **Date field**: Direct input without selection from a calendar. Clicking on the button opens the calendar.<br><br>▸ **Time field**: Direct entry or configuration using the arrow keys.<br><br>A time point is only valid if it does not trigger a time stamp clash.<br><br>**Note:** Only available when creating from scratch. Cannot be edited later. |
| **Price** | Entry of the price. Input errors are not approved and displayed by means of a tooltip. The decimal separator corresponds to the settings of the language. |
| **Currency** | Entry of the currency for this price. Input errors are not approved and displayed by means of a tooltip. |
| **OK** | Only active if all inputs are valid. Clicking closes the dialog and adds the new price entry. |
| **Cancel** | Closes the dialog without generating a new price entry. |

## 21.3.2 Standard

Standards (norms) are configured in this tab.

The tab is divided in three areas:



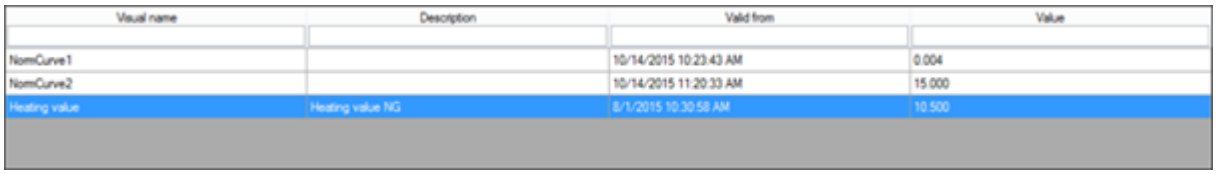

- Standards: Display and configuration of standards (top).
- Default values: Display and configuration of standard values (bottom left).
- Diagram: Display of the trend of the defined standard values (bottom right).

## LIST OF STANDARDS

The list contains the configured standards. Configuration is carried out by means of the symbols above the list.

**Key:**

- : **New**
- : **Edit**
- : **Delete**
- : Show linked variables




| Option | Description |
|---|---|
| **Symbols** | Symbols for the configuration of the standards. |

| Option | Description |
|---|---|
| | ▸ Standards are created and edited with **New** and **Edit**.<br>▸ **Delete** removes the selected standards after requesting confirmation.<br>▸ With **Show linked variables** (on page 527), all variables linked to a standard can be displayed. |
| **Visual name** | Unique name of the standard. |
| **Description** | Description of the standard. |
| **Valid from** | Date of validity of the most recent standard value. |
| **Value** | Value of the most recent standard value. |

### CREATE AND EDIT STANDARD

To create a new standard:

1. Click on the **New** symbol.

   The dialog (on page 511) to configure a standard is opened.
2. Please use an unique name.
3. Enter a description (optional).
4. Close the dialog by clicking on **OK**.
5. Configure the desired standard values.

To edit a standard, click on the **Edit** symbol. Change the desired options in the dialog.

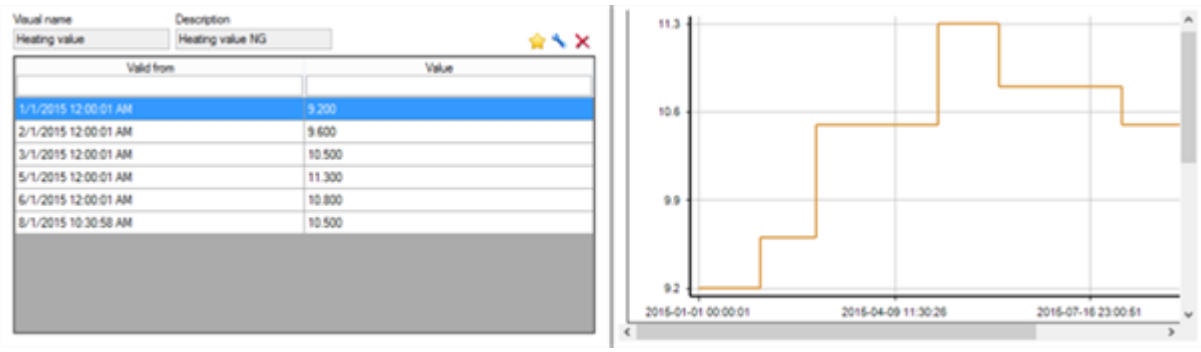
## LIST OF STANDARD VALUES

In the list of standard values, add the standard values to the standards. Their curve is shown in the diagram next to the list.

**Key:**

- : **New**
- : **Edit**

- ✕: **Delete**




| Option | Description |
|---|---|
| **Symbols** | Symbols for the configuration of the standard values.<br>- Standard values are created and edited with **New** and **Edit**.<br>- **Delete** removes the selected standard value after requesting confirmation. |
| **Visual name** | Unique name of the standard value. |
| **Description** | Description of the standard value. |
| **Valid from** | Date of validity of the standard value. |
| **Value** | Value of the standard value. |

## CREATE AND EDIT STANDARD VALUE

To create a new standard value:

1. Highlight the standard for which the entry is to be created.
2. Click, in the list of standard values, on the **New** symbol.

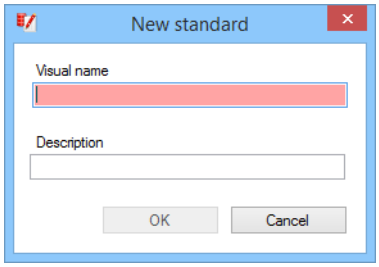
   The dialog (on page 511) to configure a standard value is opened.
3. Configure the time stamp if necessary.
   This cannot be edited later.
4. Enter the value.
5. Close the dialog by clicking on **OK**.

**Note:** New values are only applied when saved to the standard.

To edit a standard value, click on the **Edit** symbol. Change the desired options in the dialog.

### 21.3.2.1 Standards dialog

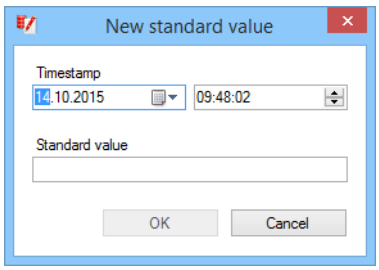
Clicking on the **New** or **Edit** symbol in the list of standards opens the dialog to add a new standard:




| Option | Description |
|---|---|
| **Visual name** | Unique name of the standard. |
| **Description** | Optional description of the standard. |
| **OK** | Only active if all inputs are valid. Clicking closes the dialog and adds the new standard. |
| **Cancel** | Closes the dialog without generating a new standard. |

### 21.3.2.2 Standard value dialog

Clicking on the **New** or **Edit** symbol in the list of standard values opens the dialog to add a new standard value:




| Option | Description |
|---|---|
| **Timestamp** | Entry of the time point from when the new standard value is valid. This time can also be in the past.<br><br>Input is in:<br>▸ **Date field**: Direct input without selection from a calendar. Clicking on the button opens the calendar.<br>▸ **Time field**: Direct entry or configuration using the arrow keys. |

| Option | Description |
|---|---|
| | A time point is only valid if it does not trigger a time stamp clash.<br>**Note:** Only available when creating from scratch. Cannot be edited later. |
| **Standard value** | Entry of the standard value. Input errors are not approved and displayed by means of a tooltip. The decimal separator corresponds to the settings of the language. |
| **OK** | Only active if all inputs are valid. Clicking closes the dialog and adds the new standard value to the list. |
| **Cancel** | Closes the dialog without generating a new standard value. |

### 21.3.3 Degree Day

Degree days are configured in this tab.

## Information

The number of degree days is a location-dependent parameter that reflects local climatic conditions. A distinction is made between:

- **GTZnorm** for the long-term average
- **GTZspez** for the current measurement

**GTZspez** is used for example for the climate adjustment of measured consumption values.

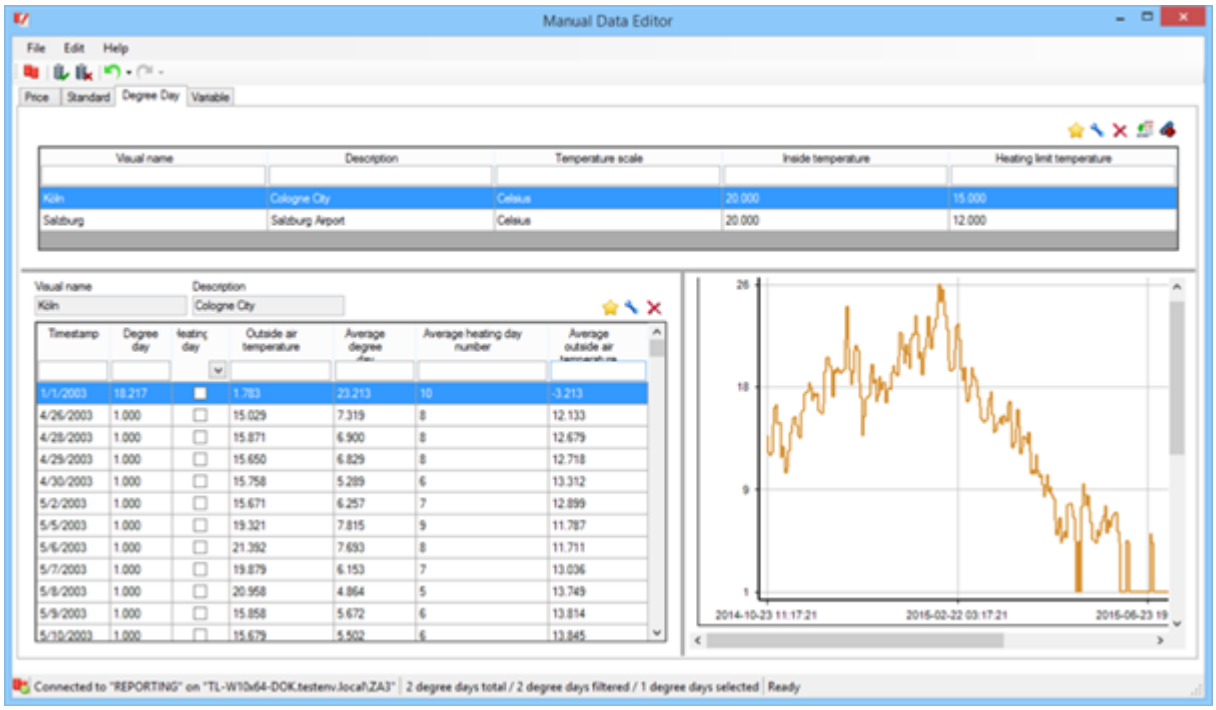
The degree day number $\mathbf{G_t}$ or **GTZ** is calculated as soon as the outside temperature is under the heating limit temperature.

The **GTZ** is the sum of the differences of a stipulated room interior temperature and the respective average daily value of the outside temperature over all days of a time period when the outside temperature is below the heating limit temperature of the building.

**Data for Germany - Austria - Switzerland - Lichtenstein:**

- Germany:
  In accordance with VDI Guideline 2067/DIN 4108 T6, the interior temperature is assumed to be *20° C* and the heating limit as *15° C* (GTZ20/15).
  Temperature values can be obtained from Deutscher Wetterdienst.
  These values can be imported into the **Manual Data Editor**.
- Austria:
  *20° C* is assumed as the interior temperature, the heating limit is *12° C* (HGT20/12).
  Temperature values can be obtained from ZAMG.
- Switzerland and Lichtenstein:
  *20° C* is assumed as the interior temperature, the heating limit is *12° C* (HGT20/12).
  Temperature values can be obtained from MeteoSchweiz.

The **Degree Day** tab is divided into three areas:



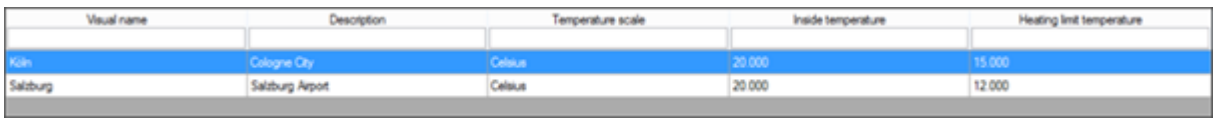

- Degree day definitions: Display and configuration of the degree day definitions (top).
- Degree day values: Display and configuration of the degree day values (bottom left).
- Diagram: Display of the trend of the defined degree day values (bottom right).

## LIST OF DEGREE DAY DEFINITIONS

The list contains the configured standard values. Configuration is carried out by means of the symbols above the list.

**Key:**

- : **New**
- : **Edit**
- : **Delete**
- : Import
- : Show linked variables



| Option | Description |
|---|---|
| **Symbols** | Symbols for the configuration of the degree day definitions.<br>▸ Degree day definitions are created and edited with **New** and **Edit**.<br>▸ **Delete** removes the selected degree day definition after requesting confirmation.<br>▸ **Import** allows the import (on page 519) of degree day definitions from Deutschen Wetterdienst in *XLS,XLSX* and *XLSM* format. Actual<br>▸ With **Show linked variables** (on page 527), all variables linked to the degree day definition can be displayed. |
| **Visual name** | Unique name of the degree day definition. |
| **Description** | Description of the degree day definition. |
| **Temperature scale** | Temperature scale of the most-recent degree day value used. |
| **Inside temperature** | Inside temperature value. |
| **Heating temperature** | If the outside temperature is below this, the day is considered a heating day and the daily degree day is calculated. |

### CREATE AND EDIT DEGREE DAY DEFINITIONS

To create a new degree day definition:

1. Click on the **New** symbol.

   The dialog (on page 517) to configure a degree day definition is opened.
2. Please use an unique name.
3. Enter a description (optional).
4. Close the dialog by clicking on **OK**.
5. Configure the desired degree day values.

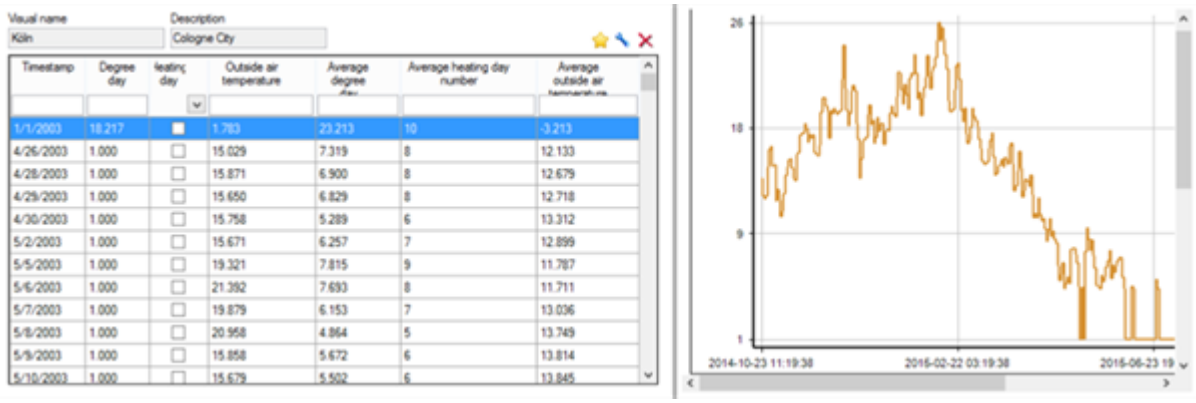
To edit a degree day definition, click on the **Edit** symbol. Change the desired options in the dialog.

## LIST OF DEGREE DAY VALUES

In the list of standard values, add the degree day values to the degree day definitions. They are displayed in the diagram next to the list.

**Key:**

- : New
- : Edit
- : Delete




| Option | Description |
|---|---|
| **Symbols** | Symbols for the configuration of the degree day values.<br>▸ Degree day values are created and edited with **New** and **Edit**.<br>▸ **Delete** removes the selected degree day value after requesting confirmation. |
| **Visual name** | Unique name of the degree day value. |
| **Description** | Description of the degree day value. |
| **Timestamp** | Date of validity of the degree day value. |
| **Degree day** | A number that denotes how much the heating was active on this day. |
| **Heating day** | Display of whether this day is a heating day. |
| **Outside air temperature** | Temperature of the outside air on this degree day. |
| **Average degree day** | Long-term average, for example 10 years, of the daily degree day for this day in the year. |
| **Average heating day number** | Denotes how often this day was a heating day in the long-term average. |
| **Daily average air temperature** | Average value of the air temperature on this day. |

## CREATE AND EDIT DEGREE DAY VALUE

To create a new degree day value:

1. Highlight the degree day definition for which the entry is to be created.
2. Click, in the list of degree day values, on the **New** symbol.

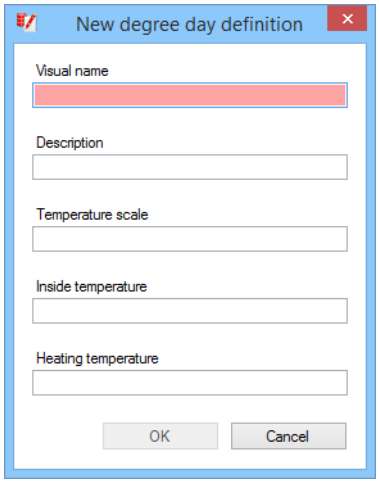
   The dialog (on page 518) to configure a degree day value is opened.
3. Configure the time stamp if necessary.
   This cannot be edited later.
4. Enter the value for daily degree day.
5. Configure other values (optional):
   - Current outside air temperature
   - Average degree day
   - Average heating day count
   - Daily average air temperature
   - Heating day
6. Close the dialog by clicking on **OK**.

**Note:** New values are only applied when saved to the degree day definitions.

To edit a standard value, click on the **Edit** symbol. Change the desired options in the dialog.

### 21.3.3.1 Degree day definition dialog

Clicking on the **New** or **Edit** symbol in the list of degree day definitions opens the dialog to add a new degree day definition:

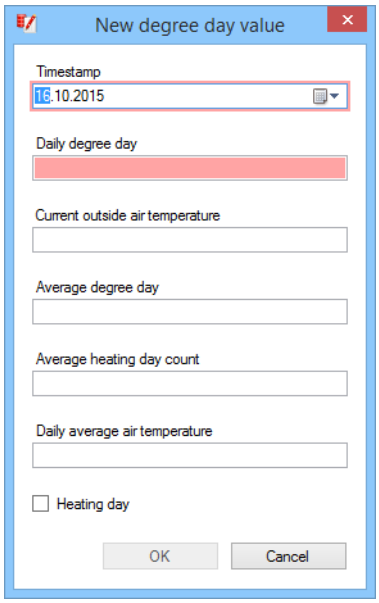



| Option | Description |
|---|---|
| **Visual name** | Unique name of the degree day definition. |
| **Description** | Optional description of the degree day definition. |

| Option | Description |
|---|---|
| **Temperature scale** | Indication of the scale used. |
| **Inside temperature** | Value of the inside temperature that is used for the calculation of the degree day number.<br>The temperature is shown precisely to 3 decimal places. The third place is rounded according to the other places. |
| **Heating temperature** | Indication of the temperature from which heating takes place.<br>The temperature is shown precisely to 3 decimal places. The third place is rounded according to the other places. |
| **OK** | Only active if all inputs are valid.<br>Clicking closes the dialog and adds the new degree day definition. |
| **Cancel** | Closes the dialog without generating a new degree day definition. |

## 21.3.3.2 Degree day value dialog

Clicking on the **New** or **Edit** symbol in the list of standard values opens the dialog to add a new degree day value:




| Option | Description |
|---|---|
| **Timestamp** | Entry of the time point from when the new degree day value is valid. This time can also be in the past. |

| Option | Description |
|---|---|
| | Input is in:<br>▸ **Date field**: Direct input without selection from a calendar. Clicking on the button opens the calendar.<br>A time point is only valid if it does not trigger a time stamp clash.<br>**Note:** Only available when creating from scratch. Cannot be edited later. |
| **Daily degree day** | Value calculated in accordance with the degree day. |
| **Current outside air temperature** | Indication of the current outside air temperature. |
| **Average degree day** | Average degree day value of the last 10 years.<br>Can remain empty. |
| **Average heating day count** | Indication of how often this day was a heating day in the last 10 years. |
| **Daily average air temperature** | Average air temperature of this day. |
| **Heating day** | ▸ *Active*: This day is evaluated as a heating day. |
| **OK** | Only active if all inputs are valid.<br>Clicking closes the dialog and adds the new degree day value to the list. |
| **Cancel** | Closes the dialog without generating a new degree day value. |

### DEGREE DAY FORMULA

The **degree day figure** is the sum of the differences of the stipulated room interior temperature and the respective average daily value of the outside temperature over all days of a time period when the outside temperature is below the heating limit temperature of the building.

## 21.3.3.3 Import degree day values

Degree day values can also be imported.

Clicking on the Import symbol in the toolbar of the degree day tag starts the import process.

The following can currently be imported:

- Degree day figures from Deutsche Wetterdienst in the *XLS*,*XLSX* and *XLSM* format.

To import data:

1. Click on the **Import** button.

   The operating system dialog for selecting a file is opened
2. Select the desired GTZ file.
3. Click on **Open**.

   The data is imported.

The import can be undone using the **Undo** command.

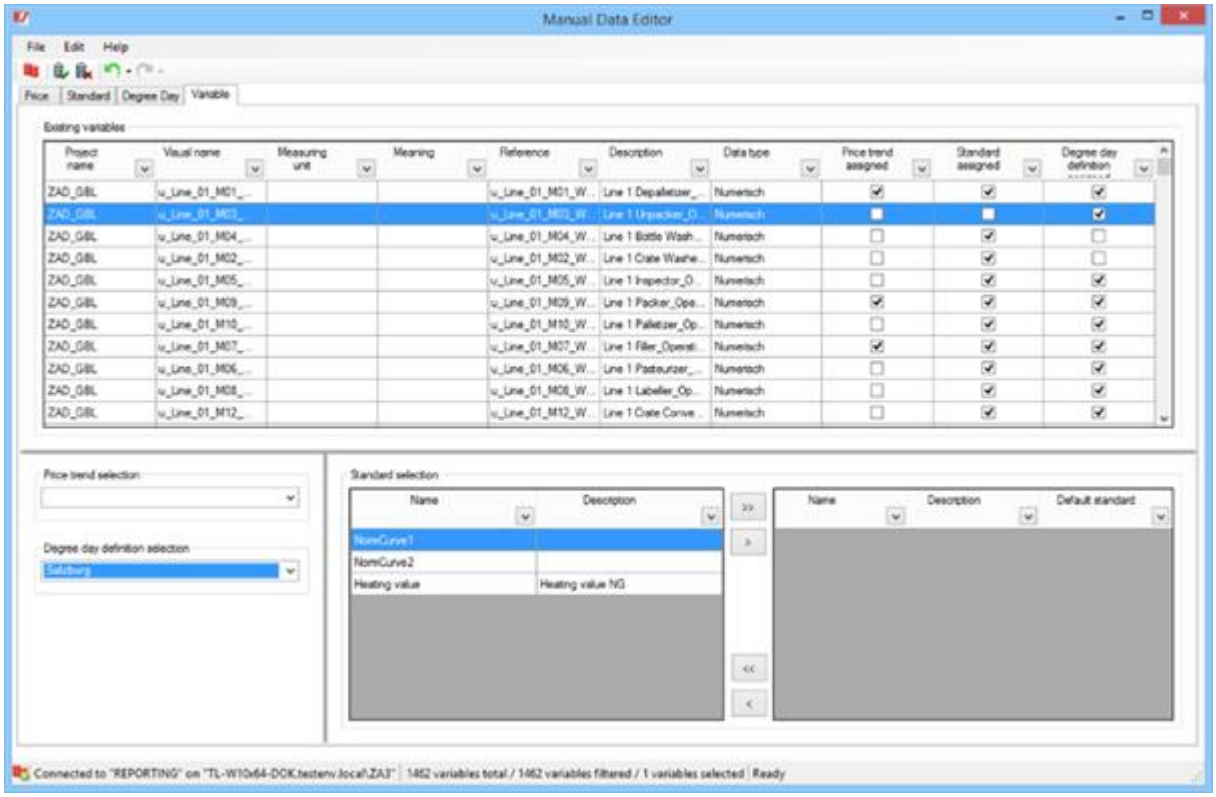
## 21.3.4Variable

In this tab, you link price trends, standards and degree day definitions to variables.

The following can be linked to each variable:

- A price curve
- A degree day definition
- Several standards
  Note: With several standards, one can be chosen as a default.

The tab is divided in three areas:



- Variable list: Display of the selectable variables and their current configuration (top).
- Selection of prices / degree days: Selection of a price curve and/or a degree day definition to link to a variable (bottom left).
- Selection of standards: Selection of one or more standards to link to a variable and to establish a **Default Standards** (bottom left).

To link a variable:

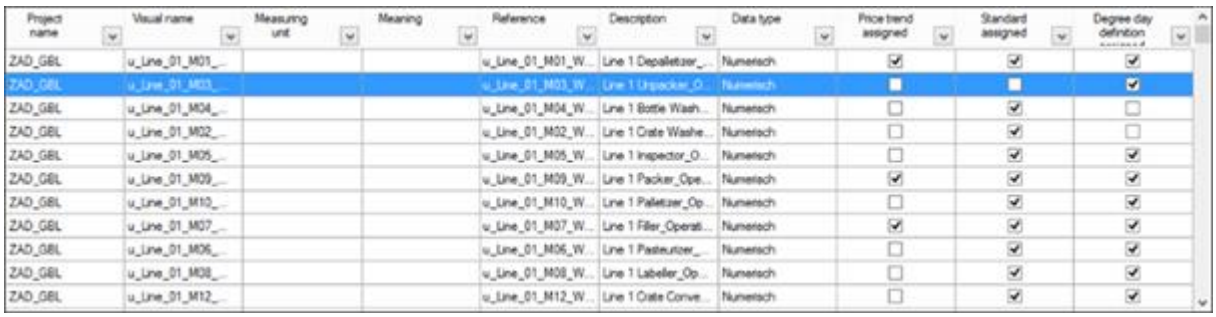
1. Select the desired variable
2. Select the elements to be linked.
   a) Price
   b) Degree day
   c) Standards
   Define a standard as a **Default** if required.

## VARIABLE LIST

The variables to be edited are listed in the variable list. These can be filtered (on page 524).

Several variables can be selected at the same time. In doing so, the usual Windows keyboard shortcuts can be used. When selecting several variables, in the configuration areas for price, degree day and standards, all fields that have a different configuration are highlighted in red.

If the table is repopulated by a change to the filter criteria, then an attempt is made to restore the previous selection of variables.




The list contains the following columns:

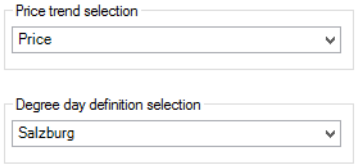
- **Project name**: Name of the project from which the variable comes.
- **Variable name** : Name of the variable.
- **Measuring unit**: Unit of measurement for variable values.
- **Meaning**: Several meanings of a variable are separated by line switchings.
- **Identification**: Name of the variables in zenon Editor and Runtime.
- **Description**: Description of the variables.

- **Data type**: Data type of the variable.

  **Attention:** Technically, prices, standards and degree days for binary and string variables can also be entered. However this normally does not make sense, because there are generally neither costs nor target consumptions for these variables.
- **Price trend assigned**: Display of whether a price trend has been linked.
- **Standard assigned**: Display of whether standards have been linked.
- **Degree day definition assigned**: Display of whether a degree day definition has been linked.

## SELECTION OF PRICE AND DEGREE DAY DEFINITION

In this area, you select the price trend and/or degree day definition for the highlighted variables:




| Option | Description |
|---|---|
| **Price trend selection** | Selection of a price curve from a drop-down list.<br>To remove an entry that has already been selected, select the empty entry in the drop-down list. |
| **Degree day definition selection** | Selection of a degree day definition from drop-down list.<br>To remove an entry that has already been selected, select the empty entry in the drop-down list. |

If several variables with existing different price curves or degree day definitions have been selected, the respective field is shown as empty with a red border.

## STANDARD SELECTION

There are two lists available for the selection and assignment of standards:

| Option | Description |
|---|---|
| **Selection of the standard** | Lists to link standards to variables. |
| **List of selection of standards** | Contains all standards that have not yet been selected. |
| **Symbols for linking** | Symbols to assign standards:<br>Buttons to drag standards between lists:<br>▸ >:<br>Moves highlighted standard to the **List of linked standards.**<br>▸ >>:<br>Moves all standards to the **List of linked standards.**<br>▸ <:<br>Moves highlighted standard to the **List of selection of standards.**<br>▸ <<:<br>Moves all standards to the **List of selection of standards.** |
| **List of linked standards** | Contains all standards that are already linked to the selected variables. |
| **Default Standard** | Selection of a standard as a **Default**.<br>Clicking in the checkbox selects the attendant standard as a **Default**.<br>It is always only one standard that can be selected as a **Default**. |

If several variables with existing different standards have been selected, the selection fields are shown with a red border; standards that are only available for some variables are highlighted in red font.

## 21.4 Actions

In the **Manual Data Editor**, data for prices, standards and degree days can be entered manually and variables can be assigned, as well as displayed in a historic diagram. The variables can be displayed as filtered.

### ACTIONS

Available actions:

- Data entry for:

- Price (on page 503) and trend diagram
- Standards (on page 507) and trend diagram
- Degree days and trend diagram

- Linking of variables (on page 520) to prices, standards and degree days
- Actions in the Editor:
  - Sorting and filtering
  - Apply changes
  - Undo - Restore
  - Show linked variables (on page 527)

## 21.4.1 Filtering and sorting

Tables in the Manual Data Editor can be displayed as sorted and filtered.

### SORT

To sort a table, click in the header of the column according to which the table is to be sorted. A second click inverts the sorting, for example from A - Z to Z - A.

### FILTER

To filter a table:

1. Click in the desired column in the field for filtering.
   Note: For filtering of a column with binary values (such as **heating day**), click on the **Arrow** symbol.
2. Enter the filter criterion.

   The table is amended to the criterion during entry.
   If the criterion is not correct and cannot be applied, the input field is highlighted in red.
3. Enter further filter criteria in further columns if required.

#### FILTER RULES

The following is applicable for filter settings:

- All active filters are always linked with a logical **AND**.
- The ***** and **%** characters can be used as wildcards for the text search.
  Both characters stand for a desired number of characters in the text. They can be used at the start of the word, in the word and at the end of the word. With all entries in the filter, a ***** is

automatically assumed at the end.
Example: **Pr*** finds **Preis** and **Price** but not **Par**.
Note: If a filter is active when a new entry is created and the new entry does not correspond to the filter rules, it is not shown.

- The following is applicable for numbers:
  - =: Values that correspond to the argument are found.
    This is standard behavior. = does not need to be placed in front.
    Example: *5* finds all lines that contain the number *5* exactly.
  - <: Values that are less than or equal to the argument are found.
    Example: *<5* finds all lines that contain values that are either less than *5* oder equal to *5*.
  - >: Values that are greater than or equal to the argument are found.
    Example: *>5* finds all lines that are either equal to *5* or greater than *5*.
- The following is applicable for dates: Values that correspond to the argument are found.

Incorrect entries are displayed with a red background color. Only the correct filter criteria are applied.

## 21.4.2 Apply changes

Changes are transferred to the database by means of the command or the **Apply changes** symbol and saved there. The transfer of changes is checked and confirmed once this has been carried out (**Commit**). If a change to a variable is not successful, the transaction is reversed (**Rollback**).

### Attention

If an error occurs when completing one of the transactions (**Rollback** or **Commit**), the database can become corrupted and thus unusable.

## 21.4.3 Undo - Restore

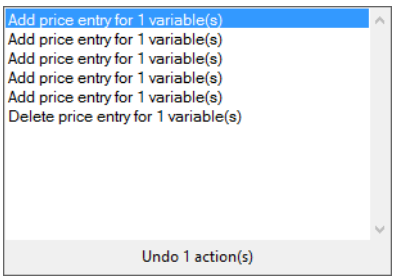
Actions in the Manual Data Editor can be undone or restored.
This action is possible for all configurations that have been set up since the last **check in**.

### UNDO

To undo actions:

1. Select the **Undo** command in the toolbar.
2. Clicking directly on the symbol undoes the last action.

3. Clicking on the button opens a window with the available actions:




4. Highlight the desired actions.

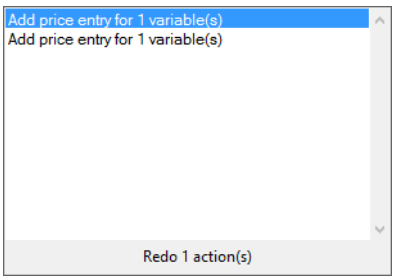
   Several interrelated actions from the top (last to be have been carried out) to the bottom.

5. The status line shows how many actions are being undone.
6. Clicking on the selected action undoes it.

## REDO

To restore actions:

1. Select the **Restore** command in the toolbar.
2. Clicking on the symbol directly restores the last action that has been undone.
3. Clicking on the button opens a window with the available actions that were undone:




4. Highlight the desired actions.

   Several interrelated actions from the top (last to be have been undone) to the bottom can be selected.

5. The status line shows how many actions have been restored.
6. Clicking on the selected action restores it.

> ### Information
>
> When executing the **Check in** and **Undo check out** commands, the lists for **Undo** and **Restore** are emptied. The **Undo** and **restore** functions are thus only available for actions that are executed after applying or rejecting.

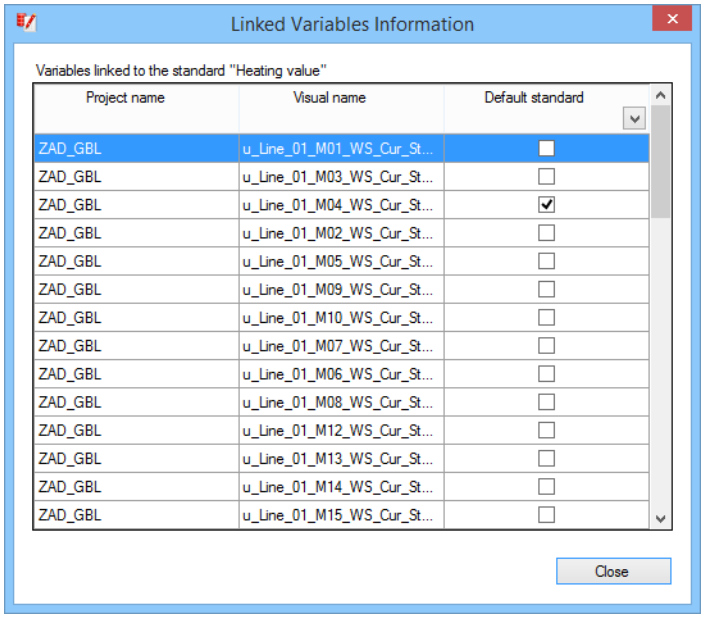
## 21.4.4Show linked variables

Variables that are linked to price curves, standards or degree day figures can be displayed in a dialog. To show linked variables:

1. Mark the desired element.
2. Click on the **Linked Variables** symbol.

   The dialog is opened.

### LINKED VARIABLES DIALOG




The list shows all variables linked to the selected element. The list can be filtered and sorted (on page 524).

The following are displayed:

- **Project name**: Name of the project from which the variable comes.
- **Visual name**: Name of the variable.
- **Default Standard**: Display of whether the variable is the Default standard. (only available for standards)

## 21.5 Settings

You configure the following in the settings:

- Number of connections to be saved.
- Connection profiles

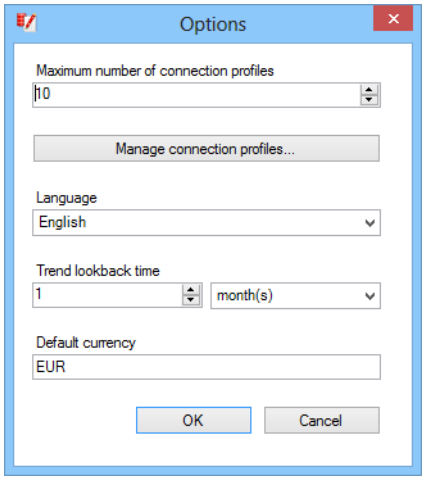
- User interface language,
- Lookback time for trend curves
- Default currency
- SQL Server timeout

To configure the settings:

1. Open the menu **File**
2. Select the command **Settings**.

   The dialog for configuring settings is opened

## SETTINGS DIALOG



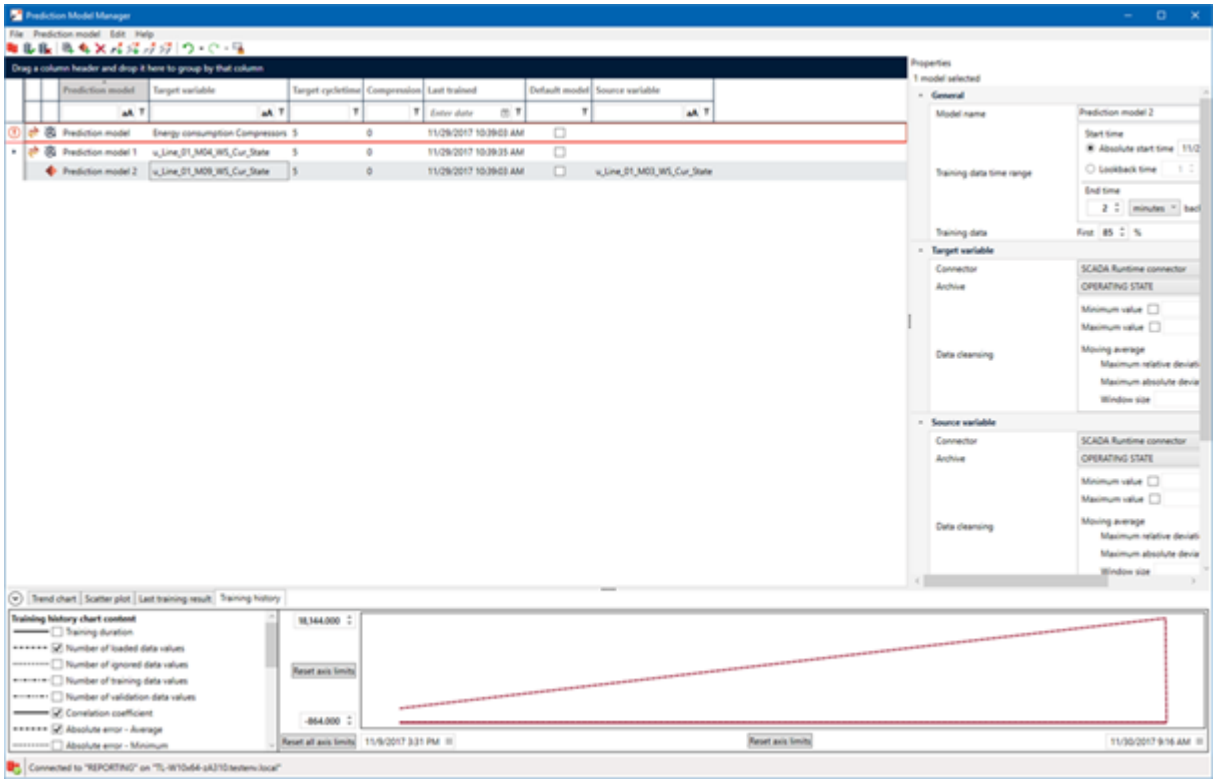

| Option | Description |
|---|---|
| **Maximum number of connection profiles** | Defines how many connection profiles can be created as a maximum for the Editor:<br>▸ Minimum: *1*<br>▸ Maximum: *255*<br>▸ Default: *10*<br>Configuration by manual entry or by clicking on arrows.<br>**Note:** Because the ZAMS connection profile can also be displayed in the dialog for establishing a connection (on page 496), more than the permitted amount of connection profiles can be displayed in the drop-down list to select a profile. |
| **Manage connection profiles** | Opens the dialog (on page 39) to manage the connection profiles. |

| Option | Description |
|---|---|
| **Language** | Selection of the desired language for the user interface of the Editor from a drop-down list. |
| **Trend look-back time** | Stipulates how far back in time the trend display of prices, standards and degree days goes. Entry is made by means of an input field and a drop-down list that define the time period.<br>**Entry of the numeric value:**<br>▸ Minimum: *1*<br>▸ Maximum: *100*<br>▸ Default: *1*<br>Configuration by manual entry or by clicking on arrows.<br>**Selection of the unit from drop-down list:**<br>▸ *Hours*<br>▸ *Days*<br>▸ *Months*<br>▸ *Years*<br>Default: *1 year*<br>If non-permitted values are entered manually, the default value of *1 year* is configured when the dialog is closed. |
| **Default currency** | Input of a character sequence for the standard currency. |
| **SQL Server statement timeout** | Entry of the SQL server statement timeout.<br>This timeout enters into force if an individual SQL Statement runs for longer than is defined here, for example when backing up or when restoring a large database. With new connections, the currently-set value is used for the Timeout. If this is amended in the options, the existing connections are amended to the new value.<br>The Timeout can be set to a value between *1* minute and *7* days.<br>**Input elements:**<br>▸ Number element:<br>Entry of the quantity in the field directly or by means of the arrow keys.<br>Possible values for : |

| Option | Description |
|---|---|
| | - days: *1 - 7*<br>- hours: *1 - 168*<br>- minutes: *1 - 10080*<br>▸ Drop-down list for granularity:<br>Possible values:<br>- minutes<br>- hours<br>- *days*<br>This selection influences the value range of the number element.<br>Default: *5 minutes* |
| **OK** | Applies settings and closes the dialog. |
| **Cancel** | Discards all changes and closes the dialog. |

# 22 Prediction Model Manager

Prediction models provide information on future values to be expected and on the interactive effects of variables. The **Prediction Model Manager** is for the setting and administration of prediction models. The results of the prediction models are used in **Predictive Analytics** reports.



The **Prediction Model Manager** is a separate application. This can be started for editing directly from ZAMS, from the start menu item or directly via the file. The **Prediction Model Manager** is not included in the standard zenon Analyzer license. It needs its own license.

## ZAMS

To open the **Prediction Model Manager** in ZAMS:

1. Navigate to the **Options** ribbon in ZAMS.
2. Select the entry **Prediction Model Manager**.
   Note: The entry is only shown if **Predictive Analytics** has been licensed.

   The **Prediction Model Manager** is started. At the same time, the dialog to establish a connection (on page 532) is opened.

## START MENU

Start from the start menu as a stand-alone application:

- In the Windows Start menu, select the **COPA-DATA -> Prediction Model Manager** entry. The **Prediction Model Manager** is started.

### COMMAND LINE:

If the **Prediction Model Manager** is started as an EXE file using the command line, a connection profile can be transferred.

- Parameter: **Server name\Database name**

### KEYBOARD SHORTCUTS

The following key combinations are available for use in the Editor:

| Key combination | Description |
|---|---|
| **F1** | Opens help |
| **Ctrl+Shift+C** | Opens the dialog for creating a database backup. |
| **Ctrl+S** | Saves changes. |
| **Alt+F4** | Closes the CD_PRODUCTNAME Editor |
| **Ctrl+Z** | Undo input |
| **Ctrl+Y** | Repeat input. |

# 23 Connect

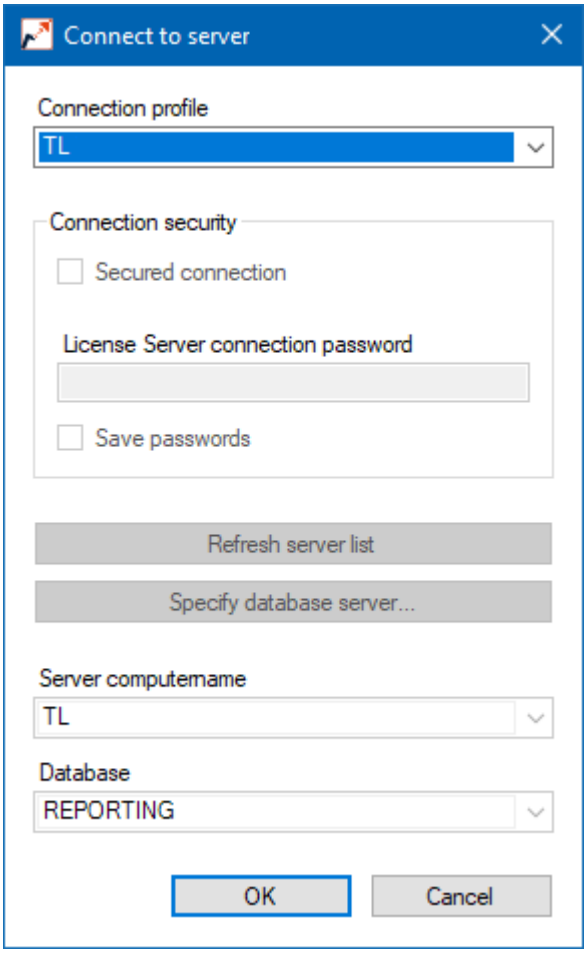
The **Prediction Model Manager** administers its connection profiles. The ZAMS connection profiles are also read on startup. If there are profiles in the **Prediction Model Manager** and in ZAMS profiles with the same names, the connection profile of the **Prediction Model Manager** dominates.

To connect the **Prediction Model Manager** to a database:

1. Start the **Prediction Model Manager** as a Stand alone Tool from the start menu or using the **EXE** file from the **Options** ribbon in ZAMS.
   If the **Prediction Model Manager** has already been opened, select the **Connection** entry in the **File** menu.

   The dialog to connect to a server is opened.

2. Select the desired connection by clicking on **Connection profile** or create a new connection (on page 75) in a similar manner to that of ZAMS.




3. Click on **OK**.

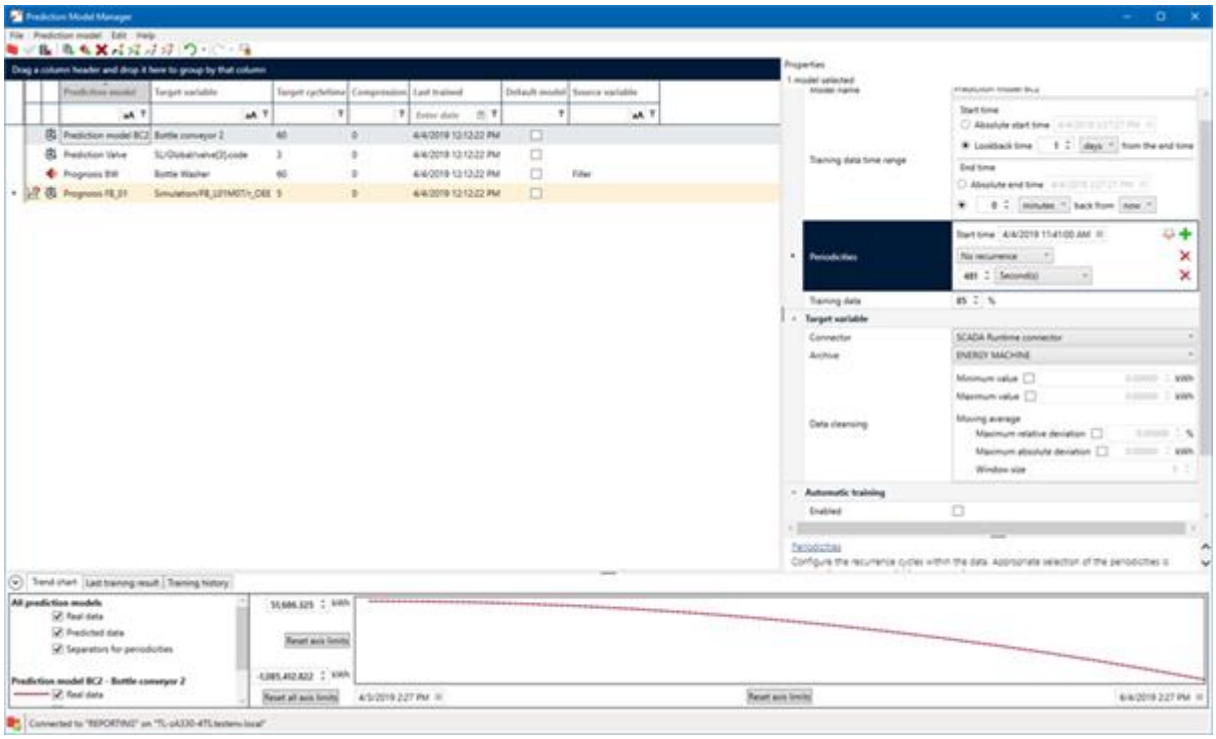
   - The connection is created.
   - The user authorization is queried by the license server
   - The database is checked to see that it is correct.
     Note: No connection is established if there are incorrect structures or versions.
     Conversion (on page 182) is only possible with ZAMS.
   - Data is loaded
   - The license is obtained.
     Errors when obtaining the license are shown in a pop-up.
   - The loaded data is displayed in the **Prediction Model Manager**.

# 24 Main window

The **Prediction Model Manager** is divided into:

- Menu (on page 536)
- Toolbar (on page 536)
- List (on page 540) of available prediction models
- Properties window (on page 576) with the properties for the models and embedded help
- Visualization window (on page 545) with visualizations and key figures of the models selected in the list
- Status bar (on page 536)

> **Information**
>
> All changes in **Prediction Model Manager** are only saved if the saving is triggered by the corresponding entry in the menu or the tool bar. Prediction models with unsaved changes are marked in the list with a corresponding symbol.



| Range | Description |
|---|---|
| **Menu bar** | Menus (on page 491) to edit and save the objects. |
| **Toolbar** | Symbols (on page 491) to edit and save the objects. |

| Range | Description |
|---|---|
| **Grouping line** | Allows the grouping (on page 544) of the prediction model according to certain criteria. |
| **List of prediction models** | List of all prediction models created.<br>Multiple selection for models is possible.<br>▸ **Ctrl key + mouse click**: Selection of the models that have been clicked on.<br>▸ **Shift key + mouse click**: All models between the originally-marked and the newly-marked are selected.<br>▸ Shortcut **Ctrl+A**: All models are selected. |
| **Properties** | Displays the properties (on page 576) of the selected models. |
| **Embedded Help** | Shows a brief halp text for the selected property and a link to the manual. |
| **Visualization window** | Visualizations and key figures of the models selected in the list |
| **Status line** | Display of status information (on page 491) on connection and actions. |

## COLUMNS OF THE LIST

The list of the prediction models contains columns with information about the models. The list can be sorted, filtered and grouped (on page 542) according to these columns.

| Column | Description |
|---|---|
| **Warnings** | Errors during processing are signaled with an exclamation mark. Details of the error are shown in a tool tip. |
| **Model status** | A symbol shows the status of the prediction model:<br>▸ Question mark:<br>The model must be retrained and contains unsaved changes. The complete line of the model is colored.<br>▸ Arrows:<br>This model contains unsaved changes.<br>▸ No symbol:<br>No changes present and no training necessary.<br>All symbols offer a tool tip with detailed information. |
| **Model type** | Type of prediction model: |

| Column | Description |
|---|---|
| | ▸ *time based*<br>▸ *value based* |
| **Prediction model** | Name of the prediction model. |
| **Target variable** | Target variable of the model. |
| **Target cycle time** | Cycle time of the target variables. |
| **Compression** | Aggregation of the target variables. |
| **Last trained** | Time of the last training of the model. |
| **Default model** | Display and configuration of whether the model is the default model for the target variable of the model.<br>▸ *Active*: Model is selected as default model for the target variable.<br>▸ *Inactive*: Model is not selected as default model for the target variable.<br>To change the setting, click in the prediction model and activate or deactivate the checkbox.<br>**Note:** Only one single combination of **target variable**, **target cycle time** and **aggregation** can be defined as the default model. If the checkbox, when ticked for a prediction model, has already been set for another prediction model of the same type, it is deactivated for this. Time-based and value-based prediction models are considered as separate in the process. |
| **Source variable** | Display depends on the type of prediction model:<br>▸ Value-based: Display of the source variables.<br>▸ time based: Empty. |

## 24.1 Menus, toolbar and status line

The menu and toolbar offer a range of commands to administer the **Prediction Model Manager**. The status bar informs you of connections.
The menu items and symbols that are available depend on the status of the database connection.

### 24.1.1 Menus

The menu line contains entries for the following groups:

- **File**
- **Prediction model**:
- **Edit**
- **Help**

#### FILE

Commands for general operations.

| Entry | Description |
|---|---|
| **Establish connection** | Opens the dialog (on page 532) to create a connection.<br>**Note:** If the dialog to create a connection is confirmed by clicking on **OK**, then a new attempt to establish a connection is made. If there is already a connection and there are unsaved changes, corresponding notices are displayed. |
| **Accept changes** | Saves all changes made to all prediction models in the database.<br>Only available if changes have been made, all models are trained and there are no validation errors. |
| **Discard Changes** | Discards all changes made since the last save after requesting confirmation. |
| **Settings** | Opens the dialog (on page 540) for the configuration of the settings for connection profiles, language and timeout of the SQL instruction. |
| **Close** | Closes the **Prediction Model Manager**. If there are still unsaved changes, you are asked if you want to save the changes. |

#### PREDICTION MODEL

Commands for the creation and administration of prediction models.

| Entry | Description |
|---|---|
| **Add time based models** | Opens the wizard to create a time-based model (on page 556). |

| Entry | Description |
|---|---|
| **Add value based models** | Opens the wizard to create a value-based model (on page 564). |
| **Delete selected models** | Deletes all selected models from the list. |
| **Load real data for selected models** | Loads the real data in relation to the connector for all selected models. |
| **Load real data for all models** | Loads the real data in relation to the connector for all models. |
| **Train selected models** | Starts the training for the selected models. |
| **Train all models** | Starts the training for all models. |

### EDIT

Commands for repeating and undoing actions.

| Entry | Description |
|---|---|
| **Undo** | Undoes the last action.<br>One step always relates to a user interaction such as editing a property, the deletion or insertion of models, or the training of models. |
| **Restore** | Restores the last undone action.<br>Only available if something has been undone beforehand. |
| **Clear cache** | Removes the loaded data from the cache (on page 576). |

### HELP

Help and version information.

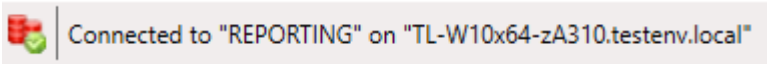
| Entry | Description |
|---|---|
| **Info about** | Opens a window with information on the current version. |
| **Help** | Opens online help. |

### 24.1.2 Tool Bar

| Symbol | Description |
|---|---|
| **Connect** | Opens the dialog (on page 496) to create a connection.<br><br>**Note:** If the dialog to create a connection is confirmed by clicking on **OK**, then a new attempt to establish a connection is made. Unsaved changes are then discarded without confirmation being requested. |
| **Save changes** | Saves all changes made. |
| **Discard changes** | Discards all changes made since the last save after requesting confirmation. |
| **Add time based prediction models** | Opens the wizard to create a time-based model (on page 556). |
| **Add value based prediction models** | Opens the wizard to create a value-based model (on page 564). |
| Delete | Deletes all selected models from the list. |
| **Load data for selected models** | Loads the real data about the connector for all selected models. |
| **Load data for all models** | Loads the real data about the connector for all models. |
| **Train selected models** | Starts the training for the selected models. |
| **Train all models** | Starts the training for all models. |
| **Undo** | Clicking on the symbol undoes the last action.<br><br>Clicking on the arrow of the drop-down list opens a window to select actions that are to be undone. Only the last chronological action or other subsequent actions can be undone as a block. |
| **Redo** | Clicking on the symbol restores the last undone action.<br><br>Clicking on the arrow of the drop-down list opens a window to select actions that have been undone that are to be restored. Only the last chronological action or other subsequent actions can be restored as a block. |
| **Clear cache** | Removes the loaded data from the cache (on page 576). |

### 24.1.3 Status line

There is a status line at the lower edge of the main window.




| Element | Description |
|---|---|
| **Symbol** | Shows the connection status.<br>The following are possible as a status:<br>▸ No connection established<br>▸ Connection established but the Analyzer server license is not valid<br>▸ Connection established and the Analyzer server license is valid<br>▸ Secured connection established, the license is valid<br>▸ Secured connection established, the license is invalid<br>Information about the status is shown using a tool tip. |
| **Connection information** | Information on the active connection. Display of the server and the database. |

## 24.2 Settings

In this dialog, you configure:

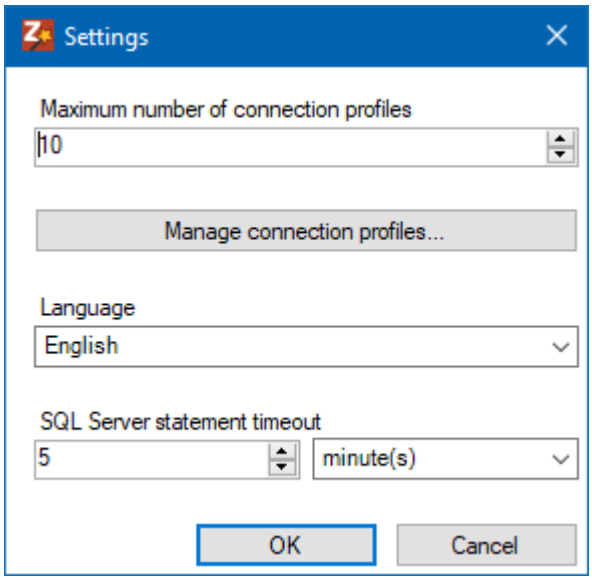
- The number of permitted connection profiles
- Administration of the connection profiles
- The language of the user interface of the Editor
- SQL Server statements timeout

To configure the settings:

1. Open the menu **File**
2. Select the command **Settings**.

   The dialog for configuring settings is opened

## SETTINGS DIALOG




| Option | Description |
|---|---|
| **Maximum number of connection profiles** | Defines how many connection profiles can be created as a maximum for the Editor:<br>▸ Minimum: *1*<br>▸ Maximum: *255*<br>▸ Default: *10*<br>Configuration by manual entry or by clicking on arrows.<br>**Note:** Because the ZAMS connection profile can also be displayed in the dialog for establishing a connection (on page 496), more than the permitted amount of connection profiles can be displayed in the drop-down list to select a profile. |
| **Manage connection profiles** | Opens the dialog (on page 39) to manage the connection profiles. |
| **Language** | Selection of the desired language for the user interface of the Editor from a drop-down list. |
| **SQL Server statement timeout** | Entry of the SQL server statement timeout.<br>This timeout enters into force if an individual SQL Statement runs for longer than is defined here, for example when backing up or when restoring a large database. With new connections, the currently-set value is used for the Timeout. If this is amended in the options, the existing connections are amended to the new value.<br>The Timeout can be set to a value between *1* minute and *7* days. |

| Option | Description |
|---|---|
| | **Input elements:**<br>▸ Number element:<br>Entry of the quantity in the field directly or by means of the arrow keys.<br>Possible values for :<br>- days: *1 - 7*<br>- hours: *1 - 168*<br>- minutes: *1 - 10080*<br>▸ Drop-down list for granularity:<br>Possible values:<br>- minutes<br>- hours<br>- *days*<br>This selection influences the value range of the number element.<br>Default:*5 minutes* |
| **OK** | Applies settings and closes the dialog. |
| **Cancel** | Discards all changes and closes the dialog. |

## 24.3 Group filter and sort lists

Lists can be sorted, filtered and grouped in the **Prediction Model Manager**.

### 24.3.1Sort list

To sort a list:

1. Click in the header of the column according to which sorting is to take place.
2. Click again to change the sorting.

   Three sorting processes are gone through in sequence:

   - *Ascending*: The list is sorted from *0 - 9* and from *a - z*.
     Display with arrow pointing upwards.
   - *Descending*: The list is sorted from *9 - 0* and from *z - a*
     Display by the arrow upwards.
   - *Unsorted*: The list is displayed in the original status, i.e. as it was created.

## 24.3.2 Filter list

To filter a list:

1. Click on the filter symbol in the filter line.

   The filter dialog is opened.

2. Configure the filter.
   The results of the selection are shown directly in the list.

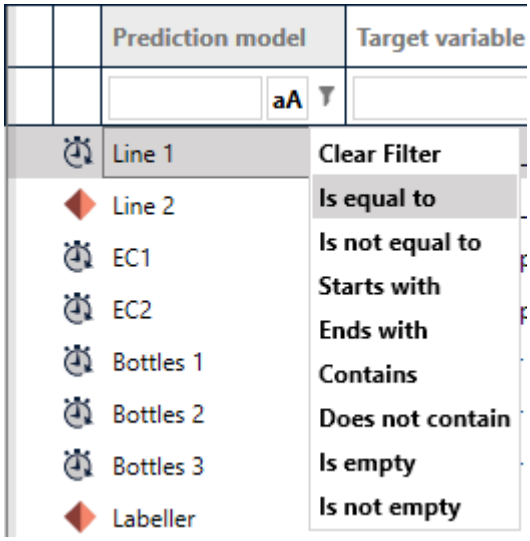
3. Click on the **Filter** button.

   The filter is applied to the list.

To remove the filter again:

1. Open the filter dialog.
2. Click on the **Remove filter** button.

### FILTER DIALOG




| Option | Description |
|---|---|
| **Input field** | Entry of the character sequence that is to be filtered for. |
| **aA** | Switches between:<br>▸ *Capitalization is not taken into account*<br>▸ *Capitalization is taken into account*<br>Default: *Capitalization is not taken into account* |
| **Symbol filter** | Clicking on the filter symbol opens a list to select a filter criterion. |

| Option | Description |
|---|---|
| | Default: *Contains* |

### FILTER CRITERIA

The following are available as criteria for filter expressions:

| Criterion | Description |
|---|---|
| *Remove filter* | Removes all filter criteria. All lines are displayed again. |
| *Is the same as* | All entries with precisely the character sequence entered are displayed. |
| *Is not the same as* | All entries that do not precisely correspond to the character sequence entered are displayed. |
| *Starts with* | All entries that start with the character sequence are displayed. |
| *Ends with* | All entries that end with the character sequence are displayed. |
| *Contains* | All entries that contain this character sequence are displayed. (Default setting.) |
| *Does not contain* | All entries that do not contain this character sequence are displayed. |
| *is empty* | All empty entries are displayed.<br>**Note:** Language tables must not contain empty cells for existing key words. |
| *is not empty* | All entries that contain at least one character are displayed. Spaces are also considered characters. |

## 24.3.3 Group list

To group a list:

1. Click on the header of the column according to which the list is to be grouped.
2. Drag the header of the column to the grouping line, with the mouse.

   The list is shown accordingly grouped:
3. Add further grouping columns if required.

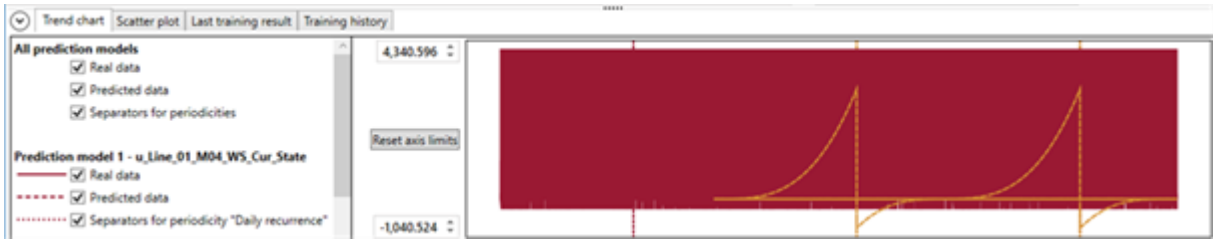
To remove the grouping:

1. Move the mouse over the grouping element in the grouping column.
2. Click on the **X** next to the column names.

   The grouping is removed.

# 25 Visualization window

The prediction models are visualized using several diagrams.




These diagrams are also used in the wizards to create the prediction models.

The following are available:

- **Trend diagram** (on page 547) (not for value-based prediction models)
- **Scatter plot** (on page 548) (not for time-based prediction models)
- **Last training result** (on page 549)
- **Training history** (on page 553) (not for wizards)

All diagrams support multiple selection of models. In this case, the data of all selected models is shown at the same time. Individual prediction models and indicators can be selected in the diagram.

## GENERAL DISPLAY

### PERIODICITIES

The display can be classified by the definition of periodicities. Each periodicity is represented by a checkbox and can be activated or deactivated. If a periodicity is set to *No recurrence* using the **Periodicities** property, it is also no longer offered as a checkbox for the separator lines.

### DRAW PREDICTED VALUES

Predicted values are always drawn in the future.
The following is applicable in the process:

- Trend: The minimum value of the X-axis is derived from the start time for the prediction model.
- Trend: The longest period in the future * 2 is always drawn.
  If the **Periodicities** is set to *no recurrence* or no periodicity has been activated, drawing is always for 2 months into the future.
- Value-based models: 1.25 times the maximum value (real-time data) for **X** into the future is drawn.

> **Example**
>
> Defaults:
>
> - Current time: 04-06-2019; 09:58
> - Longest period: 1 week
>
> Result:
>
> - The predicted values are drawn 2 weeks into the future, i.e. up to April 20, 2019; 09:58.

### ZOOM

It is possible to zoom as much as desired in diagrams with a mouse gesture. Exception: If the size of the zoom area is reduced to *0* due to the limited calculation precision, there is no further zooming and the previous zoom step is retained.

**Zooming:**

- To zoom: Drag a zoom square with the mouse.
  Zooming into the area is carried out when the mouse button is released.
- To leave the zoom range. Click on the **Reset All Axis Limits** button or one of the two **Reset Axis Limit** buttons for the respective axis.

### UPDATING THE DIAGRAMS

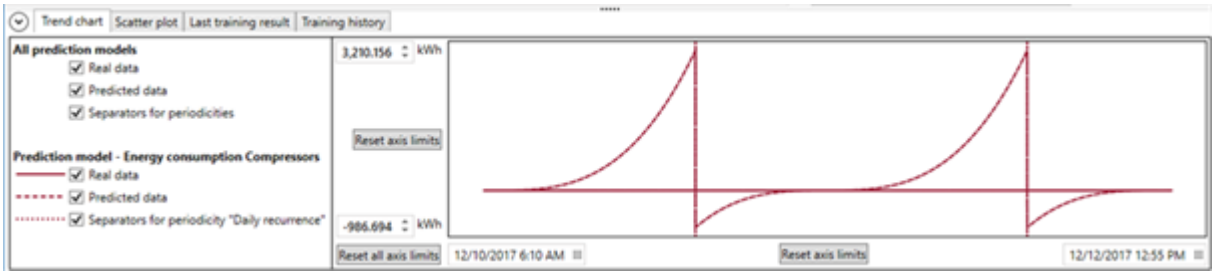
The diagrams are only redrawn if one of the following properties is changed:

- **Periodicities**
- **Data cleansing**

All other properties do not trigger redrawing.

## 25.1 Trend chart

The trend diagram contrasts the prediction model with the real data. It is only available for time-based prediction models.

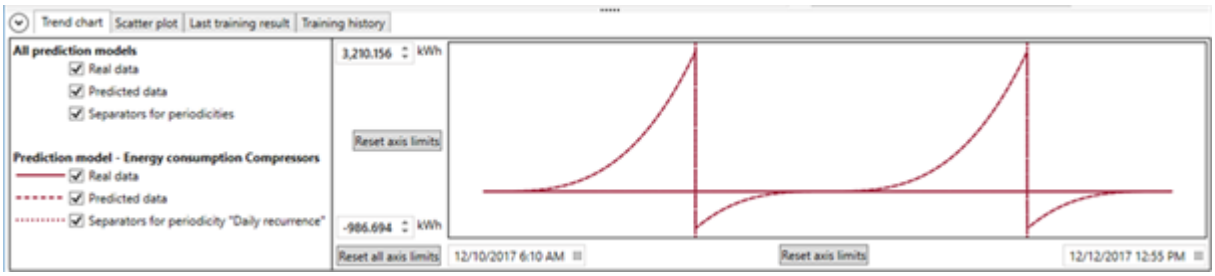



| Section: | Description |
|---|---|
| **Left block** | Selection of the data to be displayed.<br>Selection is made by means of checkboxes:<br>▸ **Real data**: Display of the real data.<br>▸ **Predicted data**: Display of the prediction data.<br>▸ **Separators for periodicities**: Separators for periodicity.<br>If fewer than 100 separators are to be drawn, the checkboxes for the periodicities are activated by default. With more than 100 separators, the checkboxes are deactivated and the separators are not displayed.<br>These settings can be used together for all selected models or individually for each selected prediction model. |
| **Right block** | Display of the selected data as a trend diagram.<br>The section shown is stipulated using:<br>▸ Vertical:<br>Entry of the lower and upper values for display in numerical input fields. Values can also be amended using arrow keys.<br>The upper value must be greater than the lower value.<br>▸ Horizontal:<br>Selection of the time points for the start and end of the area displayed using calendar element.<br>All values can be reset to the respective initial value. There are three buttons available for this:<br>▸ **Reset axis limits** (vertical):<br>Resets the values for the Y-axis.<br>▸ **Reset axis limits** (horizontal): |

| Section: | Description |
|---|---|
| | Resets the values for the X-axis.<br>▸ **Reset all axis limits**:<br>Resets the values both axes.<br>**Note:** For variable with cycle time *0* (event-triggered variables), there is no data available for which time period data points are to be created. It is therefore shown set at 500 points. |

## 25.2 Scatter Plot

The scatter plot contrasts the prediction model with the real data. It is only available for value-based prediction models.

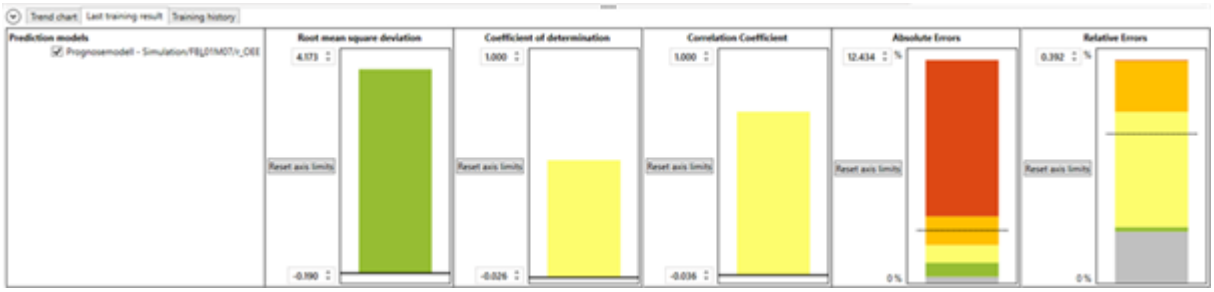



| Section: | Description |
|---|---|
| **Left block** | Selection of the data to be displayed.<br>Selection is made by means of checkboxes:<br>▸ **Real data**: Display of the real data.<br>▸ **Predicted data**: Display of the prediction data.<br>These settings can be used together for all selected models or individually for each selected prediction model. |
| **Right block** | Display of the selected data as a scatter plot.<br>The section shown is stipulated using:<br>▸ Vertical:<br>Entry of the lower and upper values for display in numerical input fields. Values can also be amended using arrow keys.<br>The upper value must be greater than the lower value.<br>▸ Horizontal:<br>Selection of the time points for the start and end of the area displayed using calendar element. |

| Section: | Description |
|---|---|
| | All values can be reset to the respective initial value. These buttons are available for this:<br>▸ **Reset axis limits** (vertical):<br>Resets the values for the Y-axis.<br>▸ **Reset axis limits** (horizontal):<br>Resets the values for the X-axis.<br>▸ **Reset all axis limits**:<br>Resets the values both axes. |

## 25.3 Last Training result

The display of the last training result makes it possible to consider the precision of a model and to compare several models to one another.




| Section: | Description |
|---|---|
| **Left block** | Selection of the models to be displayed. |
| **Right block** | Display of the key figures of the model training:<br>▸ **Root mean squared deviation**:<br>Denotes the amount by which the result is scattered from the value to be estimated.<br>▸ **Coefficient of determination**:<br>Key figure to evaluate how well the estimated values for the trend line correspond to their actual data.<br>▸ **Correlation coefficient**:<br>Indicates how well the model corresponds to the validation data<br>▸ **Absolute Errors**:<br>Shows the validation of the absolute errors of the model in the training area. |

| Section: | Description |
|---|---|
| | ▸ **Relative Errors**:<br>Shows the size of the relative deviation of the model data points in comparison to the validation data.<br><br>If several models are shown, the display is in accordance with the sequence in the **left block**.<br><br>The section shown is stipulated using:<br><br>▸ Correlation coefficient (vertical):<br>Entry of the lower and upper values for display in numerical input fields. Values can also be amended using arrow keys.<br>The upper value must be greater than the lower value.<br><br>▸ Error: Entry of the upper value for display in numerical input windows. Values can also be amended using arrow keys. The upper value must be greater than the lower value.<br><br>▸ All values can be reset to the respective initial value. To do this, there is this button available for each:<br><br>▸ **Reset axis limits**: resets the values for the Y axis.<br><br>You can read details on the key figures in the **Key figures** chapter. |

## KEY FIGURES

### ROOT MEAN SQUARED DEVIATION

The root mean squared deviations denotes the amount by which the result is scattered from the value to be estimated and helps to normalize the situation.

### COEFFICIENT OF DETERMINATION

The coefficient of determination is a key figure to evaluate how well the estimated values for the trend line correspond to their actual data. It is based on the analysis of variance. In doing so, the complete variation of the dependent variables in the variation and in the variation of the residues is analyzed. Value range: between *0* and *1*, whereby *1* is most reliable.

### CORRELATION COEFFICIENT

The correlation coefficient indicates how well the model corresponds to the validation data.

Possible values:

- Minimum: *0*.
  No match.
- Maximum: *1*.
  Perfect match.

The closer the value is to *1*, the more the model corresponds to the data.
The color of the bar changes with the value of the correlation coefficients of *0* to *1* from red through orange and yellow to green.

**Note:** In theory, all values are also possible under *0* to *-1* (completely inverse model). In practice, a value above *0* is always achieved by adjustment of the model to the data.

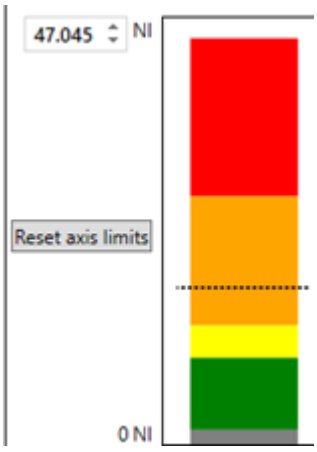
### ABSOLUTE ERROR

The data predicted by the model is compared absolutely to the validation data.
The absolute error shows the distribution of the absolute error of the model in the training area and thus how strongly the model differs from the training data.

- The bar in the diagram displays the distribution of the error with four colors along the same lines as a histogram:
- Upper edge: Maximum deviation of the model over all data points of the training data.
- Dashed line: Value of average absolute error.
- Color areas: 4 quarters, displayed with 4 colors.
- Grey bar at the lower edge: Area from *0* up to minimum error.
  The model always has at least one error with this value.

**Note:** Absolute error for models of variables with different units, sizes, etc. to compare, does not provide any meaningful results because the values have no relation to one another.

**Example:**




- Two quartiles (red, orange), with the largest deviation, scatter over a large area.

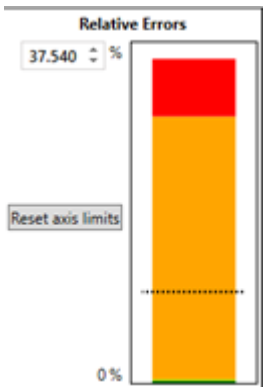
- Two quartiles (yellow, green), with the smaller deviation, scatter over a smaller area.
- In figures:
  - The model differs, considered over all data points of the validation data, by a maximum of 44 NI.
  - 25% of the data points have a deviation between 44 and 27 NI.
  - 25% have a deviation between 27 and 13 NI.
  - 25% have a deviation between 13 and 9 NI.
  - 25% have a deviation less than 9 NI.
  - The lowest error is 3.
    This means: This model always had an error of 3 NI.
  - On average, a data point deviates from the validation data by 17 NI in this model

### RELATIVE ERROR

The data predicted by the model is compared relatively to the validation data.
The relative error compares the data predicted by the model to the validation data. It indicates how much the deviation of the data points of the model differ relatively from the validation data, i.e. per data point in relation to a validation value.

Display is similar to the **absolute error**.

**Example:**



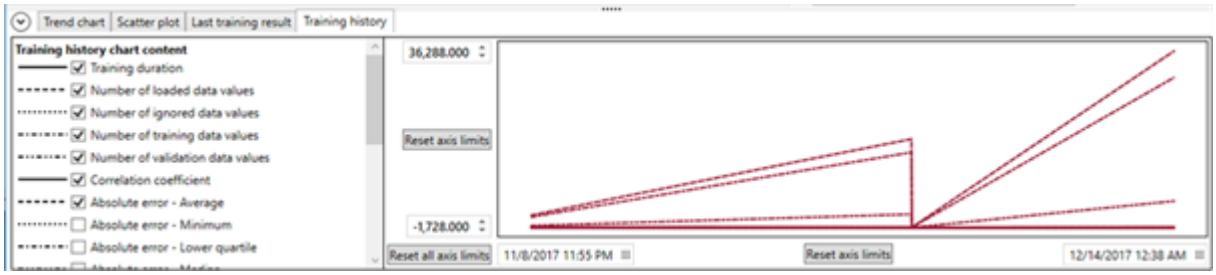

- The model calculates the value *15*.
- Validation data has the value *10* at this point.
- The absolute deviation is thus *5*.
- The relative deviation is thus *5/10 = 50 %*.

This also shows that the relative error is to be used with caution. A variable with the same absolute deviation of *5*, but with the value *100* at this point, would result in a relative deviation of just *5 %* . Variables that (even if only for a short time) move close to the value *0* are particularly problematic. A

single value vary close to *0* can lead to the maximum relative deviation talking on exotic values, for example: A value of *0.01* with an absolute deviation of *5* results in a relative deviation of *50.000 %*.

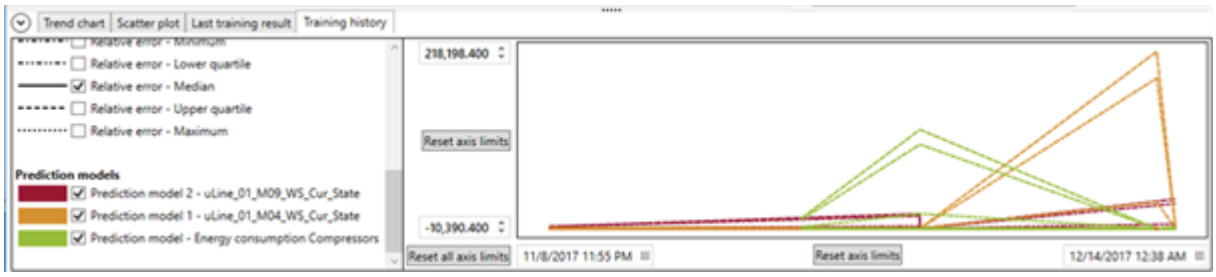
## 25.4 Training history

The diagram for the training history shows the course of the previous training. The amounts of data, duration of training and quality indicators of the model are shown over time. This makes it possible to establish how the model changes over time.




| Section: | Description |
|---|---|
| **Left block** | Selection of the diagram content and the prediction models.<br><br>The diagram content to be displayed is selected in the upper area. This is applicable for all prediction models displayed.<br>The selection of the prediction models that are displayed is shown in the lower area. |
| **Right block** | The section shown is stipulated using:<br><br>▸ Vertical:<br>Entry of the lower and upper values for display in numerical input fields. Values can also be amended using arrow keys.<br>The upper value must be greater than the lower value.<br><br>▸ Horizontal:<br>Selection of the time points for the start and end of the area displayed using calendar element.<br><br>All values can be rest to the respective initial value. There are three buttons available for this:<br><br>▸ **Reset axis limits** (vertical):<br>Resets the values for the Y-axis.<br><br>▸ **Reset axis limits** (horizontal):<br>Resets the values for the X-axis.<br><br>▸ **Reset all axis limits**:<br>Resets the values both axes. |

**Multiple selection:**

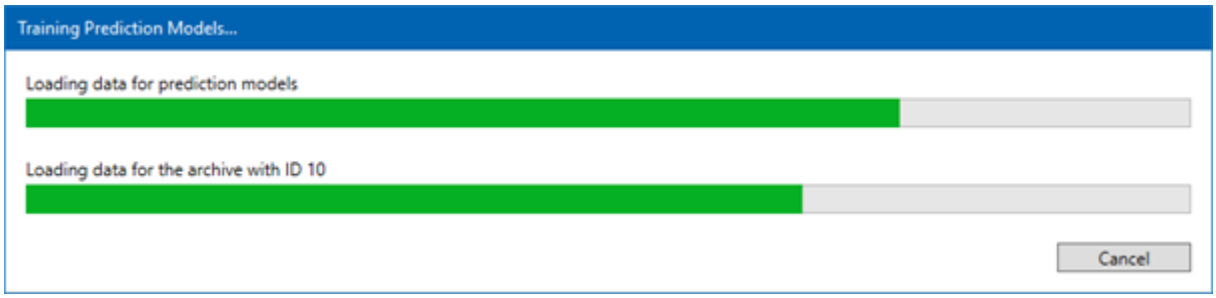



# 26 Configuration

The configuration of prediction models is carried out using the corresponding wizards (on page 555) and the properties (on page 576) of the prediction model.

## PROGRESS BAR

A progress bar is displayed if processes last longer.




For example, when getting the real data, training a model or preparing data for a diagram. The progress bar can be canceled. The complete process is thus canceled. The cancellation can only be carried out for certain tasks, such as getting data from the Runtime connector, once this task has been ended.

## UNIQUE ADDRESSING OF VARIABLE DATA

Data from the same variable but with a different cycle time or aggregation is not the same data and is considered different.
Unique addressing of variable data is ensured in the **Prediction Model Manager** by a combination of:

- **Variable name**
- **Cycle time**
- **Aggregation**

Archives can be used for addressing, but do not serve as a differentiation criterion.

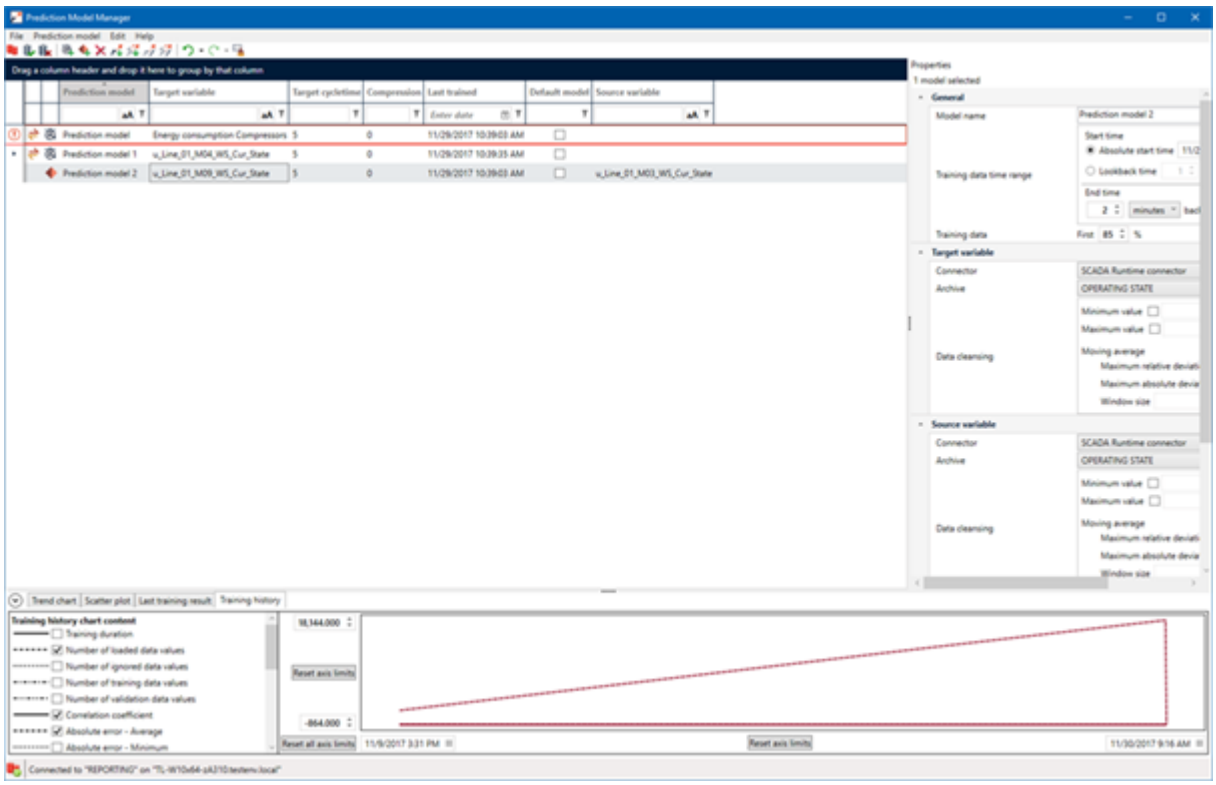
# 27Prediction models

Prediction models are created with the help of wizards and edited with the properties in the **Prediction Model Manager**.

Prediction models are based on two different types:

- Time based prediction models (on page 556): Have a time dimension and a target variable.
- Value based prediction models (on page 564): Have, instead of the time dimension, an explicit source variable and a target variable.

Changes to prediction models only become effective once they have been saved. To do this, no validation errors can be present and the models must be trained. Status and required actions are displayed (on page 534) using symbols.



## CREATE PREDICTION MODEL

The creation of prediction models is only possible using the respective wizard. This is started using the tool bar or the **prediction model** menu.

To create a prediction model:

1. Start the appropriate wizard for a time-based (on page 556) or value-based (on page 564) prediction model.
2. Configure the prediction model according to the process.

3. Save the new prediction model.

### EDIT PREDICTION MODEL

Prediction models can be edited in the **Prediction Model Manager**.

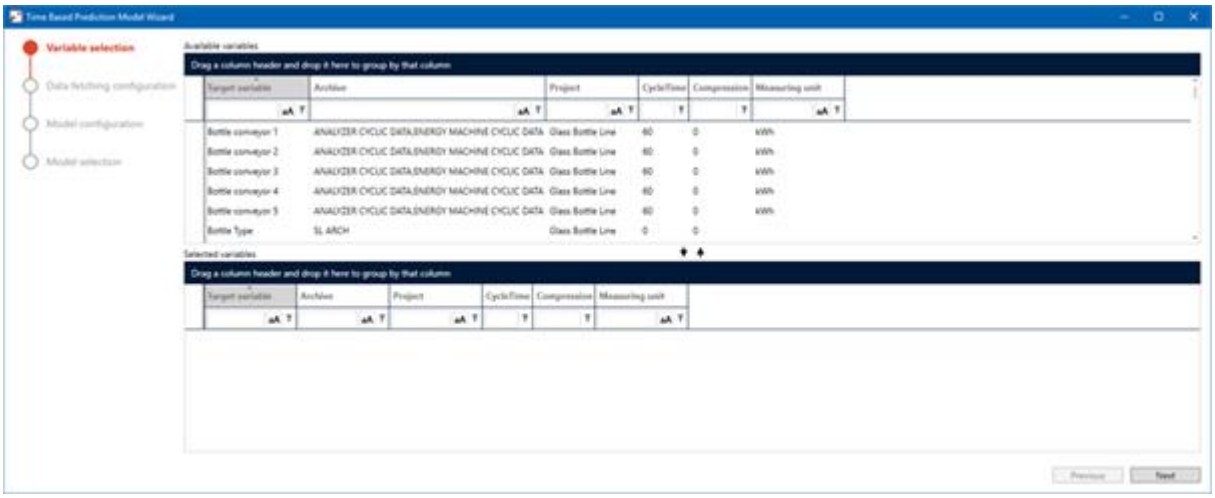
To edit a prediction model:

1. Select the model in the list.
   Several models can be selected and edited at the same time. Each change then has an effect on all models.
2. Edit the model using the properties.
3. Retrain the model.
4. Save the changes.

## 27.1 Create time-based prediction model

To create a time-based prediction model:

1. Start the wizard for time-based prediction models.
   To do this, select the corresponding entry in the **prediction model** menu or in the tool bar.
   The wizard is started.




2. The first step is to select the desired variables (on page 557).
3. Click on **Next**.
4. Configure the data call (on page 558).
5. Click on **Next**.

   The data for the prediction model is loaded.
6. Configure the model (on page 560).

7. Click on **Next**.
8. Select, if necessary, the models (on page 562) that are to be created.
9. Click on **Close**.

   The prediction models are created and shown in the **Prediction Model Manager**.

## NAVIGATION

Navigation through the wizard is with buttons in the lower right area:

- **Previous**: Returns to the previous step. This step back can be made at any point in the wizard.
  When going back, configured data is sometimes retained, if possible.
- **Next**: Goes to next step.
  If there is a validation error, navigation is prevented until the error has been rectified.
  Not present on the last page of the wizard.
- **Exit**: Creates the prediction model and closes the wizard.
  Only present on the last page of the wizard.

The progress of the configuration is shown by the vertical progress display on the left edge.
To cancel the wizard, close it by clicking on the X button on the top right. In this case, all entries are discarded and the prediction model is not created.

## 27.1.1 Variable selection

In this step, you select the variables for which the prediction model is to be created.

To select variables:

1. Highlight the desired variables in the list of **available variables**.
   Multiple selection is possible with **Ctrl key** + mouse click or **Enter key** + mouse click.
2. Click on the down arrow between the two lists.

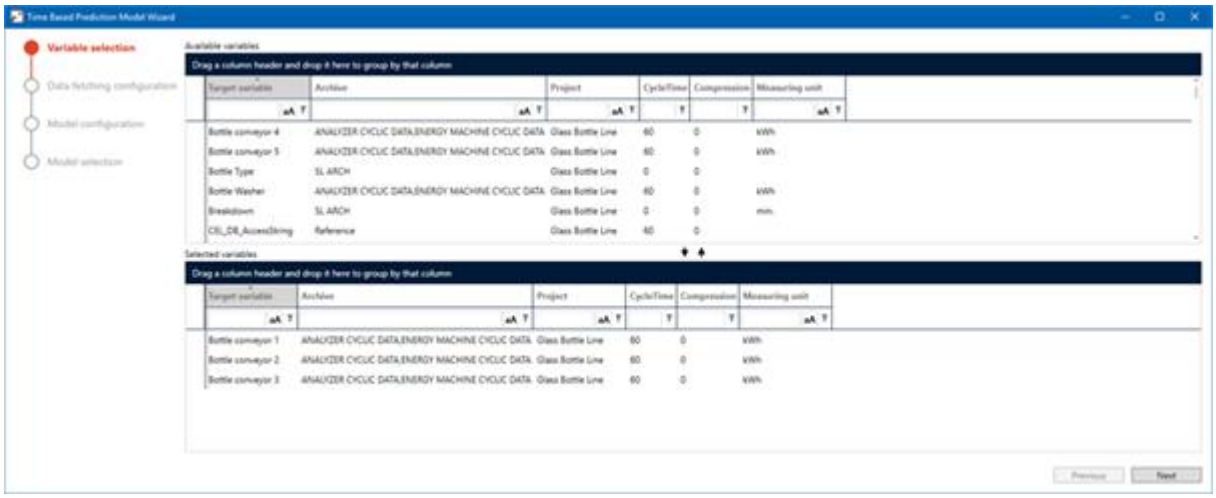
   The selected variables are added to the list of **selected variables**.
   Individual variables can also be added with a double click.

   There is a line each for a unique combination of variable, cycle time and aggregation displayed. If this combination is present in several archives, they are shown separated by a comma in the **Archives** column.

   To remove variables from the list again:

   - Double-click on the variable.
   - Or: Highlight the variable and click on the up arrow.
3. Click on the **Next** button.

The wizard checks the input and switches to the next step.



| Option | Description |
|---|---|
| **Variable selection** | Display of the active step in the wizard. |
| **Available variables** | List of available variables. |
| **Arrow keys** | Move selected variables from one list to the other.<br>Variables can also be moved by double clicking. |
| **Selected variables** | List of selected variables. |

### NAVIGATION

| Option | Description |
|---|---|
| **Previous** | Not available in the first step. |
| **Next** | Switches further to the **configuration of data call** step. |

## 27.1.2 Data fetching configuration

In the second step, you configure the settings for the fetching of data that are needed for the training of the models.

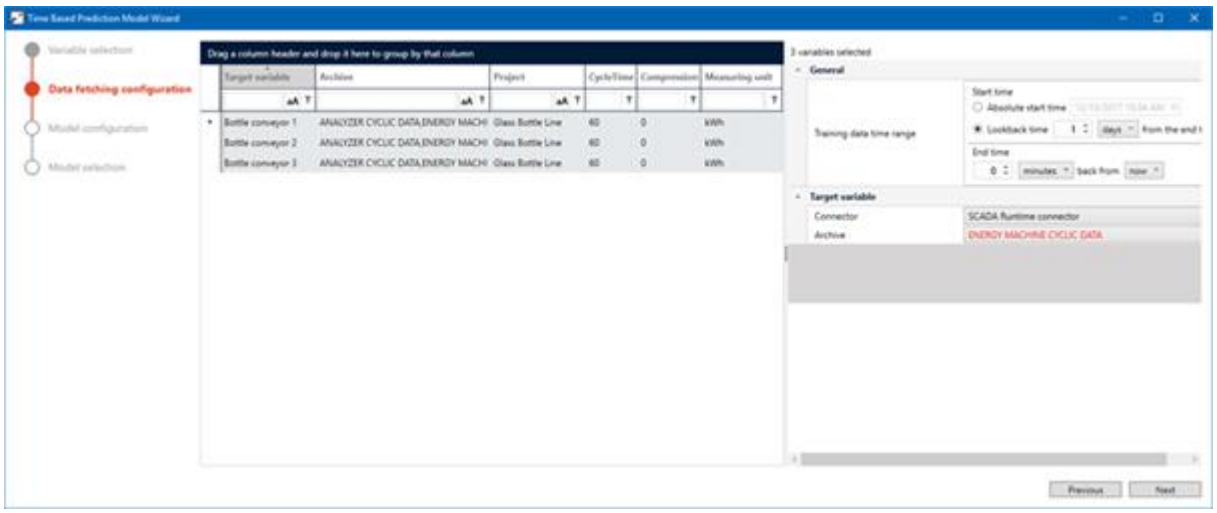
To configure the data call:

1. Highlight the desired variables in the list of **available variables**..
2. Select the desired properties in the **properties window** and amend their values.

You can configure several variables together. Properties with different settings are highlighted in red. All changes to properties are applied to all variables together

3. Click on the **Next** button.

   The wizard checks the input and switches to the next step.



| Option | Description |
|---|---|
| **Data fetching configuration** | Display of the active step in the wizard. |
| **Variable window** | Display of the variables selected in the first step. |
| **Properties window** | Properties for the configuration of the data call:<br>▸ **Training data time range**: Selection of the time period for the training. For details, see the **General** (on page 577) properties.<br>▸ **Connector**: Selection of the connector from the drop-down list.<br>▸ **Archives**: Selection of the archive from a drop-down list. For details, see the properties of the **target variable** (on page 583). |

## NAVIGATION

| Option | Description |
|---|---|
| **Previous** | Switches back to the **variable selection** step. |
| **Next** | Validates the input, gets the data for the variables for the set time period from the set data sources and carries out an automatic periodicity detection (on page 579). |

| Option | Description |
|---|---|
| | The current step remains open in the event of validation errors. You do not proceed further.<br><br>When validation is successful, you go on to the **model configuration** step. |

### ERROR HANDLING

If an error occurs during validation, the wizard does not move to the next step. An error message is shown above the list. The incorrect variables are marked and given an error notice. It is possible to move on once the error has been rectified.

Hint: A frequently-occurring error when getting data is that there are several data points for exactly the same time stamp. A corresponding error message for the first of the time stamps concerned is shown; all time stamps are shown with duplicated values in the LOG file.

## 27.1.3 Model configuration

In the third step, you create and configure prediction models for the selected variables.

To create and configure prediction models:

1. Highlight the desired variables in the list of **available variables**.

   There is already a prediction model for each variable.

2. Add further prediction models if required.
   To do this, click on the green **+** symbol.
   Prediction models can be added for all variables or for individual variables. If several variables are to be configured together, they must have the same prediction model.
   To remove a prediction model again, highlight the prediction model and click on the red **X**.
   There must always be a prediction model.

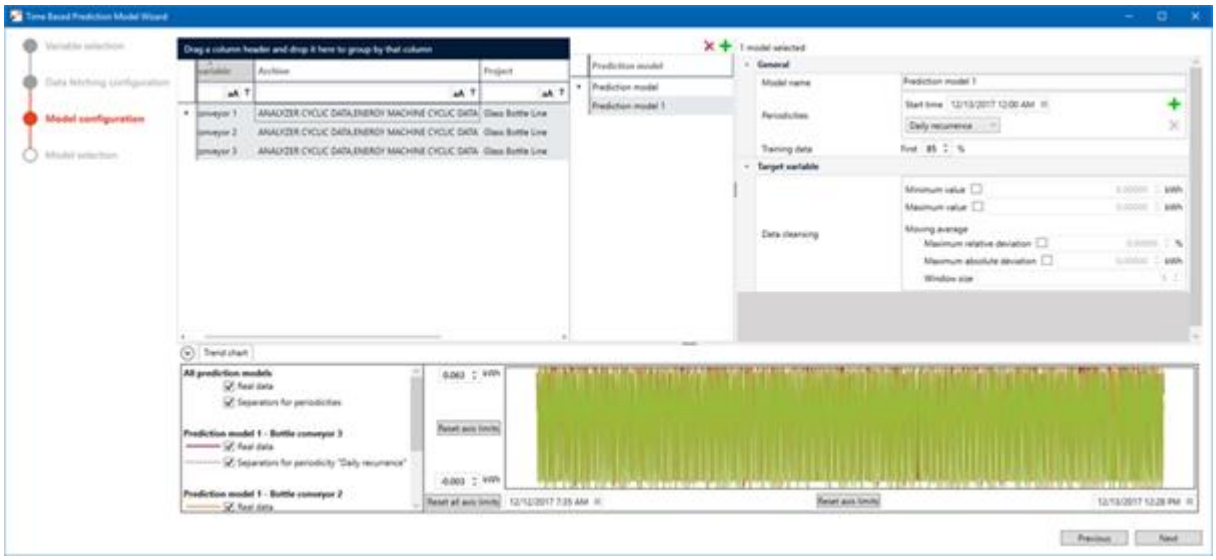
3. Select the desired properties in the **properties window** and amend their values.

   You can configure several variables and prediction models together. Properties with different settings are highlighted in red. All changes to properties are applied to all variables and prediction models together

   The trend diagram for the selected models is shown in the visualization window.

4. Click on the **Next** button.

The wizard checks the input and switches to the next step.



| Option | Description |
|---|---|
| **Configuration of model configuration** | Display of the active step in the wizard. |
| **Variables window** | Display of the variables selected in the first step. |
| **Properties window** | Prediction models and properties for the configuration of the data call.<br><br>If several variables are selected together, all models of these variables are shown. Models with the same name are only displayed as an entry. However, in the properties window, the properties of all models summarized therein are shown and edited:<br><br>▸ **Prediction model**: Display of the prediction models. A prediction model is automatically created for each variable.<br>Prediction models are added and deleted using the **+** and **X** symbols. These buttons are always applicable for all selected variables. If the selected variables have different prediction models, an error message is shown above the list and the list remains empty.<br><br>▸ **Model name**: Name of the prediction model.<br>Default name: *Prediction model*. With several models, the name is supplemented with a serial number.<br>The name must be unique for each model for each variable.<br>Can only be amended per variable or model, but not |

| Option | Description |
|---|---|
| | together, because this would lead to a validation error.<br>For details, see the **General** (on page 577) properties.<br>▸ **Periodicities**: Configuration of the periodicity. Addition and deletion is carried out using the **+** and **X** symbols.<br>For details, see the **General** (on page 577) properties.<br>▸ **Training data**: Configuration of the relationship of training data to validation data.<br>For details, see the **General** (on page 577) properties.<br>▸ **Data cleansing**: Configuration of data cleansing.<br>For details, see the **target variable** (on page 583) properties. |
| **Visualization window** | Display of the trend diagram for the selected prediction models. Only real data is displayed. Prediction data is not yet present. |

**NAVIGATION**

| Option | Description |
|---|---|
| **Previous** | Switches back to the **configuration of data call** step. |
| **Next** | Trains the prediction models.<br>The current step remains open in the event of validation errors. It is not switched further.<br>When validation is successful, there is a switch forward to the **model selection** step. |

## 27.1.4 Model selection

In the fourth step, you select the prediction models to be created.

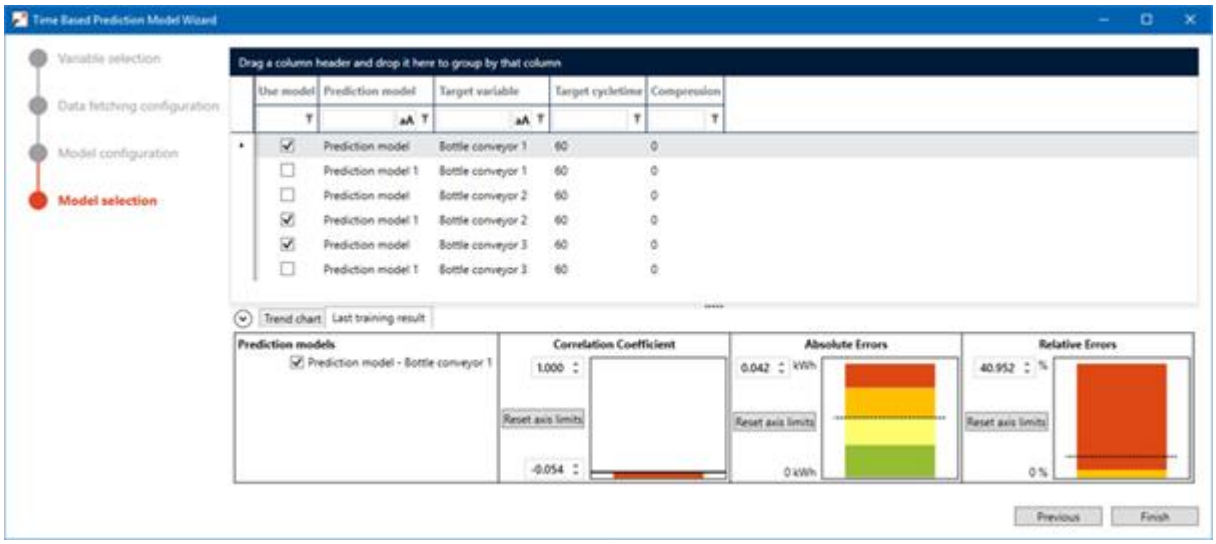
To select prediction models:

1. Select the desired prediction models by clicking in the checkbox:
   All models are selected by default.

   In the visualization windows, you can compare display and training results of all models.

2. Click on the **Close** button.

   The deselected prediction models are discarded.
   Selected prediction models are created and shown in the **Prediction Model Manager**.
   The wizard is closed.




| Option | Description |
|---|---|
| **Configuration of model configuration** | Display of the active step in the wizard. |
| **Prediction model window** | Display of the configured prediction models.<br>Selection and deselection using a checkbox in front of the model names.<br>Deselected models are discarded when closing the wizard; the selected models are transferred to the main overview. |
| **Visualization window** | Display of the trend diagram (on page 547) and the training results (on page 549) for the selected prediction models. |

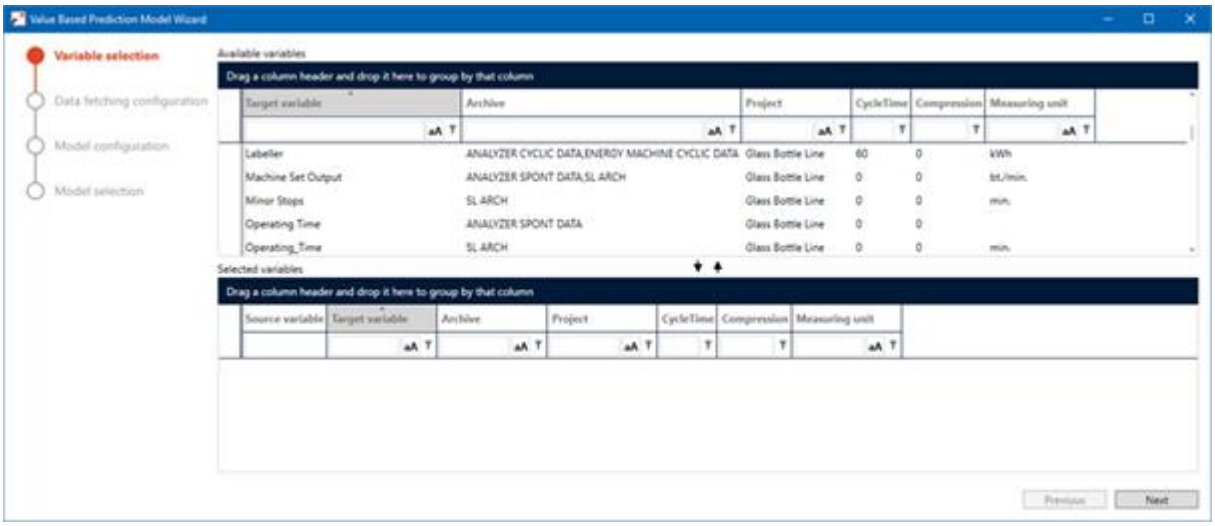
### NAVIGATION

| Option | Description |
|---|---|
| **Previous** | Switches back to the **model configuration** step. |
| **Next** | Applies the selected prediction model and closes the wizard. |

## 27.2 Create value-based prediction model

To create a value-based prediction model:

1. Start the wizard for value-based prediction models.
   To do this, select the corresponding entry in the **Prediction Model** entry or in the tool bar.
   The wizard is started.




2. The first step is to select the desired variables (on page 557).
3. Click on **Next**.
4. Configure the data call (on page 558).
5. Click on **Next**.

   The data for the prediction model is loaded.
6. Configure the model (on page 560).
7. Click on **Next**.
8. Select, if necessary, the models (on page 562) that are to be created.
9. Click on **Close**.

   The prediction models are created and shown in the **Prediction Model Manager**.

### NAVIGATION

Navigation through the wizard is with buttons in the lower right area:

- **Previous**: Returns to the previous step. This step back can be made at any point in the wizard.
  When going back, configured data is sometimes retained, if possible.

- **Next**: Goes to next step.
  If there is a validation error, navigation is prevented until the error has been rectified.
  Not present on the last page of the wizard.
- **Exit**: Creates the prediction model and closes the wizard.
  Only present on the last page of the wizard.

The progress of the configuration is shown by the vertical progress display on the left edge.
To cancel the wizard, close it by clicking on the X button on the top right. In this case, all entries are discarded and the prediction model is not created.

### 27.2.1Variable selection

In this step, you select the variables for which the prediction model is to be created.

To select variables:

1. Highlight the desired variables in the list of **available variables**.
   Multiple selection is possible with **Ctrl key** + mouse click or **Enter key** + mouse click.
2. Click on the down arrow between the two lists.

   The selected variables are added to the list of **selected variables**.
   Individual variables can also be added with a double click.

   There is a line each for a unique combination of variable, cycle time and aggregation displayed. If this combination is present in several archives, they are shown separated by a comma in the **Archives** column.

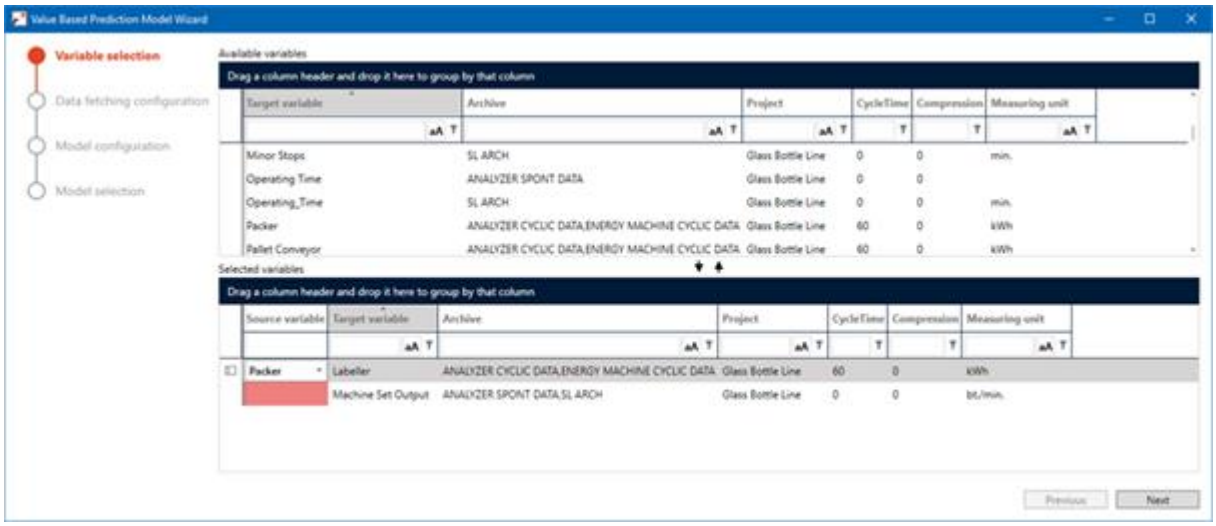
   To remove variables from the list again:

   - Double-click on the variable.
   - Or: Highlight the variable and click on the up arrow.
3. Select a source variable for each target variable.
   To do this:

   a) Click on the field with the red background in the **Source Variable** column in the **Selected Variables** window.

   b) Select the desired source variable from the drop-down list.
4. Click on the **Next** button.

The wizard checks the input and switches to the next step.




| Option | Description |
|---|---|
| **Variable selection** | Display of the active step in the wizard. |
| **Available variables** | List of available variables. |
| **Arrow keys** | Move selected variables from one list to the other.<br>Variables can also be moved by double clicking. |
| **Selected variables** | List of selected variables.<br>Add a source variable for each variable in the list.<br>**Note:** only variables that have the same cycle time and aggregation as the target variable can be selected. |

**NAVIGATION**

| Option | Description |
|---|---|
| **Previous** | Not available in the first step. |
| **Next** | Switches further to the **configuration of data call** step. |

## 27.2.2 Data fetching configuration

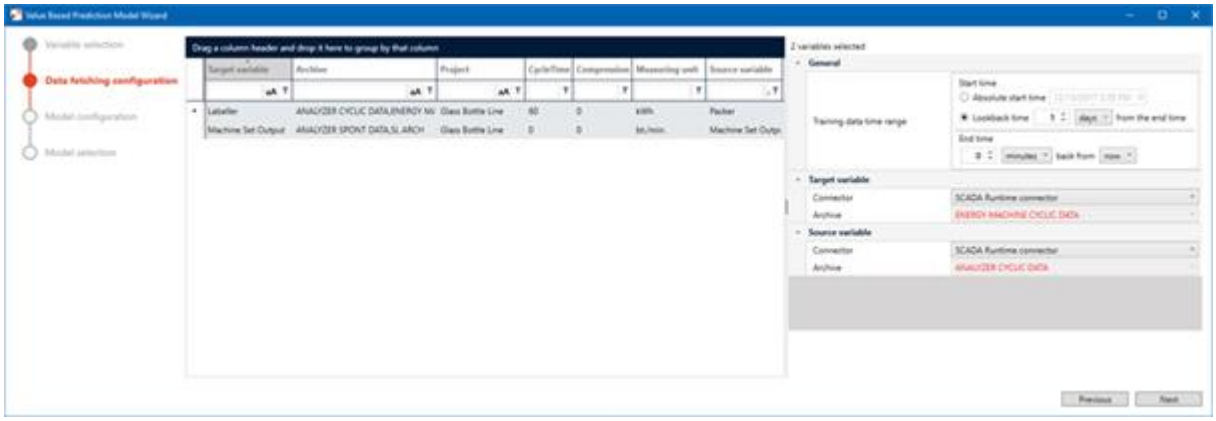
In the second step, you configure the settings for the fetching of data that are needed for the training of the models.

To configure the data call:

1. Highlight the desired variables in the list of **available variables**..
2. Select the desired properties in the **properties window** and amend their values.

   You can configure several variables together. Properties with different settings are highlighted in red. All changes to properties are applied to all variables together
3. Click on the **Next** button.

   The wizard checks the input and switches to the next step.



| Option | Description |
|---|---|
| **Data fetching configuration** | Display of the active step in the wizard. |
| **Variables window** | Display of the variables selected in the first step. |
| **Properties window** | Properties for the configuration of the data call:<br>▸ **Training data time range**: Selection of the time period for the training. For details, see the **General** (on page 577) properties.<br>▸ **Connector**: Selection of the connector from the drop-down list.<br>Configuration for both target variable and source variable.<br>▸ **Archives**: Selection of the archive from a drop-down list. Configuration for both target variable and source variable. For details, see the properties for **target variable** (on page 583) and **source variable** (on page 585). |

### NAVIGATION

| Option | Description |
|---|---|
| **Previous** | Switches back to the **variable selection** step. |
| **Next** | Validates input and gets the data for the variables for the set time period from the set data sources.<br>The current step remains open in the event of validation errors. It is not switched further.<br>When validation is successful, there is a switch forward to the **model configuration** step. |

### ERROR HANDLING

If an error occurs during validation, the wizard switches to the next step. An error message is shown above the list. The incorrect variables are marked and given an error notice. It is possible to switch further once the error has been rectified.

Hint: A frequently-occurring error when getting data is that there are several data points for exactly the same time stamp. A corresponding error message for the first of the time stamps concerned is shown; all time stamps are shown with duplicated values in the LOG file.

## 27.2.3 Model configuration

In the third step, you create and configure prediction models for the selected variables.

To create and configure prediction models:

1. Highlight the desired variables in the list of **available variables**.

   There is already a prediction model for each variable.

2. Add further prediction models if required.
   To do this, click on the green **+** symbol.
   Prediction models can be added for all variables or for individual variables. If several variables are to be configured together, they must have the same prediction model.
   To remove a prediction model again, highlight the prediction model and click on the red **X**.
   There must always be a prediction model.

3. Select the desired properties in the **properties window** and amend their values.

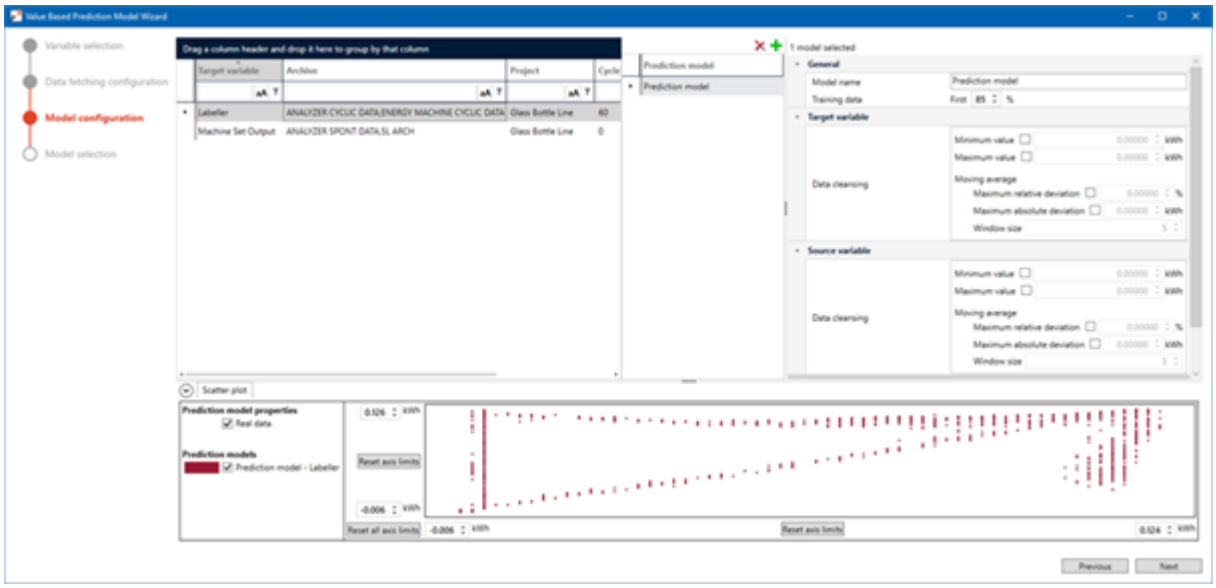
   You can configure several variables and prediction models together. Properties with different settings are highlighted in red. All changes to properties are applied to all variables and prediction models together

   The trend diagram for the selected models is shown in the visualization window.

4. Click on the **Next** button.

   The wizard checks the input and switches to the next step.

## DIALOG



| Option | Description |
|---|---|
| **Configuration of model configuration** | Display of the active step in the wizard. |
| **Variable window** | Display of the variables selected in the first step. |
| **Properties window** | Prediction models and properties for the configuration of the data call.<br><br>If several variables are selected together, all models of these variables are shown. Models with the same name are only displayed as an entry. However, in the properties window, the properties of all models summarized therein are shown and edited:<br><br>▸ **Prediction model**: Display of the prediction models. A prediction model is automatically created for each variable.<br>Prediction models are added and deleted using the **+** and **X** symbols. These buttons are always applicable for all selected variables. If the selected variables have different prediction models, an error message is shown above the list and the list remains empty.<br><br>▸ **Model name**: Name of the prediction model. |

| Option | Description |
|---|---|
| | Default name: *Prediction model*. With several models, the name is supplemented with a serial number.<br>The name must be unique for each model for each variable.<br>Can only be amended per variable or model, but not together, because this would lead to a validation error.<br>For details, see the **General** (on page 577) properties.<br>▸ **Training data**: Configuration of the relationship of training data to validation data.<br>For details, see the **General** (on page 577) properties.<br>▸ **Data cleansing**: Configuration of data cleansing for target variable and source variable.<br>For details, see the **target variable** (on page 583) and **source variable** (on page 585) properties. |
| **Visualization window** | Display of the scatter plot for the selected prediction model. Real data is displayed. Predictive data will be generated later. |

NAVIGATION

| Option | Description |
|---|---|
| **Previous** | Switches back to the **configuration of data call** step. |
| **Next** | Trains the prediction models.<br>The current step remains open in the event of validation errors. You do not proceed further.<br>When validation is successful, there is a switch forward to the **model selection** step. |

## 27.2.4 Model selection

In the fourth step, you select the prediction models to be created.

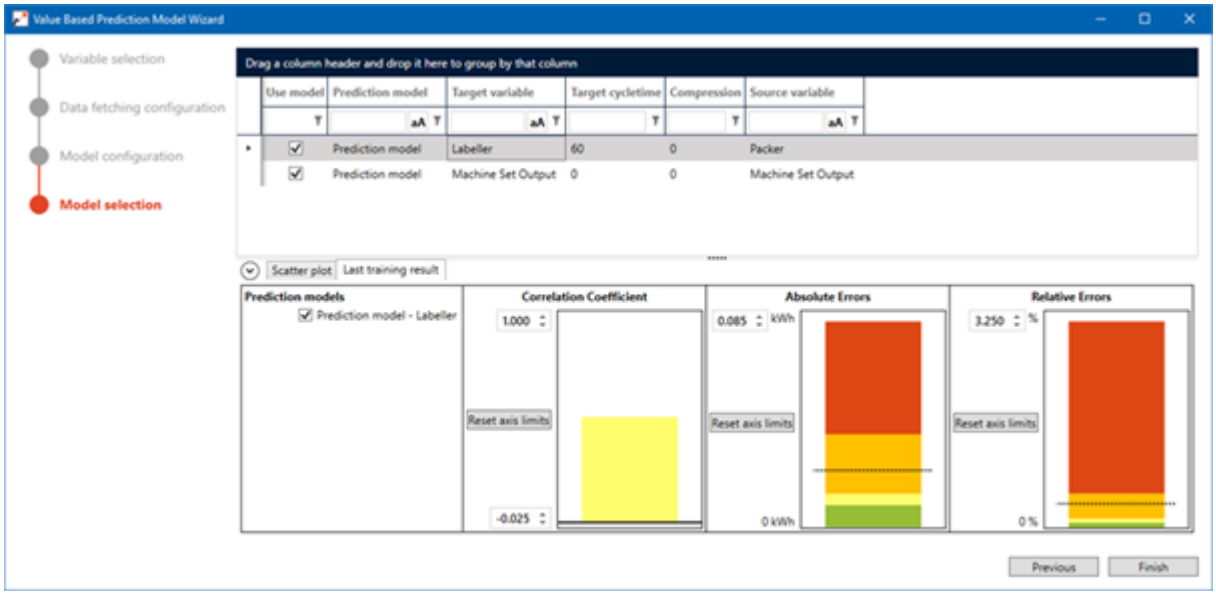
To select prediction models:

1. Select the desired prediction models by clicking in the checkbox:
   All models are selected by default.

In the visualization windows, you can compare display and training results of all models.

2. Click on the **Close** button.

   The deselected prediction models are discarded.
   Selected prediction models are created and shown in the **Prediction Model Manager**.
   The wizard is closed.



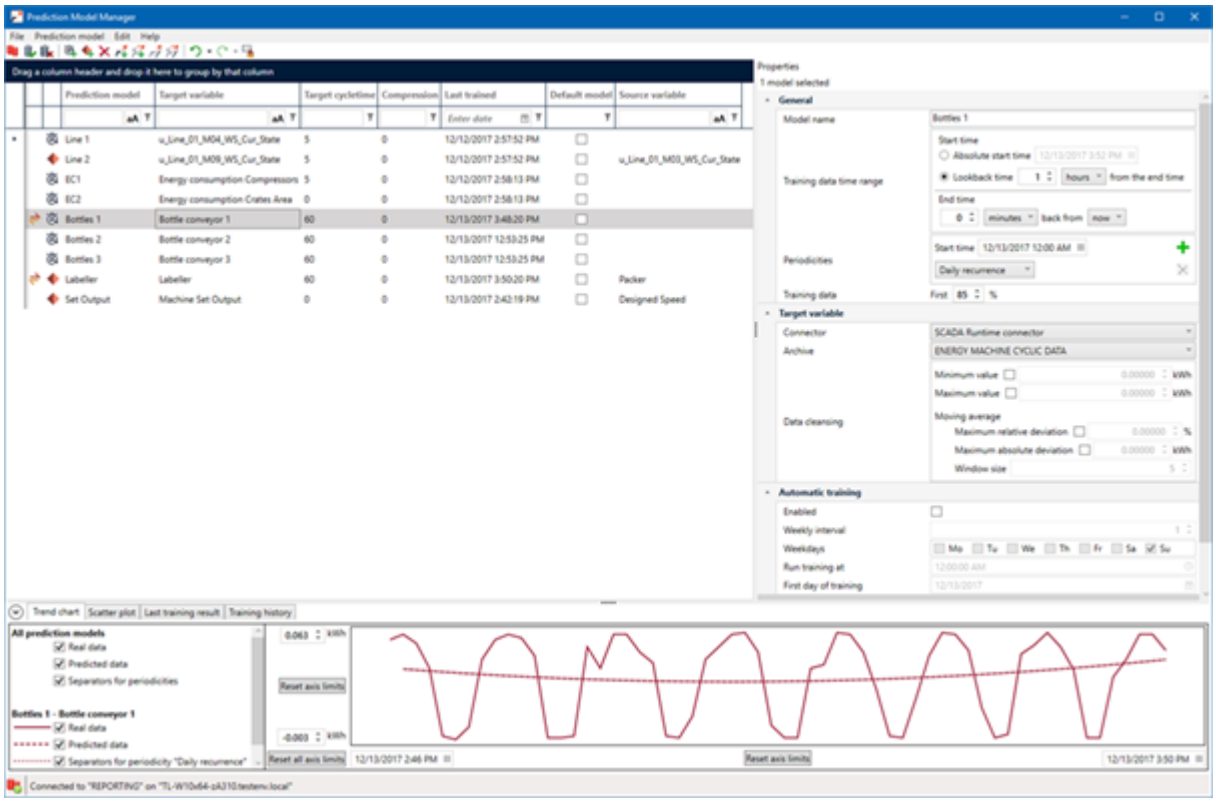

| Option | Description |
|---|---|
| **Configuration of model configuration** | Display of the active step in the wizard. |
| **Prediction model window** | Display of the configured prediction models.<br>Selection and deselection using a checkbox in front of the model names.<br>Deselected models are discarded when closing the wizard; the selected models are transferred to the main overview. |
| **Visualization window** | Display of the **scatter plot** (on page 548) and the training results (on page 549) for the selected prediction models. |

## NAVIGATION

| Option | Description |
|---|---|
| **Previous** | Switches back to the **model configuration** step. |
| **Next** | Applies the selected prediction model and closes the wizard. |

# 28 Edit prediction models

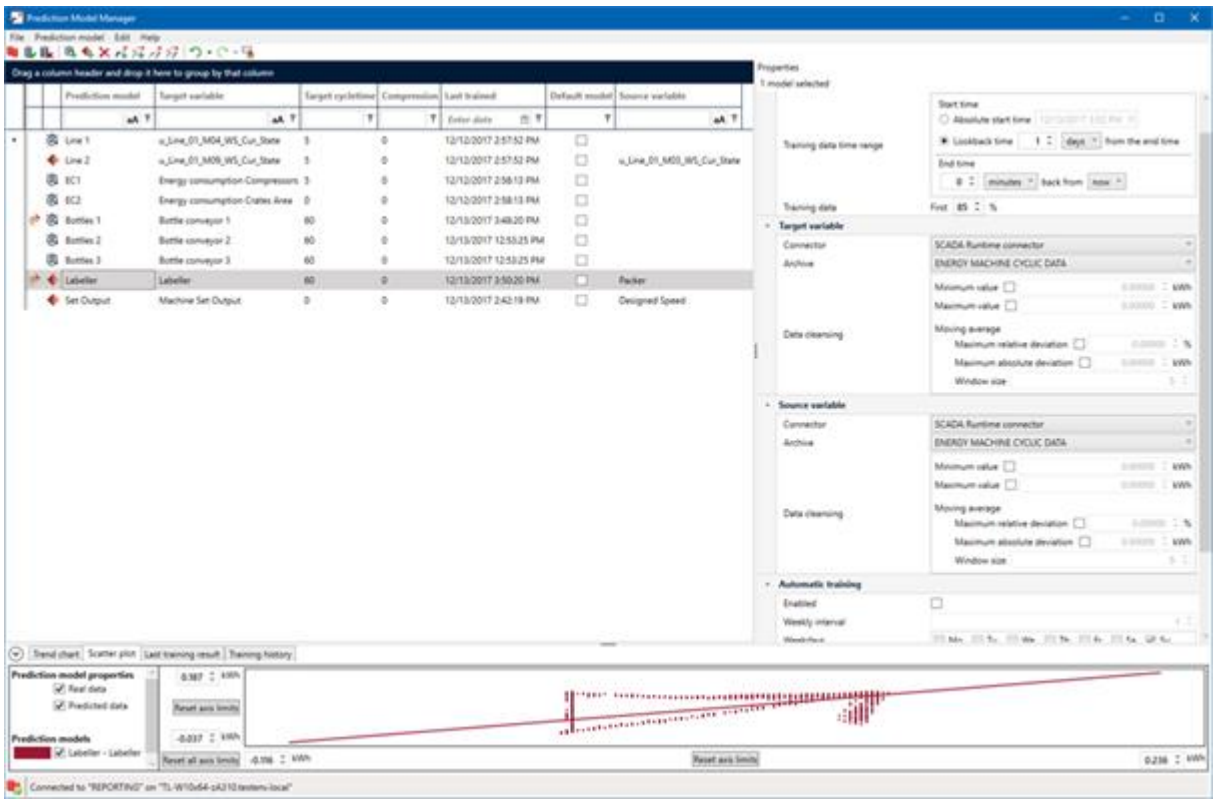
Every prediction model can be edited in the **Prediction Model Manager** at any time.



To edit a prediction model:

1. Select the desired prediction model in the list.
2. Edit the properties (on page 576) of the prediction model.
3. Retrain the prediction model.
4. Save the prediction model.

Several prediction models can also be edited together. In doing so, properties with different values are shown in red font.



# 29 Train prediction models

Prediction models must be trained. The training is configured in the **Prediction Model Manager**. Training can also be carried out automatically.

## CONFIGURE TRAINING

To configure training:

1. Select the model to be configured.
   Multiple selection is possible.
2. Configure the time period (on page 577) for the training.

a) Stipulate the **start time**.

b) Stipulate the **end time**.

3. Configure the relationship of the **training data** to validation data.
4. If you want to automatically execute the training in regular intervals again, configure **automatic training:**

   a) In the automatic training area, click on checkbox for **activated**.

   b) Select the week interval

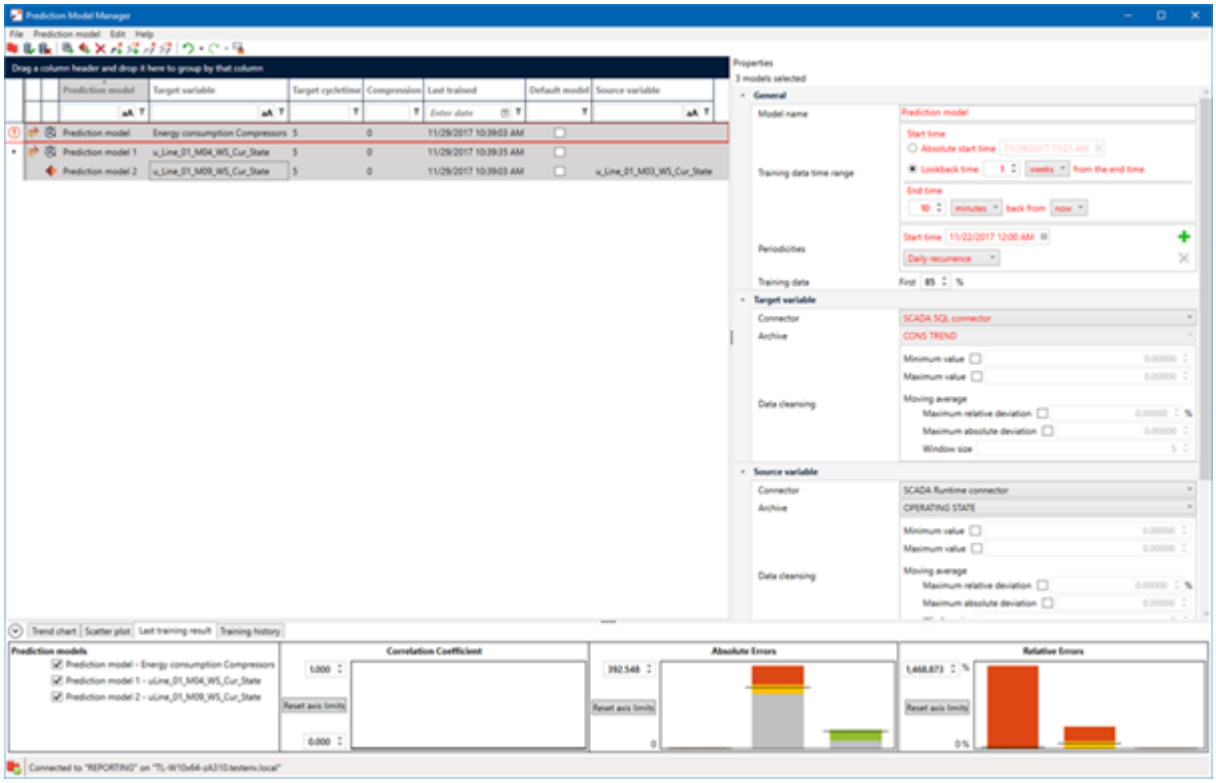
   c) Select the weekdays on which the training is to be carried out.

   d) Configure the time at which the training is to be carried out.
   Relative time indications relate to this time.

   e) Configure the first day of the training.

5. Carry out the initial training.
6. Save the configuration.

## USER INTERFACE



| User interface area | Description |
|---|---|
| **List of prediction models** | Displays all prediction models. Multiple selection is possible. |

| User interface area | Description |
|---|---|
| | Symbols to the left of the name show the respective status and type.<br><br>**Symbol column 1:Error**<br><br>▸ Exclamation mark:<br>Validation error. Details about the error are displayed in the tooltip. It is only possible to save changes once no more errors are shown.<br><br>**Symbol column 2:State**<br><br>▸ Arrows:<br>Prediction model contains unsaved changes<br><br>▸ Question mark:<br>Prediction model was changed and must be retrained.<br><br>**Symbol column 3:Type**<br><br>▸ Clock:<br>Time-based prediction model<br><br>▸ Hash:<br>Value-based prediction model<br><br>The further columns inform you of:<br><br>▸ Target variable<br>▸ Target cycle time<br>▸ Aggregation<br>▸ Time of last training<br>▸ Activation as a default model<br>▸ Source variable |
| **Properties** | Properties for the configuration of the models and the training.<br><br>With multiple selection:<br><br>▸ The properties of the model selected first are displayed<br>▸ Properties with different values are highlighted in red<br>▸ Validation errors for the model selected last are shown<br>▸ Changes have an effect on all selected models |
| **Display range** | Visualization of the models and the training results using four tabs: |

| User interface area | Description |
| --- | --- |
| | ▸ **Trend chart**<br>▸ **Scatter plot**<br>▸ **Last training result**<br>▸ **Training history** |

# 30 Cache for real data

To speed up training and prediction, the data loaded via the Runtime connector or SQL connector is kept in the background in a cache.

Data is loaded into the cache when:

- Training of models in the main view.
- Loading data in the main view.
- Loading data for the creation of models in the wizards (transition to step 3).

If necessary, the data in the cache can be removed from the tool bar manually using the **Edit** menu or the tool bar.

# 31 Properties

The properties of the prediction models are used identically in the configuration interface and in the wizards.

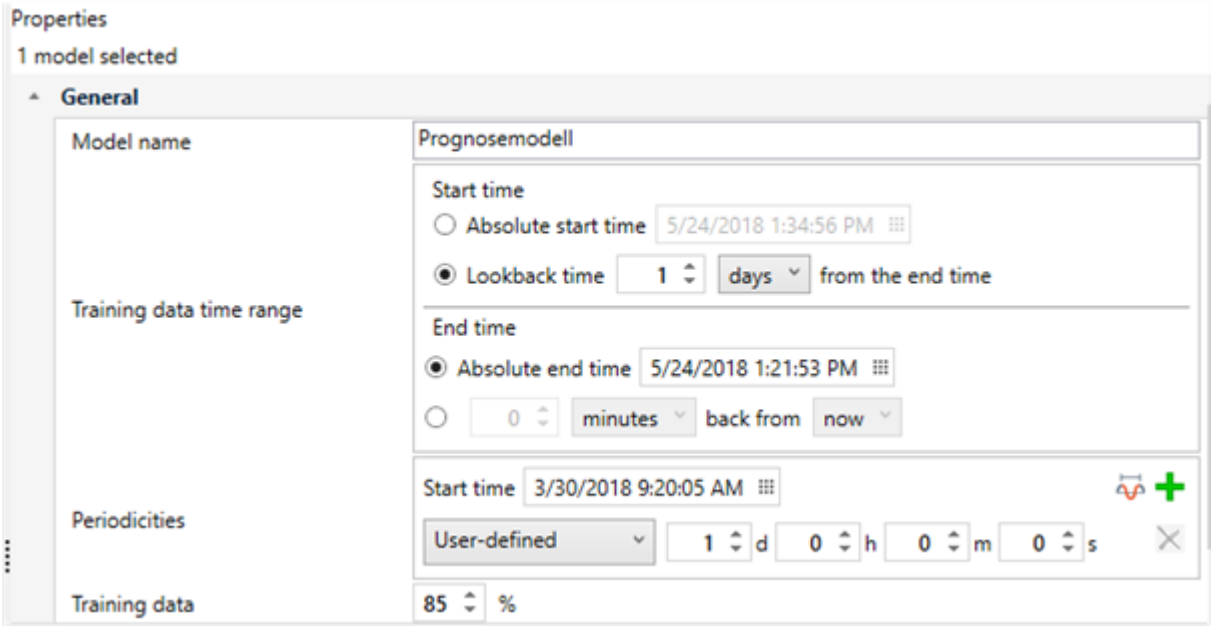
The properties of several selected models can be edited at the same time. If the properties of the selected models have contradictory values, the respective properties are shown in red font. If only the value of one property is different, the complete property is marked in red. In this case, the respective value of the first selected model is displayed. If a value of a property is amended, this value is applied to all selected models.

In the event of validation errors in the properties, the invalid values are not applied in the model. Only if the property has been configured validly are the values also present in the model, available for training and able to be saved.

Configuration notes and a link to the manual are shown in the window for the embedded help for the properties.

## 31.1 General

Configuration of the name, the periodicity and the training data for the prediction model.




### 31.1.1 Model name

Stipulation of the model name.

| Property | Description |
|---|---|
| **Model name** | Entry of the name of the prediction model.<br>The name is for:<br>▸ Naming in the **Prediction Model Manager**<br>▸ To find the prediction model in the report in which it is used for the prediction of data |

**Note:** Models for different variables that are to be used together in reports should have the same name so that the model in the report can be used for all variables. For the display of 3 variables, each with a prediction, for example.
Alternative: The models are named differently but each activated as a default model. The models can thus be selected in the report using the default option.

## 31.1.2 Training data time range

Defines the time period for which the data is considered for training for the variable upon which the variable is based.
If, as a result of the combination of absolute start time and end time, an empty (or negative) time period results, an error is issued during training.

| Property | Description |
|---|---|
| **Start time** | Entry of the start time for the time period for which the training is to be executed. This can be entered as absolute or relative. Selection by clicking in the radio button:<br>▸ **Absolute start time**: Must not be in the future. Must be before the **end time**.<br>▸ **Look back time**: From the perspective of the end time. |
| **Absolute start time** | Selection of the absolute start time for the training period. Entry is in the field directly or by means of selection from the calendar module. |
| **Look-back time** | Stipulation of the start time relative to the time of the end of training.<br>Configuration using the following elements:<br>▸ Numerical input<br>▸ Entry of unit from a drop-down list<br>There are several intervals available.<br>▸ Minimum: *1 second*<br>▸ Maximum: *1000 years*<br>For example: *30 Minutes* before the end time. |
| **End time** | Entry of the end time for the time period for which the training is to be executed. Selection by clicking in the radio button:<br>▸ **Absolute end time**<br>▸ Retroactive entry of time<br>Configuration by means of the following elements<br>▸ Numerical input<br>▸ Entry of unit from a drop-down list<br>▸ Selection of retroactive reference time point from drop-down list |

| Property | Description |
|---|---|
| | There are several intervals available.<br>▸ *0 seconds* to *1000 years*<br>▸ Related to a time point between *now* and *end of last fully-completed year*<br>For example: *10 Minute* retroactive from *now*. |
| **Absolute end time** | Selection of the absolute end time for the training period. Entry is in the field directly or by means of selection from the calendar module.<br>Must be after the **absolute start time** and after 1. 1. 1970. |

**Example:**

- Start time: *1 day* before the end time
- End time: *0 minutes* retroactive from *end of last fully-completed day*
- Start of training: *2018-06-30; 12:00*
- Result: The training is carried out for the time period *2018-06-29; 00:00 - 23:59*

## 31.1.3 Periodicities

This property stipulates the recurrence cycles within data for time-based prediction models. Appropriate selection of the periodicities is decisive for the meaningful functioning of time-based models that contain recurrences.

Periodicities are always calculated from the model start time in local time.

**Note:** Further periodicities are also possible. These can be nested in one another.

### Information

The Fast Fourier Transform (FFT) method is used to detect the periodicity. It calculates the frequencies contained in a period of time (sine/cosine part).

### PERIODICITY DETECTION

The periodicity detection can detect a period and a long-term trend. Nested periodicities are not detected. The periodicity detection supports you when finding the periods, but manual checking of the periods by the user is necessary however.

The following is applicable for periodicity detection:

- The time of the first available variables is always used as the start time point for the periods.
- If too little data is available, the *no recurrence* period is used.
- Only regular periods can be detected; fluctuating period lengths lead to unsuitable results.
- The periodicity detection only works for data logged in even periods. Individual gaps are filled using interpolation. If the data is present at uneven time periods however, no periodicity is detected. In this case *no recurrence* is used as periodicity.
- If the data is only recorded with gaps, this can lead to the intervals of the gaps being interpreted as periods. To avoid this, a period of time without interruption must be used for the periodicity detection.
- If a period is detected that is almost exactly a round unit (full hours, days, weeks, years), this round period is used. The deviation must be a maximum of one in a thousand for this.
- Both the start time of the periodicities as well as the start time of the training data limit the data used.
  The later of the two time points is used for the limitation.
- If the **Auto-Detect Periodicity** symbol is clicked on several times consecutively, the start time always moves backwards by one cycle time of the variables. The user can thus attempt to detect a period several times. Due to the respective small amount of other data, it is possible that a period can be detected that was not detected in an earlier combination.

## PERIODICITY DETECTION PROPERTY

This property is only available for time-based prediction models.

| Property | Description |
|---|---|
| **Start time** | Defines the start time of the model. This must not be exceeded in the report.<br><br>Entry is in the field directly or by means of selection from the calendar module. |
| **Recurrence** | Type of recurrence. Selection from drop-down list and numerical element. If a recurrence is selected, a numerical element can be used to configure the number of recurrences.<br><br>**Numerical element:**<br>Is displayed for fixed recurrences.<br>- Minimum *1*<br>- Maximum: *1000*<br><br>**Drop-down list:**<br>Selection of the cycle. |

| Property | Description |
|---|---|
| | ▸ *No recurrence*: The model also contains a non-cyclical part. That is a long-term trend that does not recur.<br>▸ *Second(s):* Recurrence every *n* seconds.<br>▸ *Minute(s):* Recurrence every *n* minutes.<br>▸ *Hour(s)*: Recurrence every *n* hours.<br>▸ *Day(s)*: Recurrence every *n* days. (Default)<br>▸ *Week(s)*: Recurrence every *n* weeks.<br>▸ *Month(s):* Recurrence every *n* months.<br>▸ *Quarter(s):* Recurrence every *n* quarters.<br>▸ *Year(s)*: Recurrence every *n* years.<br>▸ *User-defined*: Individual configuration using input elements for days, hours, minutes and seconds.<br>Minimum: *0 t - 0 h - 0 m - 1 s*<br>Maximum: *1000 t - 1000 h - 1000 m - 1000 s*<br><br>**n*: Corresponds to the information given in the numerical element.<br><br>The use of several periodicities makes it possible to illustrate several periodicities, each contained in the data.<br><br>**Periodicity**<br>▸ Automatically detect: Click on the symbol for automatic detection<br>▸ Add: Click on the +- symbol.<br>▸ Delete: Click on the X symbol.<br><br>The sequence in which the periodicities are defined does not play a role. The periodicities must be unique.<br>**Number of periodicities:**<br>▸ Maximum: unlimited<br>▸ Minimum: one |

**Example:**

Production facility with annual cycles and daily cycles, as well as a trend throughout years.
Configuration:

- *No recurrence*

- *Yearly recurrence*
- *Daily recurrence*

### DETECT PERIODICITIES AUTOMATICALLY

Periodicities can be detected automatically. This is possible in two areas in ZAMS:

- Wizard:
  In the wizard for time-based models, the periodicity detection is executed automatically when switching to the model configuration. This is displayed by a progress bar and can also be interrupted. When interrupting the periodicity detection, the periodicity is entered as *no recurrence* and with the start time of midnight of the current date.

  The data adjustment is not yet taken into account with this initial periodicity detection. This is only configured in the model configuration. The detection can then be carried out a further time in the wizard or in the main view.
- Main window:
  In the main window, the automatic periodicity detection is started using the corresponding symbol for the **Periodicities** property.
  If, when detecting the periodicities, the data for the model has not yet been loaded, it is loaded.

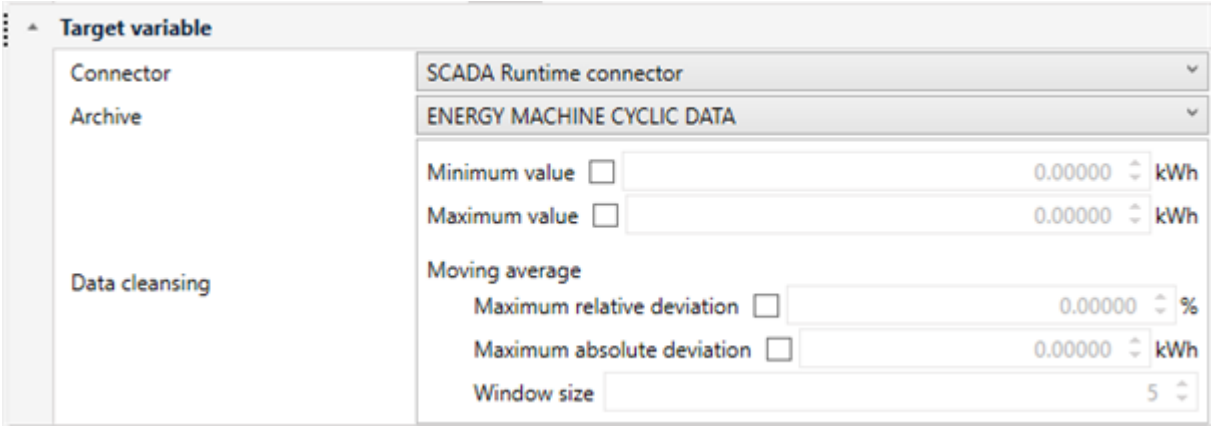
## 31.1.4 Training data

The property stipulates how the data available in the training period is divided between training and validation of the model.

| Property | Description |
|---|---|
| **Training data** | Configuration of the distribution of the data into training and validation in percent. The value entered here defines the proportion of training data. The values missing 100% are used for the validation.<br>- Minimum: *5 %*<br>- Maximum *95 %*<br>Default: *85 %*<br>The training data is selected at random from the values for the X-axis (time stamp with time-based models, values of the source variable for value-based models). |

## 31.2 Target variable

Configuration of connector, archive and data cleansing for the target variables.




### CONNECTOR

Selection of the connector for getting the data.

| Property | Description |
|---|---|
| **Connector** | Selection of the connector from the drop-down list.<br>▸ *SCADA Runtime connector*<br>▸ *SCADA SQL connector*<br>With **SCADA Runtime connector**: Ensure that Runtime is running on the target system. |

### ARCHIVE

| Property | Description |
|---|---|
| **Archive** | Selection of the archive for the target variable from a drop-down list.<br>All archives in which the target variable is present in the cycle time and aggregation is established for the variable are available for selection.<br>The combination of variable, cycle time and aggregation was stipulated in the wizard. This can no longer be used.<br>**Note:** If several prediction models have been selected for editing, this property can only be changed if the same archive is assigned to all models. |

### DATA CLEANSING

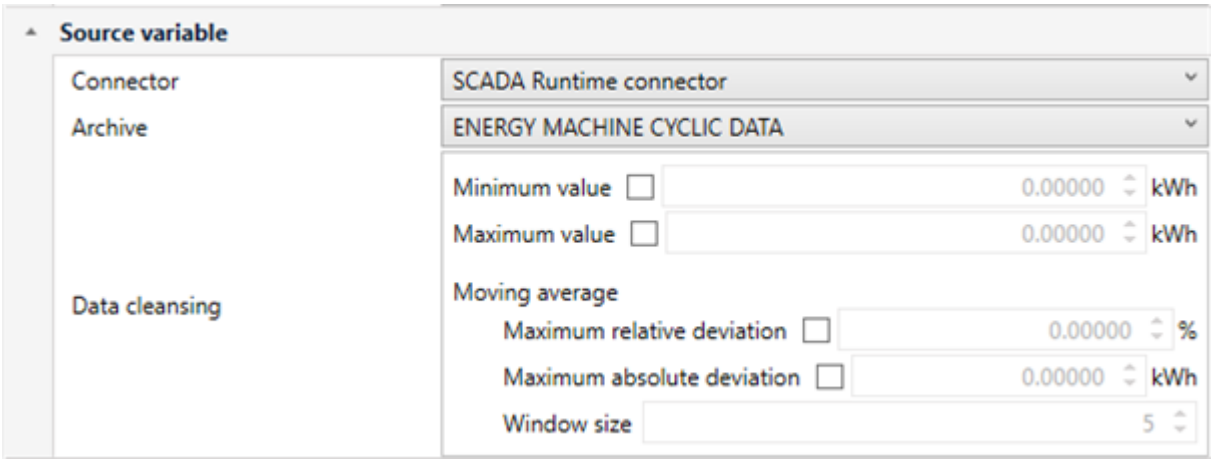
Configuration of which values are not used for training and validation. Implausible and disruptive data can thus be filtered out.

| Property | Description |
|---|---|
| **Data cleansing** | Settings for data cleansing.<br><br>To use properties, activate them with a checkbox and then configure them. |
| **Value minimum** | Absolute minimum value that can be used.<br><br>Entry in the numeric field or configuration using the arrow keys. With variables with a unit, the corresponding unit is displayed.<br><br>Must be less than the **maximum value** if that has been configured. |
| **Value maximum** | Absolute maximum value that can be used.<br><br>Entry in the numeric field or configuration using the arrow keys. With variables with a unit, the corresponding unit is displayed.<br><br>Must be greater than the **minimum value** if that has been configured. |
| **Moving average** | Data cleansing with a moving average can be configured using absolute values and relative deviation.<br><br>The absolute and relative deviation for the moving average is applicable for both upwards and downwards. In contrast, the minimum value and maximum value only relate to the upper and lower values. |
| **Maximum relative deviation** | Relative deviation for the moving average.<br><br>Input of the percentage figure in the numeric field or configuration via arrow keys. |
| **Maximum absolute deviation** | Absolute deviation for the moving average.<br><br>Input of the percentage figure in the numeric field or configuration via arrow keys. |
| **Window size** | Can only be configured if one of the values is active for **moving average**. Stipulates the size of the window for the moving average.<br><br>Entry in the numeric field or configuration using the arrow keys. |

| Property | Description |
|---|---|
| | Minimum: 2 |

## 31.3 Source variable

Configuration of connector, archive and data cleansing for the source variables.




### CONNECTOR

Selection of the connector for getting the data.

| Property | Description |
|---|---|
| **Connector** | Selection of the connector from the drop-down list.<br>▸ *SCADA Runtime Connector*<br>▸ *SCADA SQL Connector*<br>With **SCADA Runtime connector**: Ensure that Runtime is running on the target system. |

### ARCHIVE

| Property | Description |
|---|---|
| **Archive** | Selection of the archive for the source variable from a drop-down list.<br>All archives in which the source variable is present in the cycle time and aggregation is established for the variable are available for selection. |

| Property | Description |
|---|---|
| | The combination of variable, cycle time and aggregation was stipulated in the wizard. This can no longer be used.<br><br>**Note:** If several prediction models have been selected for editing, this property can only be changed if the same archive is assigned to all models. |

### DATA CLEANSING

Configuration of which values are not used for training and validation. Implausible and disruptive data can thus be filtered out.

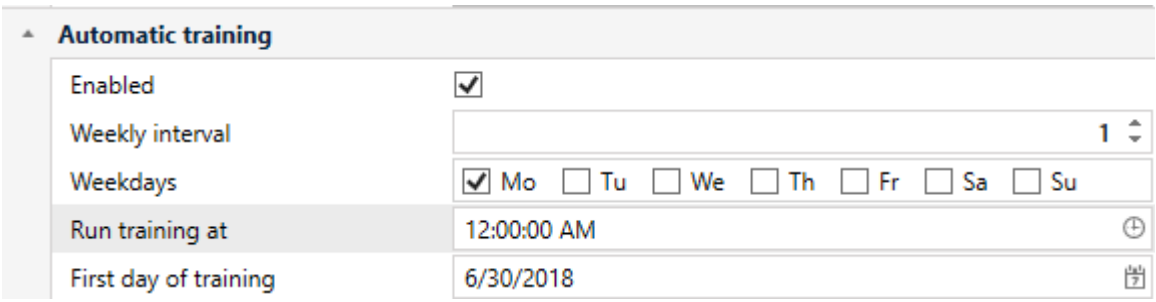
| Property | Description |
|---|---|
| **Data cleansing** | Settings for data cleansing.<br><br>To use properties, activate them with a checkbox and then configure them. |
| **Minimum value** | Absolute minimum value that can be used.<br><br>Entry in the numeric field or configuration using the arrow keys. With variables with a unit, the corresponding unit is displayed.<br><br>Must be less than the **maximum value** if that has been configured. |
| **Maximum value** | Absolute maximum value that can be used.<br><br>Entry in the numeric field or configuration using the arrow keys. With variables with a unit, the corresponding unit is displayed.<br><br>Must be greater than the **minimum value** if that has been configured. |
| **Moving average** | Data cleansing with a moving average can be configured using absolute values and relative deviation.<br><br>The absolute and relative deviation for the moving average is applicable for both upwards and downwards. In contrast, the minimum value and maximum value only relate to the upper and lower values. |
| **Maximum relative deviation** | Relative deviation for the moving average.<br><br>Input of the percentage figure in the numeric field or configuration via arrow keys. |

| Property | Description |
|---|---|
| **Maximum absolute deviation** | Absolute deviation for the moving average.<br>Input of the percentage figure in the numeric field or configuration via arrow keys. |
| **Window size** | Can only be configured if one of the values is active for **moving average**. Stipulates the size of the window for the moving average.<br>Entry in the numeric field or configuration using the arrow keys.<br>Minimum: 2 |

## 31.4 Automatic training

Configuration of automatic training.

### AUTOMATIC TRAINING PROPERTIES




#### AUTOMATIC TRAINING

| Property | Description |
|---|---|
| **Enabled** | ▸ *Active*: Automatic training is executed in accordance with the configuration. The start time and end time for the area is stipulated in the properties of the **General** (on page 577)group. |
| **Weekly interval** | Configuration of the weekly interval in which training is carried out. Entry of a number or selection by means of the arrow keys.<br>▸ Minimum: *1*<br>▸ Maximum: *100* |

| Property | Description |
|---|---|
| | Default: *1*<br><br>Example: *3* - the training is carried out every 3rd week. There is thus a break for 2 weeks after each training. |
| **Weekdays** | Selection of the weekdays on which the training is to be carried out. Select by clicking in the checkbox in front of the day.<br><br>At least 1 day must be selected. |
| **Run training at** | Configuration of the time at which the training is carried out. Relative time indications relate to this time. |
| **First day of training** | Configuration of the first training day.<br>From this day on, the training will be carried out at the selected interval in the selected weekdays. The week in which the day falls is applicable as training week *1*. |

# 32 Service Grid

zenon Analyzer is also available in the Service Grid. To do this, the client communicates with the **Service Hub**, the SQL Server instance and the reporting services web services.

Configuration is carried out by means of:

- **ZAMS** in the **Options** ribbon
- **Service Grid backend** in the **Analyzer** section

# 33 Terminology

Terms that are used as part of the documentation for Service Grid:

| Term | Description |
|---|---|
| **Service Grid** | Distributed system, consisting of a central **Service Hub** and attendant **Service Nodes**. Allows connection to and secure networking with third-party components and cloud services. |
| **Service Hub** | Central administration and data transfer tool for the Service Grid. Consists of **Hub Controller** and **Data Hub**. |

| Term | Description |
|---|---|
| **Data Hub** | Central data transfer hub that receives information from **Service Nodes** and distributes it to other **Service Nodes**. |
| **Hub Controller** | Components of the Service Grid for the administration of **Service Nodes**, for example permissions and **Certificate Bundles**. |
| **Service Node** | Forms the interface to the Service Grid for **Prosumer**s and provides data. Communicates with the **Service Hub**:<br>▸ Service Node Analyzer:<br>Analyzer report templates for the configuration and display of reports, creation of predictions and execution of Stored Procedures.<br>▸ Service Node Editor:<br>SCADA configuration file<br>▸ Service Node Runtime:<br>Provides historic and online variable values, alarms and CEL. |
| **Prosumer** | Uses data from **Service Nodes** and online memory and/or provides this. |
| **Identity Service** | Central authentication services for queries from **Prosumer**s. |
| **Policy Service** | Uses information from the **Identity Service** to assign **Prosumer**s role-based permissions. |
| **Configuration Backend** | Provides functions for the administration of users, permissions, applications, connections and services. The user interface is web-based and is operated by means of a web browser. |
| **Service Grid API** | Provides data from the Service Grid to third-party systems by means of a defined interface.<br>**Note:** Replaces the Everywhere Server by zenon used up to zenon 8.00. |
| **REST Interface** | Programming interface that is orientated to the paradigms and behavior of the World Wide Web (WWW). **Service Grid API** module. |
| **Engineering Station** | Computer on which configurations for zenon Analyzer or zenon can be set up. Supplies configuration data for |

| Term | Description |
|---|---|
| | **Prosumer**s. |
| **zenon Runtime** | Component on which the zenon projects are executed. Supplies data for **Prosumer**s. |
| **Analyzer Server** | Central component of zenon Analyzer that is used for data administration and report creation and hosts the **Report Launcher**. |

# 34 Settings in zenon Editor for Service Grid

The use of zenon in the Service Grid requires certain prerequisites and settings in the zenon Editor for:

- Inclusion of zenon Runtime (on page 591)
- Synchronization with zenon Analyzer (on page 590)

## 34.1 Connection to service hub for the zenon project

You can configure the connection to the **Service Hub** for a zenon project in the project properties in the zenon Editor. This connection is used to enable the synchronization of data between the zenon Editor and zenon Analyzer. It is also a requirement for the configuration of a connection to the **Service Grid Gateway**.

### Attention

This configuration enables the transfer of data from zenon to zenon Analyzer.

You configure the connection of the zenon Runtime to the Service Grid:

- For zenon 810, with the **Service Node Configuration Tool**.
- For zenon 8.20 or higher, with the **Execute Service Grid Gateway** property and the **Service Node Configuration Tool**.

To configure the connection from the zenon Editor to the **Service Hub**:

1. Highlight the project.
2. Go to the **Network** node in the properties.
3. Go to the **Service Grid** area.

4. In the **Service Hub** property, select the desired type of connection to the **Service Hub** from the drop-down list:
   - *<No service hub selected>*: No connection to a service hub is established. Existing connections are separated in the zenon Editor.
   - *<Apply from the global project>*: The service hub configured in the global project is used. The setting is taken from the global project and entered. If there is no global project or no service hub has been configured there, no entry is created for this project.
   - *<configured service hubs>*: List of all available connections.

The selected connection is entered in the **project.ini** when the Runtime files are created.

## 34.2 Service Grid Gateway

The **Service Grid Gateway** enables exchange of data between Runtime and Service Grid as well as between the HTML web engine and Service Grid.
This requires corresponding configuration in the zenon Editor. In the Runtime, the project is connected to the Service Grid if necessary. To do this, a connection must be configured in the Service Grid (SNCT). Actions in the Runtime are logged in the **Service Grid Gateway** module. The connection can only be configured for individual projects and is not available for the global project.

> **Attention**
>
> Do not use the **Service Grid Gateway** at the same time as the **Service Grid Runtime Add-In**.

### CONFIGURATION IN THE ZENON EDITOR

To enable a connection in the Runtime, configure the following properties in the zenon Editor:

- **Service Hub**
  Must contain a value. The *No service hub selected* entry must not be selected.
- **Execute Service Grid Gateway**
  The checkbox must be ticked.
  **Attention:** Only available if **Service Grid Gateway** is included in the license.

If *Apply from global project* is selected as **Service Hub**, the setting is taken from the global project and entered. If there is no global project or no service hub has been configured there, no entry is created for this project.

### SERVICE NODE CONFIGURATION TOOL (SNCT)

The service node configuration tool is able, in the Runtime, to establish connections to:

- **Runtime Add-In**: For zenon 8.10. Is displayed as **zenon Runtime AddIn**.

- **Service Grid Gateway**: For zenon 8.20 or higher. Is displayed as **zenon Runtime**.

### BEHAVIOR IN THE RUNTIME

The following conditions must be met in order for the **Service Grid Gateway** to establish a connection for a project:

- The checkbox for the **Execute Service Grid Gateway** property has been activated.
- The current license contains the **Service Grid Gateway**.
- The project has been configured in the SNCT for a connection to the **Service Hub**.
- The project is a standalone project or the current Runtime is the active server for this project in the network.
  The connection is closed if another Runtime takes on the server role.

If the project is reloaded in the Runtime, the connection is closed before reloading and restarted after reloading.

## 34.2.1Actions for HTML Web Engine and Service GridAPI

Data for the HTML Web Engine or Service Grid API are provided if necessary.

### 34.2.1.1 AML and CEL

Possible actions for alarms and events with **Service Grid Gateway**:

**Alarm administration:**

- Publish current alarms (from ring buffer)
- Publish current alarms (AML)
- Set alarm causes
- Set alarm comments
- Acknowledge alarms

**Chronological Event List**

- Publish current events (ring buffer)
- Publish historic events (CEL)
- Set event comments

> **Attention**
>
> In order for elements to be published or changes to be made (set cause/comment, acknowledgment), one of these conditions must be applicable:
>
> - The variable to which they refer is visible for the Service Grid
> - It is a system event

**Note:** In order to use zenon variables in Service Grid, they must be configuredfor it, using the **Service Grid settings**/**Access permission** property.

### 34.2.1.2 Archive data

A query can request recorded data for a certain time period from an archive, for one or all variables that are contained in the archive and that have been unlocked for use by ServiceGrid.

Required information:

- Archive identification
- Start time (date and time in UTC)
- End time (date and time in UTC)
- List of the variables that are needed for the data.

#### RULES

**The following is applicable for queries:**

- If the start time is greater than or not equal to the end time, the request will fail. A corresponding error message is given.
- The response contains data for all variables that are contained in the archive and that contain at least one data set for the given time range.

**The following is applicable for the list of variable names:**

- Placeholders (* and ?) are permitted.
- Variable names with and without placeholders can be combined.
- Empty list: All variables are output.
- Variable name without placeholder:
  - Each variable name must find precisely one target variable. The variable must be unlocked for Service Grid.
    All conditions must be met. Otherwise the query is canceled and an error message is issued.

- Variable name with placeholder:
  - All variables that do not correspond to the filter with placeholder and are unlocked for Service Grid are output.
    An empty response is returned if this does not apply to any variable.

#### 34.2.1.3 Context lists

Possible actions for context lists with **Service Grid Gateway**:

- The initial content is published after the connection to the **Service Hub** has been established and the Runtime information has been published.
- The new content is published each time a context list is changed.
- Entries marked as deleted are not taken into account.

### 34.2.2 Actions for data storage

Evacuation of data to data storage.

#### 34.2.2.1 Archive data

Archives for which the **Data Storage** has been selected for evacuation are evacuated to the **Data Storage**.
In doing so, the following applies:

- Variable values and lots can be evacuated.
- Evacuated variable values and lots can be restored.
- Local archive files are only deleted after successful evacuation.
- Variable values can be refreshed after evacuation.
- All actions for evacuation, restore, or refresh are delayed until the writing of the current project's metadata was successful.
  Writing of the metadata is attempted when the first action is started after:
  - Connection of the **Service Grid Gateways** to the Service Grid
  - Reloading of the current project
  - The reloading of a project that contains at least one variable that is used in an archive with evacuation to the **Data Storage**
  - A time overrun of 30 seconds if the previous attempt to write metadata has failed
- If the writing of the metadata has failed, all actions for evacuation, restoring or refreshing are canceled with an error until the writing of the metadata is attempted again.

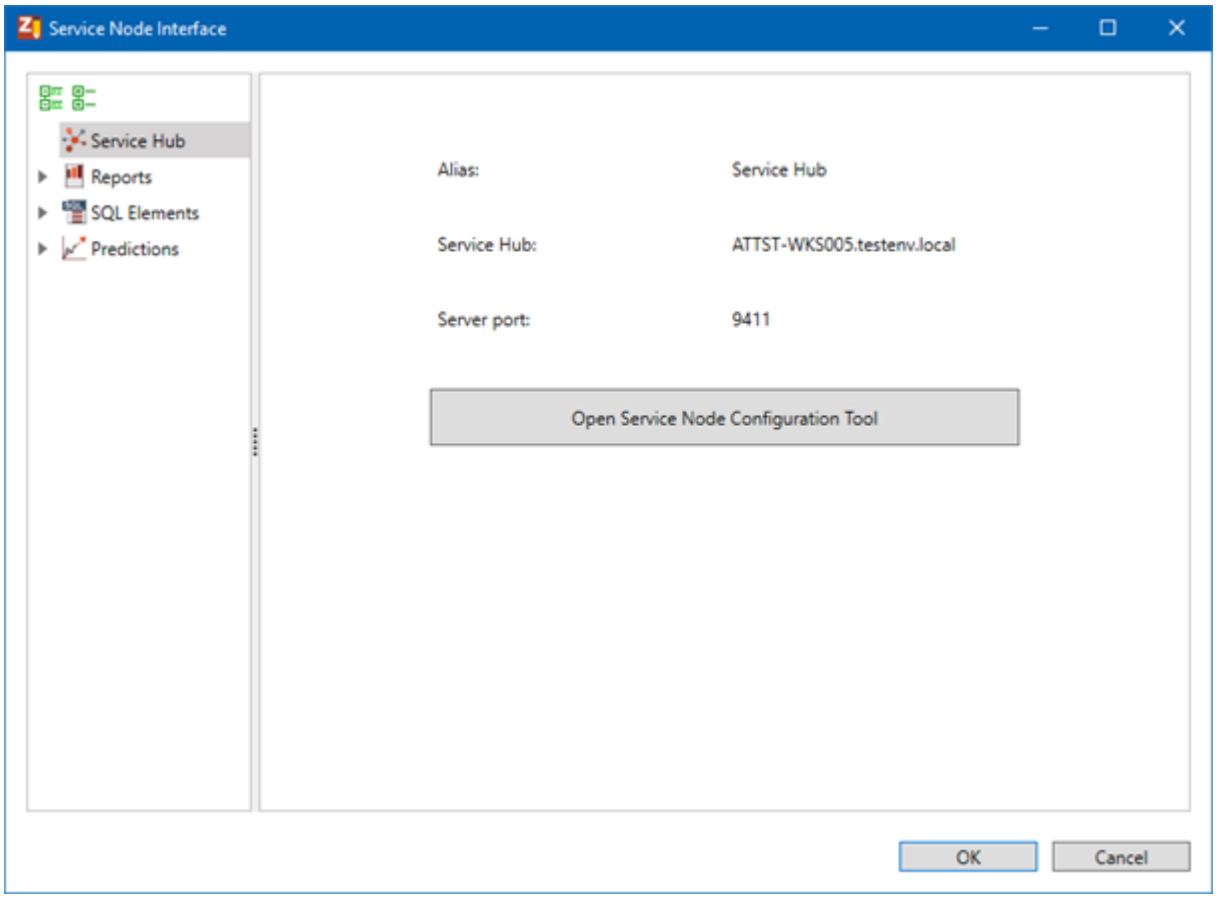
# 35 Service Grid configuration

To use the Service Grid, you must configure according to requirements:

- **Configuration backend**: Users, connections and applications.
- **zenon Editor** (on page 590): Configuration of the connection in zenon.
- Hubs: **Hub Controller**, **Data Hub**, Service Hub
- **Service Node** (on page 595)
- **zenon Runtime**: zenon devices that provide data.
- **zenon Analyzer**: Configuration for zenon Analyzer.

# 36 Analyzer Service Node Interface

The **Analyzer Service Node** forms the interface to the Analyzer server of the **Service Hub** in the Service Grid. It is configured in ZAMS.



zenon Analyzer provides other prosumers with **Analyzer Service Node** reports, SQL elements and prediction models.

The **Service Node Interface** is used for the following:

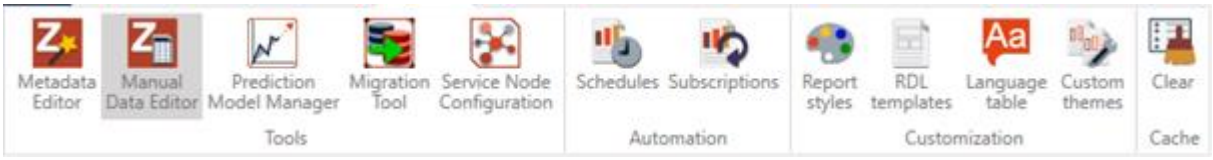
- Display of the **Service Hub** to which the Analyzer Service Node connects. The **Service Node Configuration Tool** can be started directly to configure the connection.
- Configuration of reports that are provided via the **Service Grid** and can be executed.
- Configuration of schedules for reports. These are automatically executed on the **Analyzer Service Node**.
  The **Service Grid** or another **Service Node** can use the **Service Hub** to call up which schedules are currently running on the **Analyzer Service Node** and subscribe to one or more schedules. If a schedule has been subscribed to, the requesting **Service Node** is sent the results from the executed schedule.
- Configuration of SQL elements that are provided and can be executed via the **Service Grid**: Stored Procedures, Scalar User Defined Functions, Table Valued Functions.

**Note:** A service (on page 601) that monitors the configuration of the **Analyzer Service Node** runs on the Analyzer Server. The **Service Node Interface** can only be configured if ZAMS is executed on the same computer as the Analyzer server.

## 36.1 Start and set parameters for service node interface

To start the **Service Node Interface**:

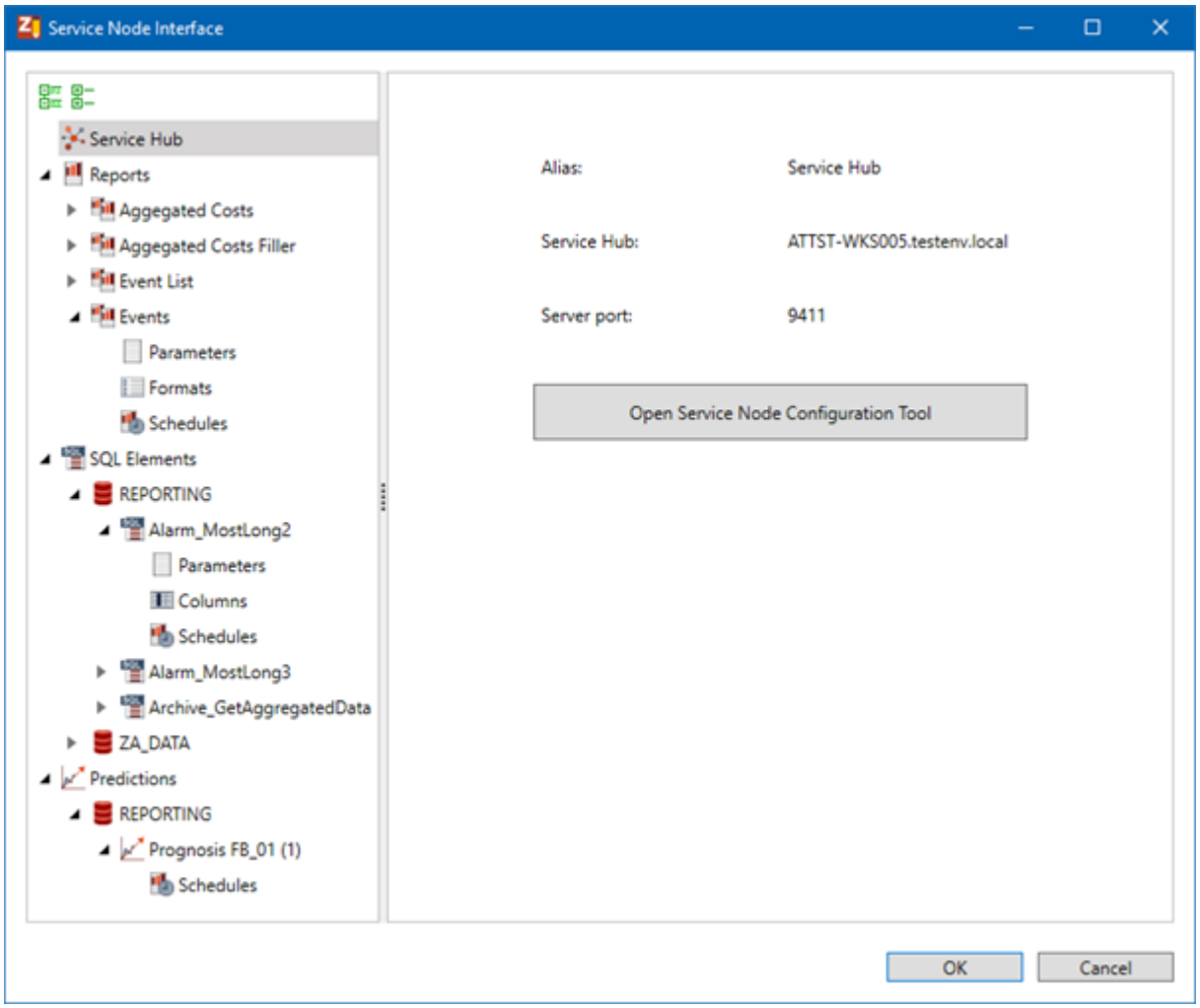
1. Navigate to the **Options** ribbon in ZAMS.




2. In the **Tools** section, click on the **Service Node Interface** entry.
   **Note:** The entry is only active if ZAMS is executed on the same computer as the Analyzer server and is connected to a database.

   The dialog for configuration is opened When opening, all existing and required information is loaded. A progress bar is shown in the progress.

## SERVICE NODE INTERFACE DIALOG




| Option | Description |
|---|---|
| **Object tree** | Lists the objects to be configured:<br>▸ **Service Hub** (on page 604): Display of the connection to the **Service Hub**.<br>▸ **Reports** (on page 610): Configuration of the reports that the **Analyzer Service Node** provides.<br>▸ **SQL elements** (on page 623): Configuration of the SQL elements that the **Analyzer Service Node** provides.<br>▸ **Predictions** (on page 637): Configuration of the prediction models that the **Analyzer Service Node** provides.<br>Objects that still need to be configured or contain errors |

| Option | Description |
|---|---|
| | are displayed with a red border.<br><br>The objects subordinated to the main nodes can be expanded or collapsed using the symbols at the header of the column. Individual nodes are expanded or collapsed with a mouse click on the node.<br><br>For configuration, select the respective objects and configure them. Clicking on the **OK** button accepts all configurations and closes the dialog. |
| **Configuration window** | Detail view and configuration of the selected objects. |

#### CLOSE DIALOG

| Option | Description |
|---|---|
| **OK** | Applies settings and closes the dialog.<br><br>Changes are saved locally and provided in the **Service Hub**. |
| **Cancel** | Discards all changes and closes the dialog. |

**Note:** The **OK** and **Cancel** buttons are always applicable for the complete dialog, not for individual objects. They are no longer documented separately when describing the configurable objects. When closing the dialog, a request for confirmation appears, which points out that there are unsaved changes.

### 36.1.1 Sort, filter and group lists

Lists in the dialog can be displayed as sorted, filtered and grouped.

#### SORT LIST

To sort a list:

1. Click in the header of the column according to which sorting is to take place.
2. Click again to change the sorting.

   Three sorting processes are gone through in sequence:

   - *Ascending*: The list is sorted from *0 - 9* and from *a - z*.
     Display with arrow pointing upwards.

- *Descending*: The list is sorted from *9 - 0* and from *z - a*
  Display by the arrow upwards.
- *Unsorted*: The list is displayed in the original status, i.e. as it was created.

## FILTER LIST

To filter a list:

1. Click on the filter symbol in the filter line.

   The filter dialog is opened.
2. Configure the filter.
3. Click on the **Filter** button.

   The filter is applied to the list.

To remove the filter again:

1. Open the filter dialog.
2. Click on the **Remove filter** button.

### FILTER OPTIONS

| Option | Description |
|---|---|
| **Option** | Entry of the character sequence that is to be filtered for. |
| **aA** | Switches between:<br>- *Capitalization is not taken into account*<br>- *Capitalization is taken into account*<br>Default: *Capitalization is not taken into account* |
| **Select all** | - Active: Selects all existing elements. |
| **[Report name]** | Selection of individual elements that are applied to the filter. Selection by activating the checkbox in front of the element names. |
| **Show lines with the following value** | Configuration of the selection by setting the following criteria. |
| **Criterion** | First criterion that is applied.<br>- Selection of the condition from the drop-down list.<br>- Entry of the criterion in the text field. |

| Option | Description |
|---|---|
| | For criteria, see the **Criteria** section. |
| **Linkage** | Linking to a second criterion.<br>Select from drop-down list:<br>▸ *and*: Both criteria must be applicable.<br>▸ *or*: One of the two criteria must be met. |
| **Criterion** | Second criterion that is applied and is linked to the first criterion.<br>▸ Selection of the condition from the drop-down list.<br>▸ Entry of the criterion in the text field.<br>For criteria, see the **Criteria** section. |
| **Filter** | Clicking on the button applies filter criteria to the list. |
| **Remove filter** | Removes all filter criteria. All lines are displayed again. |

### CRITERIA

The following are available as criteria for filter expressions:

| Criterion | Description |
|---|---|
| *Equals* | All entries with precisely the character sequence entered are displayed. |
| *Is not the same as* | All entries that do not precisely correspond to the character sequence entered are displayed. |
| *Starts with* | All entries that start with the character sequence are displayed. |
| *Ends with* | All entries that end with the character sequence are displayed. |
| *Contains* | All entries that contain this character sequence are displayed. (Default setting.) |
| *Does not contain* | All entries that do not contain this character sequence are displayed. |
| *Is empty* | All empty entries are displayed.<br>**Note:** Language tables must not contain empty cells for existing key words. |

| Criterion | Description |
|---|---|
| *is not empty* | All entries that contain at least one character are displayed. Spaces are also considered characters. |

### GROUP LIST

To group a list:

1. Click on the header of the column according to which the list is to be grouped.
2. Drag the header of the column to the grouping line, with the mouse.

   The list is shown accordingly grouped:
3. Add further grouping columns if required.

To remove the grouping:

1. Move the mouse over the grouping element in the grouping column.
2. Click on the **X** next to the column name or drag the element from the grouping line.

   The grouping is removed.

## 36.1.2 Windows service for Analyzer Service Node

For the configuration and use of the **Analyzer Service Node**, the associated Windows service must be running. This is installed and configured automatically during the installation of the Analyzer Server. The service monitors the configuration of the **Analyzer Service Node** for changes.
Availability and status are displayed using a symbol in the system tray of the Windows taskbar (on page 601). A dialog with actions and LOG entries can thus be opened.

### 36.1.2.1 Monitoring of service node status

Availability and status of the Window service for the **Analyzer Service Node** are displayed using a symbol in the system tray of the Windows taskbar. The **Service Node Status** dialog with actions and log entries can thus be opened.

The symbol visualizes the status of the service:

- Service was not found: The executable file has not been registered.
- Service is stopped: The service can be started via the **Service Node Status** dialog.
- The service is running.

The status is updated every second and when commands to administer the service are executed.
If the mouse is moved over the symbol, a tooltip with the current status is shown.

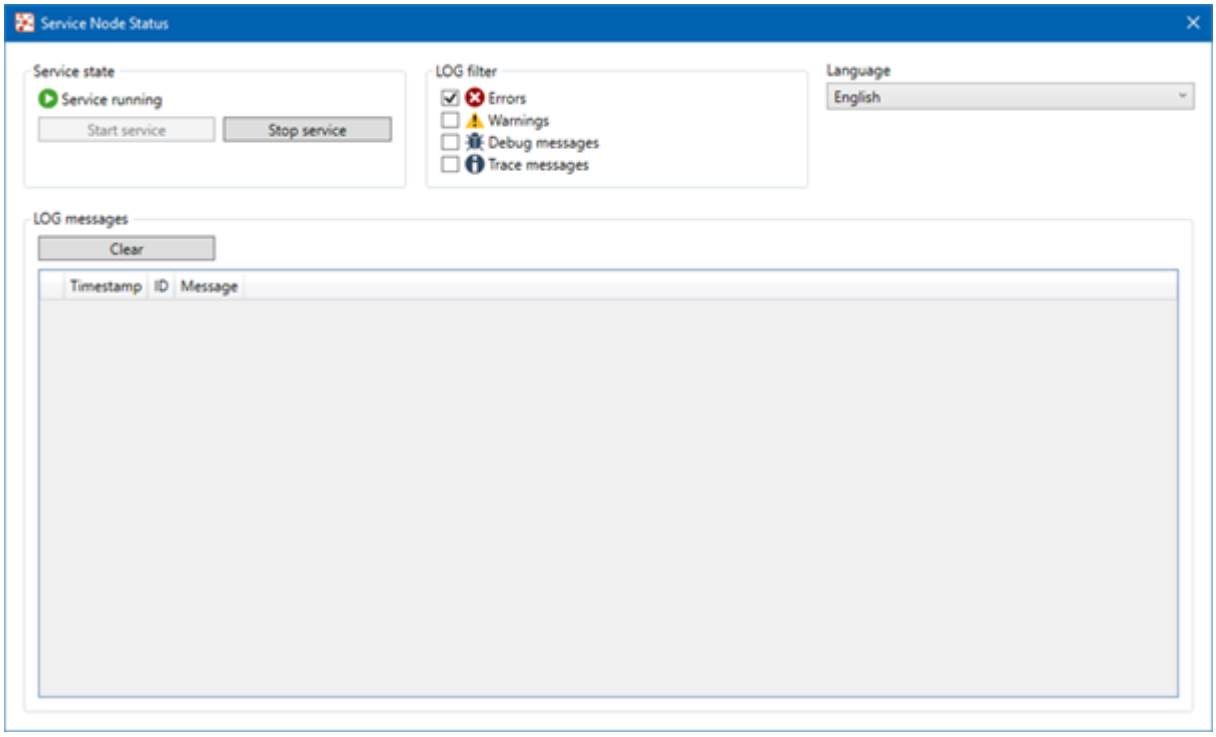
## SERVICE NODE STATUS CONTEXT MENU

Right-clicking on the symbol for **Service Node Status** opens a context menu.
Available actions:

- **Start service**: Starts the service.
  Only available if the service has been found and has been stopped.
- **Stop service**: Stops the service.
  Only available if the service has been started.
- **Display**: Opens the **Service Node Status** dialog.
- **Exit**: Ends the monitoring of the **Service Node status**.

## SERVICE NODE STATUS DIALOG

Double-clicking on the symbol opens the **Service Node status** dialog.




| Option | Description |
|---|---|
| **Service status** | Display of the status for the **Service Node**. |
| **Start service** | Click on the button to start the service.<br>Only available if the service has been found and has been stopped. |
| **Stop service** | Click on the button to stop the service.<br>Only available if the service has been started. |

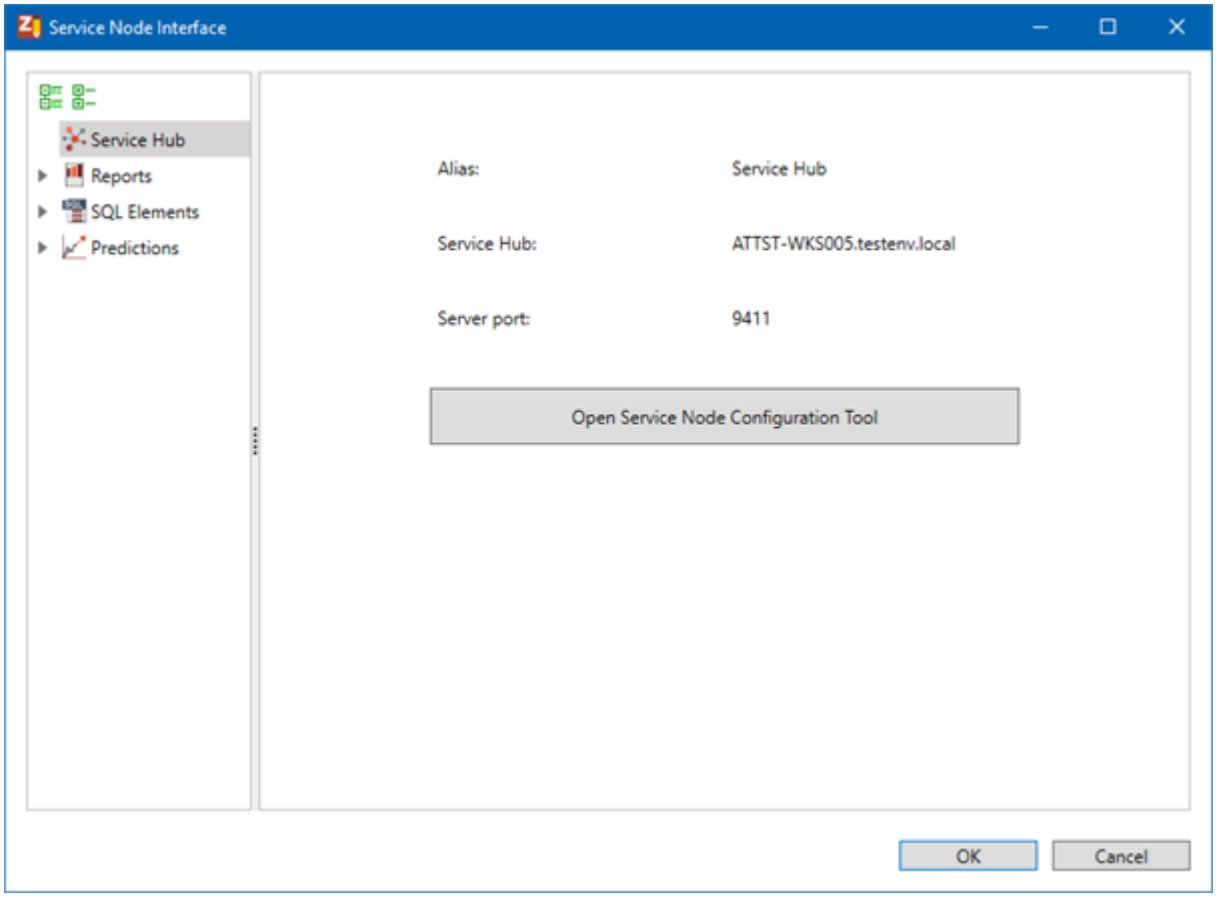
| Option | Description |
|---|---|
| **LOG filter** | Configuration of which log messages are displayed.<br>Select or deselect a level by clicking in the checkbox in front:<br>▸ **Error**<br>▸ **Warnings**<br>▸ **Debug messages**<br>▸ **Trace messages** |
| **Language** | Selection of the language for dialog and symbol in the info area from a drop-down list.<br><br>Default: *English* |
| **LOG messages** | Display of the LOG messages according to the configuration of the **LOG filter** option.<br><br>A maximum of 1000 messages are displayed. If this number is reached, the oldest ones are moved on each restart.<br><br>Columns for:<br>▸ Symbol with display of the level. Corresponds to the display in the **LOG filter** option. This column cannot be sorted.<br>▸ Time stamp:<br>Shows the time stamp of a message.<br>Format: *yyyy-MM-dd HH:mm:ss.fff*<br>The column is initially sorted in descending order. The most recent messages are thus shown at the top.<br>▸ Message ID: ID of the message.<br>▸ Message: Contains the text of the message. Texts are not translated. Service messages are generally in English. Operating system messages are generally in the current language of the operating system.<br><br>All columns, with the exception of the Symbol column, can be sorted. |
| **Delete** | Removes the buffered LOG messages. |

To close the dialog, click on the **X** in the top right corner. The application continues to run and is displayed in the info area as a symbol.

## 36.2 Connection to the service hub

To provide objects in the **Service Node**, a connection to the **Service Hub** must be established.

The currently configured connection is displayed in the **Service Hub** section:.




The connection data is displayed

| Option | Description |
|---|---|
| **Alias** | Alias for the configured **Service Hub**. This is saved locally by the **Service Node Configuration Tool**. |
| **Service Hub** | URL of the **Service Hub**. |
| **Serverport** | port number of the **Service Hub.** |
| **Service Node Configuration Tool open** | To change the connection, start the **Service Node Configuration Tool** (on page 605) and select the desired **Service Hub** there. |

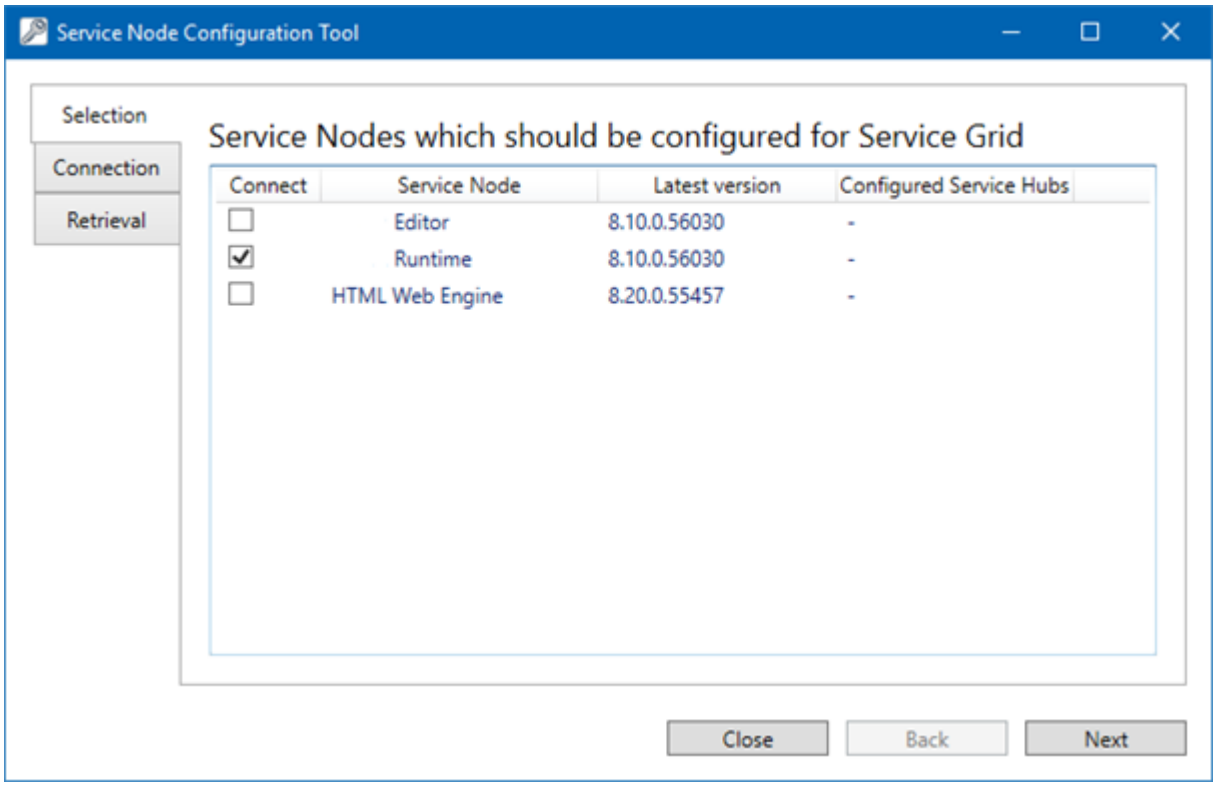
## 36.2.1Dialog: Service Node Configuration Tool

The user interface of the **Service Node Configuration Tool** is divided into three tabs:

- **Selection**
- **Connection**
- **Retrieval**

### SELECTION

Here you can configure the **Service Nodes** that are to be connected to the **Service Hub**.




| Column | Description |
|---|---|
| **Connect** | Selection of the **Service Nodes** that are to be connected to the **Service Hub** .<br><br>Click the checkbox to select the respective **Service Node** for the following steps. |

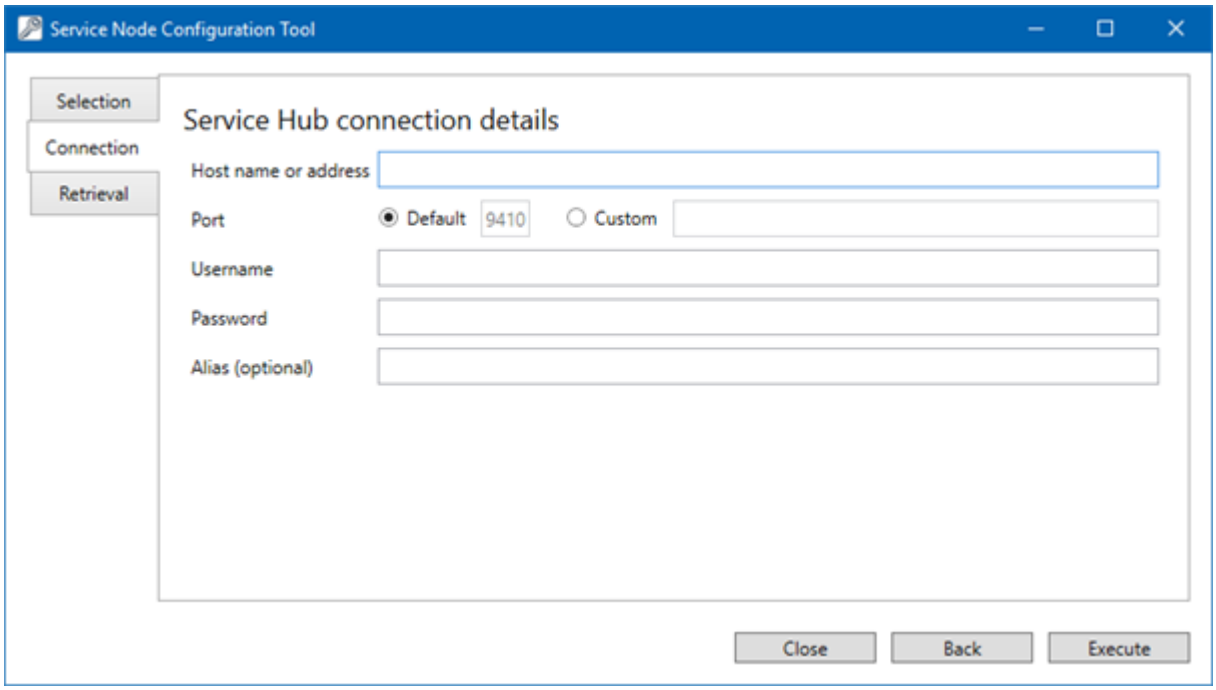
| Column | Description |
|---|---|
| **Service Node** | Display of the installed **Service Nodes** that can be connected to the **Service Hub**.<br><br>**Note:** The following is applicable for zenon Runtime or zenon Editor:<br>▸ **zenon Runtime**: Two Certificate Bundles are created, one for the Runtime and one for the Runtime Add-In.<br>▸ If a Runtime or the Editor are selected, Certificate Bundles are also created for the Predicitve Analytics driver and the SERVICEGRID driver. |
| **Latest version** | Display the current version number of the **Service Node**. |
| **Configured Service Hubs** | Display the previously configured connections for the **Service Node**. |

### NAVIGATION

| Option | Description |
|---|---|
| **Close** | Closes the dialog. Changes that have not been saved are lost. |
| **Back** | Goes back one tab.<br><br>Not available for **Selection**. |
| **Next** | Moves one step forward to **Connection**.<br>Only available if at least one Service Node has been selected. |

## CONNECTION

Here you can configure the connection to the **Hub Controller**.




| Option | Description |
|---|---|
| **Host name or address** | Address at which the **Hub Controller** can be contacted. Input as IP address or host name.<br><br>at least have to have 1 character |
| **Port** | Selection of the port at which the **Hub Controller** can be contacted:<br>▸ **Default**: The port selected by the system is used. Default: *9410*<br>▸ **Custom**: The port selected by the user is used. Entry of the port number in the field. Permitted values: *1* to *65535*. **Note:** Make sure that the user-defined port is not blocked by the firewall. |
| **Username** | Entry of the user name for the **Hub Controller**. Must contain at least 1 character. |
| **Password** | Entry of the password for the **Hub Controller**. Must contain at least 1 character. |

| Option | Description |
|---|---|
| **Alias** | Optional entry of an alias for the **Service Node**.<br><br>This is used, for instance, by the zenon Editor or zenon Analyzer to make it easier for the user to distinguish between the configured connections later on. |

### NAVIGATION

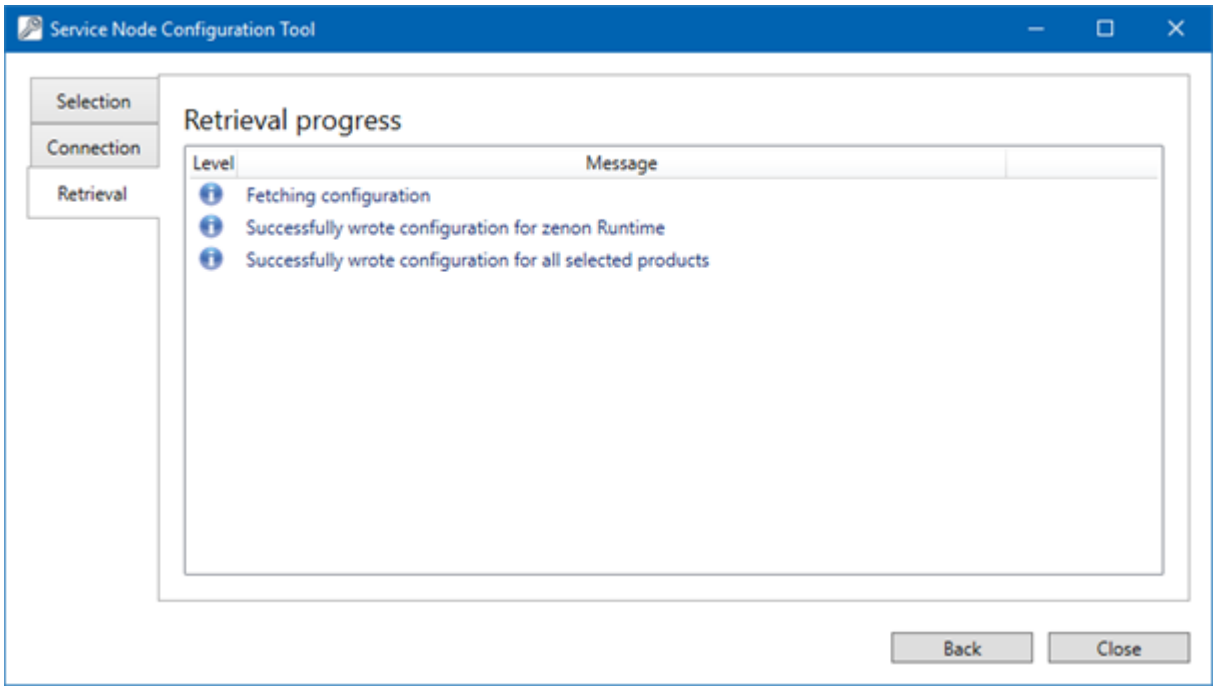
| Option | Description |
|---|---|
| **Close** | Closes the dialog. Changes that have not been saved are lost. |
| **Back** | Goes back one tab. |
| **Execute** | Checks the entered connection parameters and starts the configuration of the previously selected **Service Nodes**. |

## RETRIEVAL

The credentials for the selected **Service Nodes** are requested and configured here.

All the steps performed are listed.

The successful configuration of the **Service Nodes** and any problems that occur are also displayed. The messages in the window can be highlighted and copied.



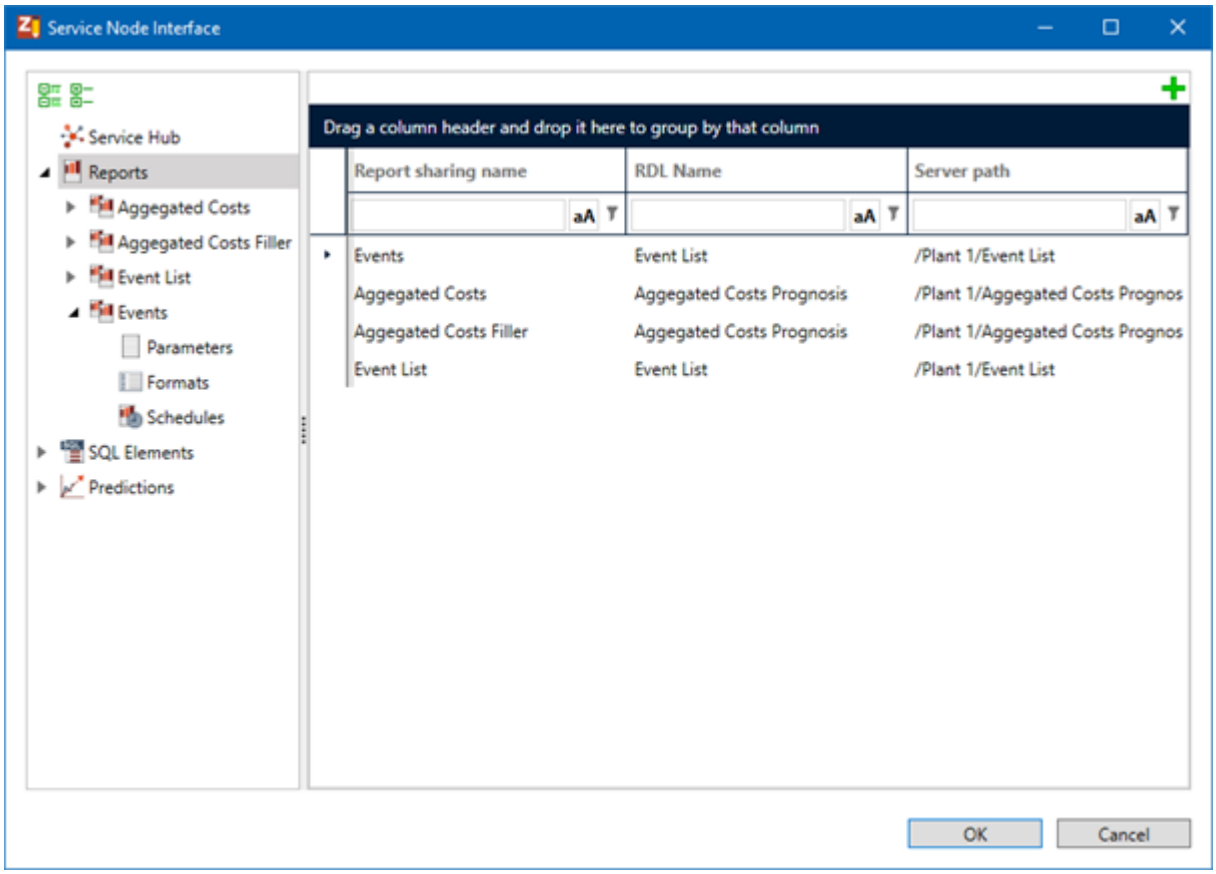
| Column | Description |
|---|---|
| **Level** | Uses a symbol to show the type of message that is displayed. |
| **Message** | Information on the individual steps performed.<br>All information can be copied from the window. |

### NAVIGATION

| Option | Description |
|---|---|
| **Back** | Goes back one tab.<br>Not available for **Selection**. |
| **Close** | Closes the dialog. |

## 36.3 Reports

Display of the configured reports and addition of new reports for the **Service Grid**.
Existing reports are administered in the subordinate objects.




| Options | Description |
|---|---|
| + | Clicking on the button opens the dialog to select a report. |
| **List of reports** | Displays all reports available in the **Analyzer Service Node**. |

### ADD REPORT

To add a report:

1. Click on the + symbol in the top right corner of the dialog.

   The selection dialog is opened.
   Only reports that can be provided via the **Service Grid** are displayed. Reports with shifts or lots are not available.

2. Select the desired report.

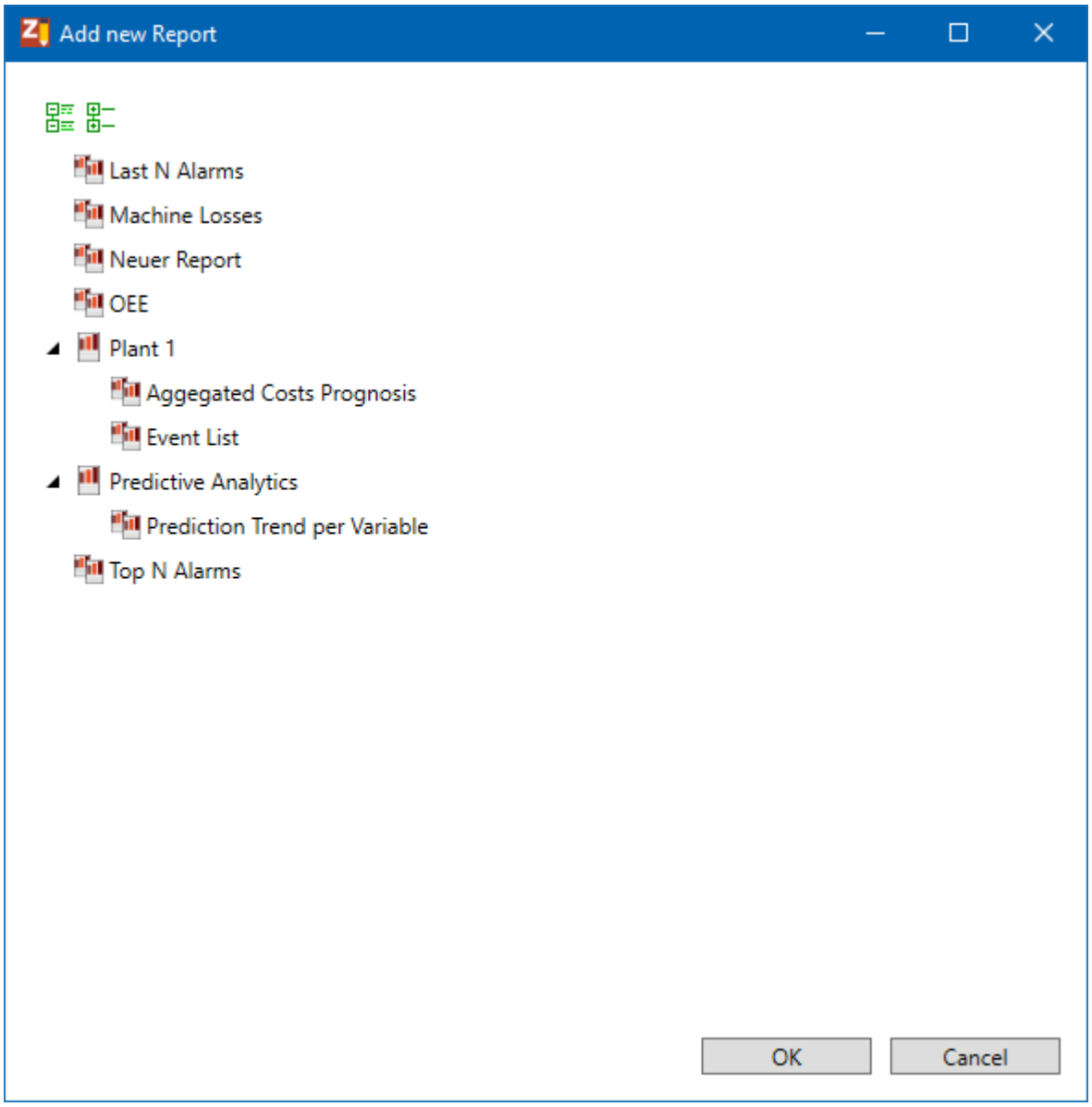
3. Click on **OK**.

   The report is added to the list and displayed.

4. Configure the report.
   Objects that need inputs are highlighted in red. In doing so, it is always the higher-level objects that are highlighted.

**Note:** The report is only saved in the configuration file and on the service hub if the **Service Node Interface** dialog has been saved and closed with **OK**.

### ADD NEW REPORT DIALOG



| Option | Description |
|---|---|
| **Collapse/expand symbol node** | The objects subordinate to the main nodes can all be displayed as expanded or collapsed.<br>Individual nodes are expanded or collapsed with a mouse click. |
| **List of reports** | Display of the reports present. Selection via mouse click. |
| **OK** | Applies selection, closes the dialog and enters the selected report into the list. |
| **Cancel** | Discards selection and closes the dialog. |

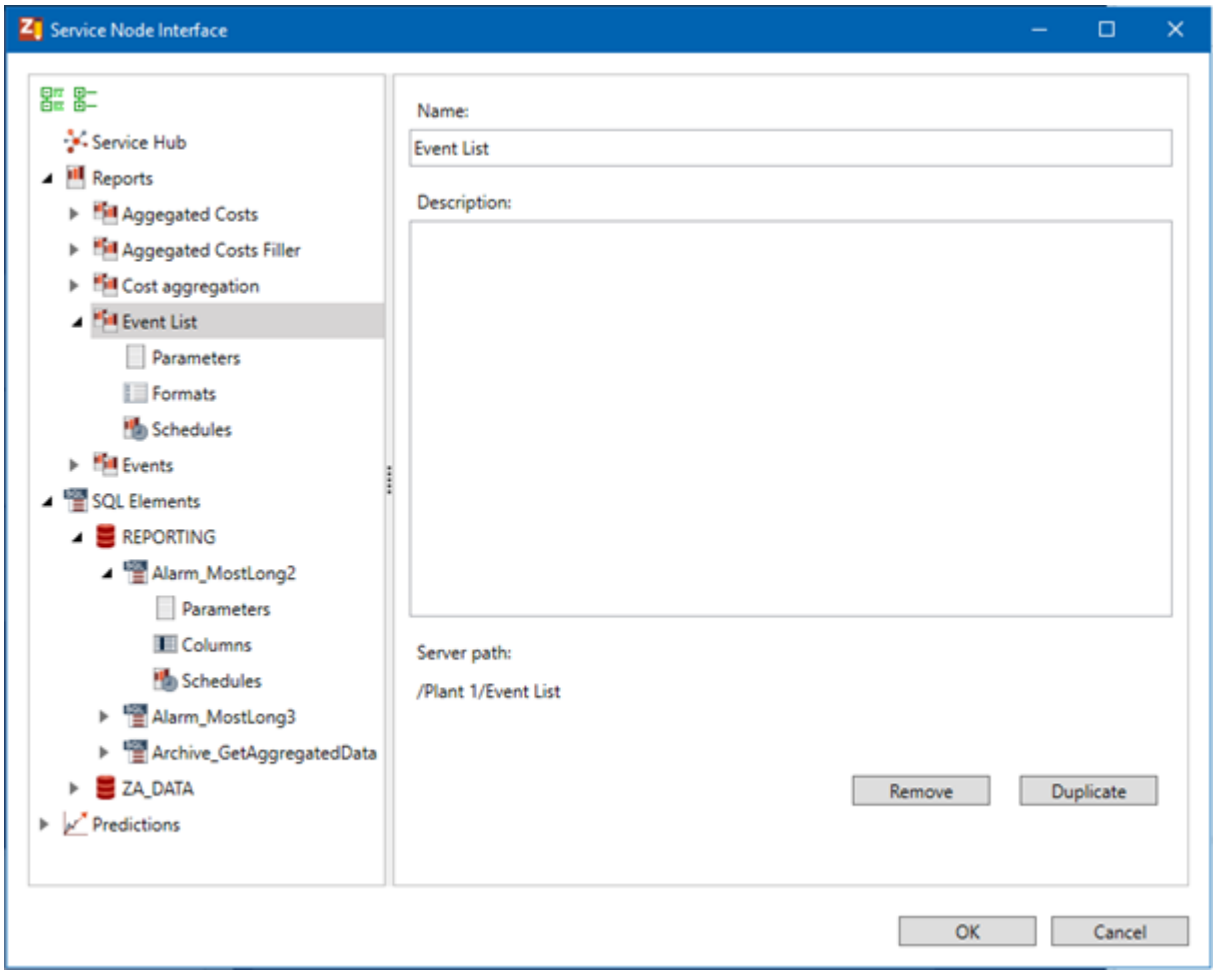
## 36.3.1Report

Display of a selected report.

You have the possibility:

- To amend the name and description.
- To duplicate reports and thus configure variants.
- To remove reports.
- To configure parameters (on page 615).
- To select formats (on page 616) for deployment.
- To create schedules (on page 617) for deployment.

## REPORT CONFIGURATION DIALOG




| Option | Description |
|---|---|
| **Name** | Name of the report.<br>Can be amended:<br>▸ Maximum *128* characters.<br>▸ Must be unique within the **Service Node**. |
| **Description** | Description of the report.<br>Can be amended:<br>▸ Maximum *256* characters. |
| **Server path** | Save location of the report.<br>Display only. |
| **Remove** | Clicking on the button removes the report from the |

| Option | Description |
| --- | --- |
| | list. |
| **Duplicate** | Clicking on the button creates a duplicate of the report.<br>The following is applicable for duplicates:<br>▸ Parameters and formats can be amended individually.<br>▸ The name must be changed. |

## CREATE AND CONFIGURE VARIANTS

To create a new report on the basis of a pre-existing report:

1. Select the report that is to serve as a basis.
2. Click on **Copy**.

   A duplicate of the report is added.
3. Change the name of the duplicate.
4. Configure parameters, formats and schedules.

## DELETE REPORT

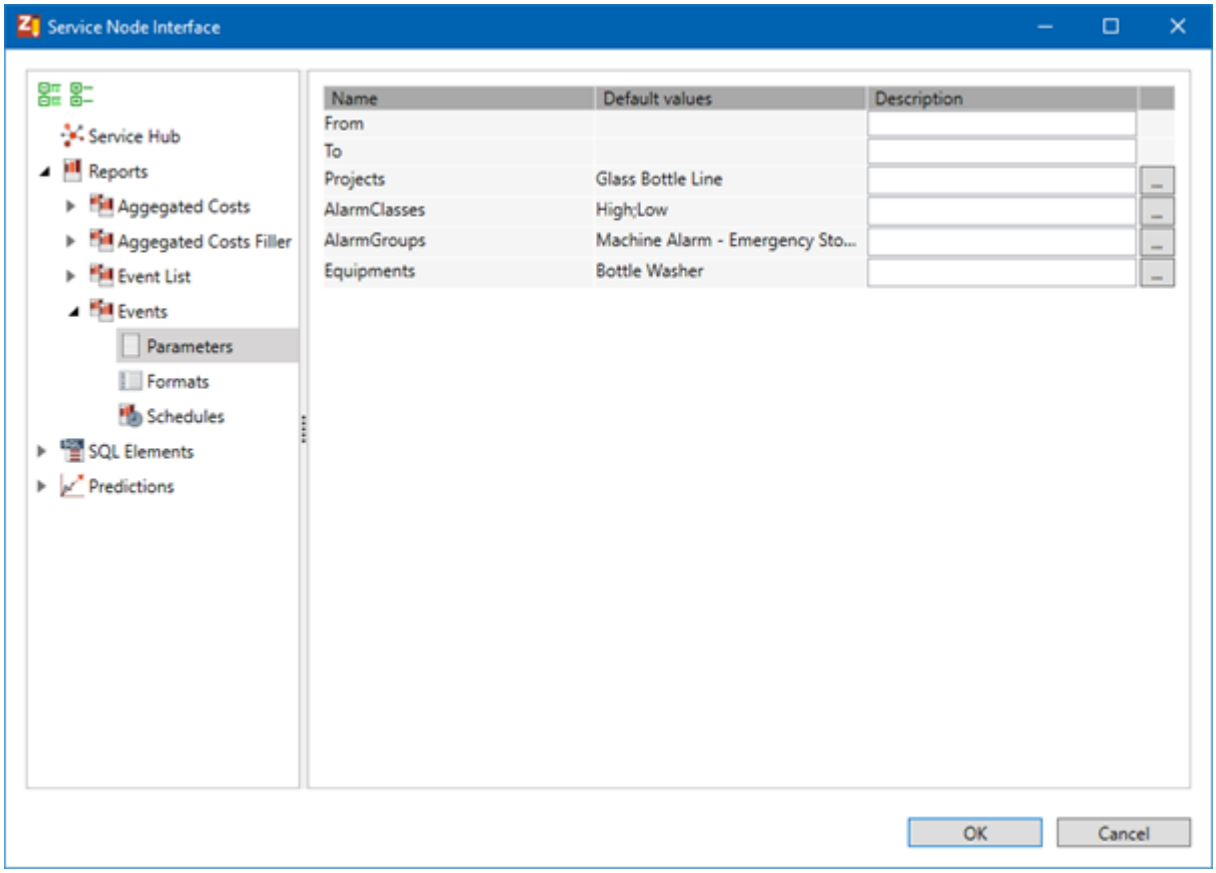
To remove a new report from the **Service Node Interface**:

1. Select a report in the left window.
2. Click on **Remove** in the detail view.

   The report is removed from the configuration.
3. To confirm the removal, close the **Service Node Interface** by clicking on **OK**.

## 36.3.2 Parameter

Configuration of the report parameters.




The parameters that are available depend on the report type. The parameters must be configured consecutively from top to bottom.

**Background:** Each time a parameter is set, a corresponding query is sent to the Analyzer Server. Only after a successful query can valid values be received for the following parameter.

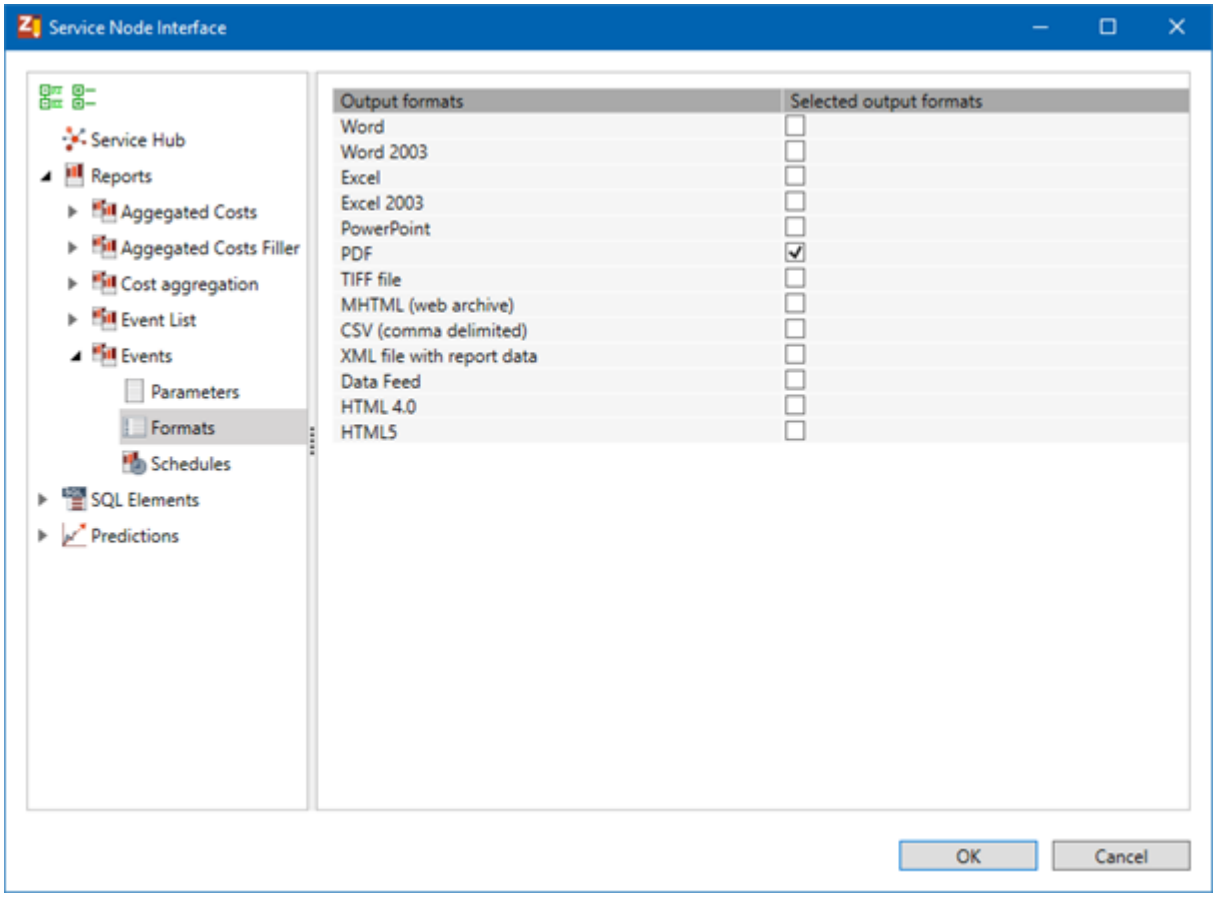
To configure parameters:

1. Start with the uppermost parameter.
   Except: Parameters for time.
2. Open the selection dialog by clicking on the **...** button and select the desired values.
3. Configure the following parameters consecutively until no more validation errors are displayed.
4. Enter a description for the respective parameter if required.

> **Attention**
>
> *Timespan* parameters and *Datetime* parameters are only displayed. These are set via the **Service Grid** API when requesting a report.

## 36.3.3 Formats

Selection of the output formats in which the report is to be prepared.




To select output formats:

1. Activate the checkbox behind each desired format.
   These are then available in the schedule.
   **Note:** Schedules can only be configured if at least one output format as been defined.
2. For each schedule, select the format in which the respective report is to be prepared.

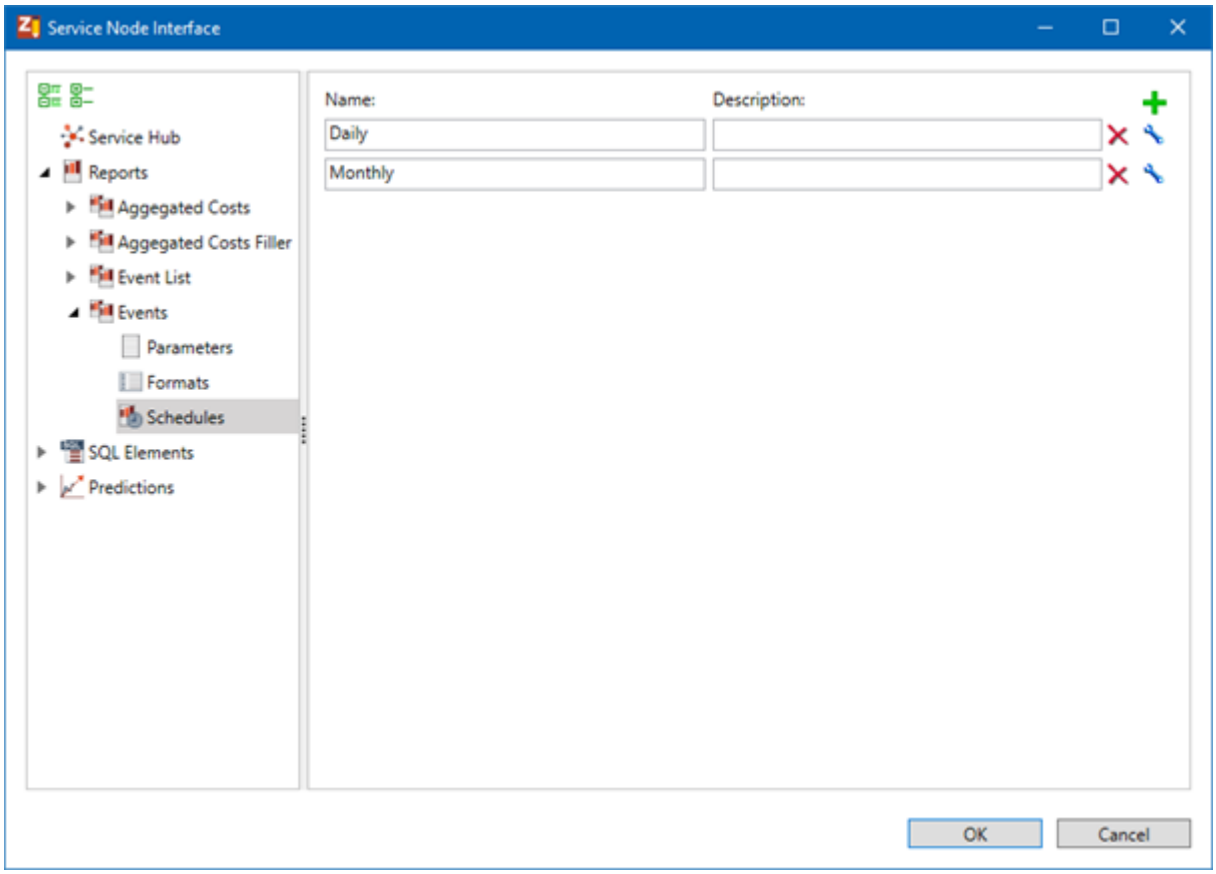
## 36.3.4 Schedules

Reports that have been prepared for the **Service Grid** can be executed automatically by means of a schedule. Each report has a **Schedules** node for this.

You can do the following here:

- Create new schedules
- Edit existing schedules
- Delete existing schedules

### SCHEDULES DIALOG




| Option | Description |
|---|---|
| **List of schedules** | Shows all configured schedules. |
| Symbol **+** | Clicking on the symbol opens the dialog to create and configure a schedule. |
| Symbol **X** | Clicking on the symbol deletes the selected schedule without a request for confirmation. |

| Option | Description |
|---|---|
| **Wrench** symbol | Clicking on the symbol opens the dialog to configure the selected schedule. |

## CREATE NEW SCHEDULE

To create a new schedule:

1. Click on the symbol **+**.

   The dialog for configuring the schedule (on page 644) is opened
2. Configure the schedule with:
   - **Schedule duration**
   - **Date of execution**
   - **Execution time**
   - **Parameters**
   - **Output format**
3. Confirm the configuration by clicking on **OK**.

   The schedule is entered into the list.
4. Please define a name!
   The name must be unique within the report.

## EDIT SCHEDULE

To edit a schedule:

1. Select the schedule.
2. Click on the symbol with the wrench symbol.

   The dialog for configuring the schedule is opened.
3. Configure the schedule.
4. Confirm the configuration by clicking on **OK**.

## DELETE SCHEDULE

To delete a schedule:

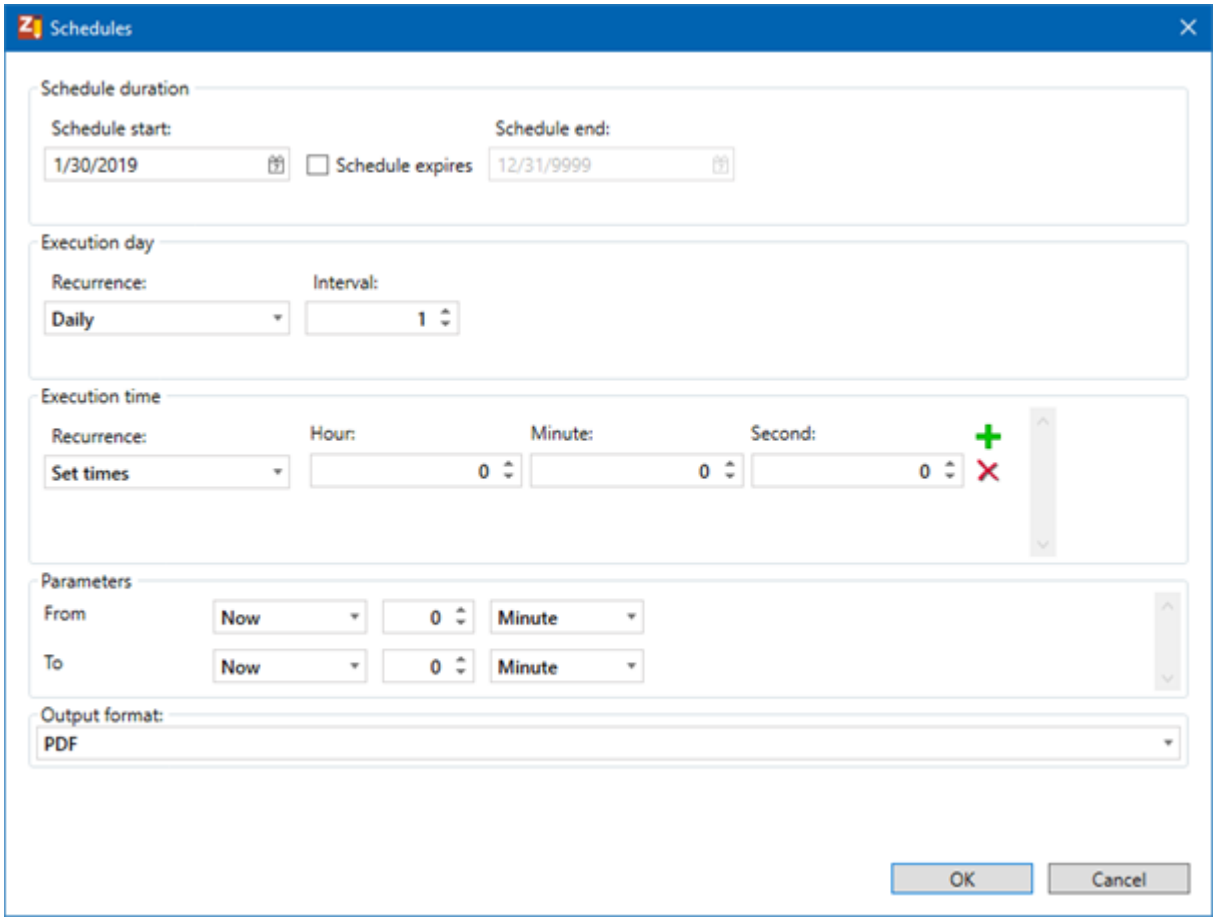
1. Select the schedule.
2. Click on the symbol **X**.

   The schedule is deleted.

## 36.3.4.1 Configure a schedule

Here you configure schedules for the preparation of reports with:

- Schedule duration
- Date of execution
- Execution time
- Parameter
- Output format




### SCHEDULE DURATION

Configuration of the time range for which the schedule is applied.

| Option | Description |
|---|---|
| **Schedule start** | Start time of the schedule. The schedule is valid |

| Option | Description |
|---|---|
| | from this point.<br><br>Entry in the field directly in the format *dd.mm.yyyy* or selection via calendar element. |
| **Schedule expires** | Configuration of whether the schedule has an expiry date.<br><br>▸ *Active*: Schedule has a defined end.<br>▸ *Inactive*: Schedule is always valid from the start time.<br><br>Default: *inactive* |
| **Schedule end** | End time of the schedule. The schedule is invalid from this point.<br><br>Entry in the field directly in the format *dd.mm.yyyy* or selection via calendar element. |

### DATE OF EXECUTION

Configuration of the days on which the schedule is executed.

| Option | Description |
|---|---|
| **Recurrence** | Selection of the recurrence configuration from drop-down list:<br><br>▸ *Daily*<br>▸ *Weekly*<br>▸ *Monthly*<br><br>Default: *Daily* |
| **Interval** | Configuration of the intervals of the recurrence. Direct entry in the field or configuration using arrow keys.<br><br>▸ Minimum: *1*<br>▸ Maximum: *2147483647*<br><br>Default: *1* |
| **Weekday** | Configuration of the weekdays on which the schedule is executed. |

| Option | Description |
|---|---|
| | Selection by activating the checkbox in front of the day.<br>Default: *Monday*<br>**Note:** Only available for weekly recurrence. |
| **Day** | Configuration of the days in the month on which the plan is executed:<br>▸ Entry in the text field directly or configuration using the arrow keys. Minimum: *1* Maximum: *28*<br>▸ Addition of further days: Click on the **+** symbol.<br>▸ Deletion of days: Click on the **X** symbol.<br>**Note:** Only available for monthly recurrence. |

### EXECUTION TIME: STIPULATED TIMES

Configuration for schedules with fixed times of execution.

| Option | Description |
|---|---|
| **Recurrence** | Type of recurrence.<br>Must be set to *stipulated times*. |
| **Hour** | Entry of the hour.<br>Direct entry in the field or configuration using arrow keys.<br>▸ Minimum: *0*<br>▸ Maximum: *23*<br>Default: *0* |
| **Minute** | Input of the minute.<br>Direct entry in the field or configuration using arrow keys.<br>▸ Minimum: *0*<br>▸ Maximum: *59* |

| Option | Description |
|---|---|
| | Default: *0* |
| **Second** | Entry of the second.<br>Direct entry in the field or configuration using arrow keys.<br>▸ Minimum: *0*<br>▸ Maximum: *59*<br>Default: *0* |

### EXECUTION TIME: RECURRENCE PATTERN

Configuration for schedules with recurrence pattern.

| Option | Description |
|---|---|
| **Recurrence** | Type of recurrence.<br>Must be set to *recurrence pattern*. |
| **Interval** | Configuration of the intervals of the recurrence. Direct entry in the field or configuration using arrow keys.<br>▸ Minimum: *1*<br>▸ Maximum: Depending on unit:<br>Hour: *23*<br>minute: *1439*<br>second: *86399*<br>Default:*1* |
| **Time unit** | Selection of the scaling from a drop-down list:<br>▸ *Hour*<br>▸ *Minute*<br>▸ *Second*<br>Default: *Hour* |
| **Start time** | Definition of the start time via:<br>▸ **Hour**<br>▸ **Minute** |

| Option | Description |
|---|---|
| | ▸ **Second** |
| **End time** | Definition of the end time via:<br>▸ **Hour**<br>▸ **Minute**<br>▸ **Second** |

### PARAMETER

Configuration of the execution times.

| Option | Description |
|---|---|
| **From** | Selection of the start of the execution time from a drop-down list.<br>**Note:** Not available for prediction models with a **value count** of *1*. |
| **To** | Selection of the end of the execution time from a drop-down list.<br>**Note:** Not available for prediction models with a **value count** of *1*. |

### OUTPUT FORMAT

Configuration of the output format.

| Option | Description |
|---|---|
| **Output format** | Selection of the output format from a drop-down list:<br>All output formats (on page 616) configured in the **Formats** area are available here.<br>**Note:** Only available for reports. |

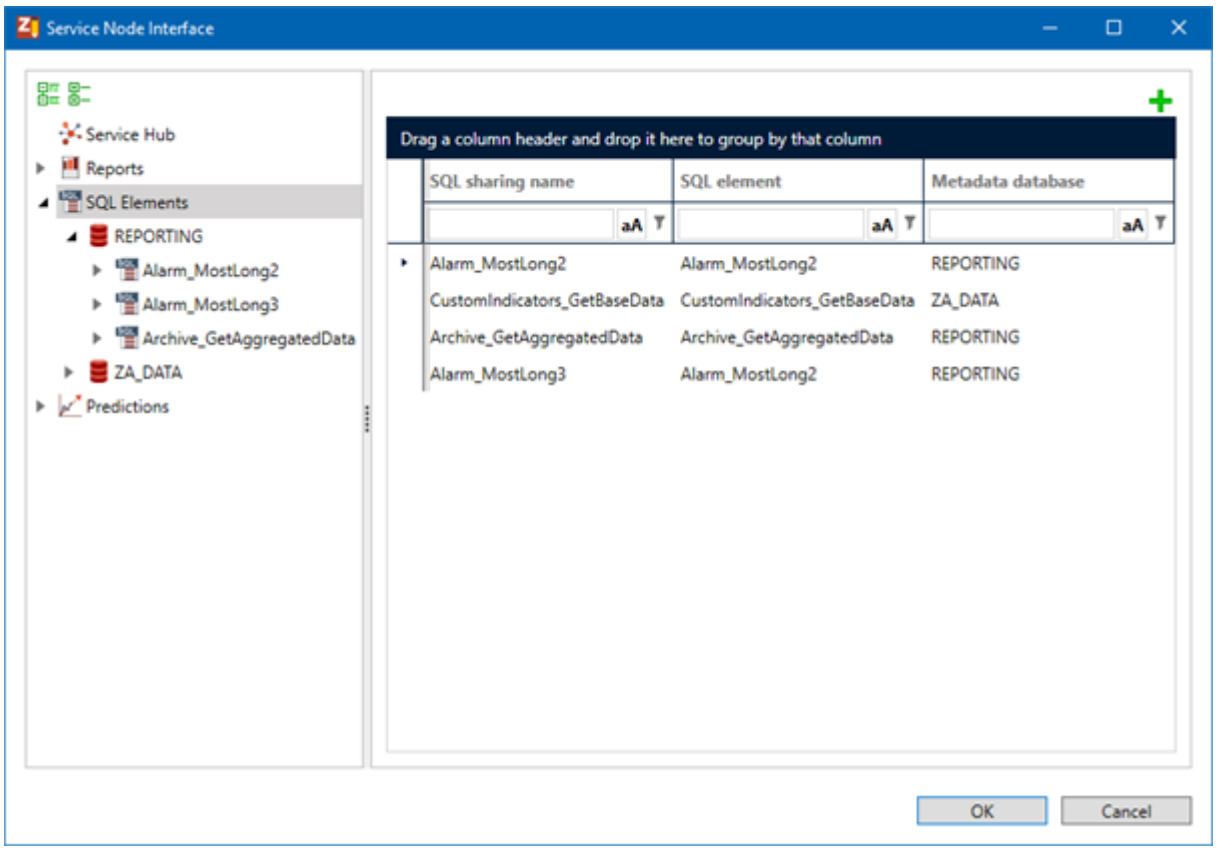
## 36.4 SQL elements

Display of the SQL elements to be configured for the **Service Grid** and addition of new SQL elements:

- Stored Procedures
- Scalar User Defined Functions
- Table Valued Functions

Existing SQL elements are administered in the subordinate objects.

**Note:** The SQL elements **System** and **zrs** are not available.




| Options | Description |
|---|---|
| + | Clicking on the button opens the dialog to select an SQL element. |
| **List of SQL elements** | Shows all SQL elements available in the **Analyzer Service Node**. |

## ADD SQL ELEMENT

To add an SQL element:

1. Click on the + symbol in the top right corner of the dialog.

   The selection dialog is opened.
2. Select the desired SQL element.

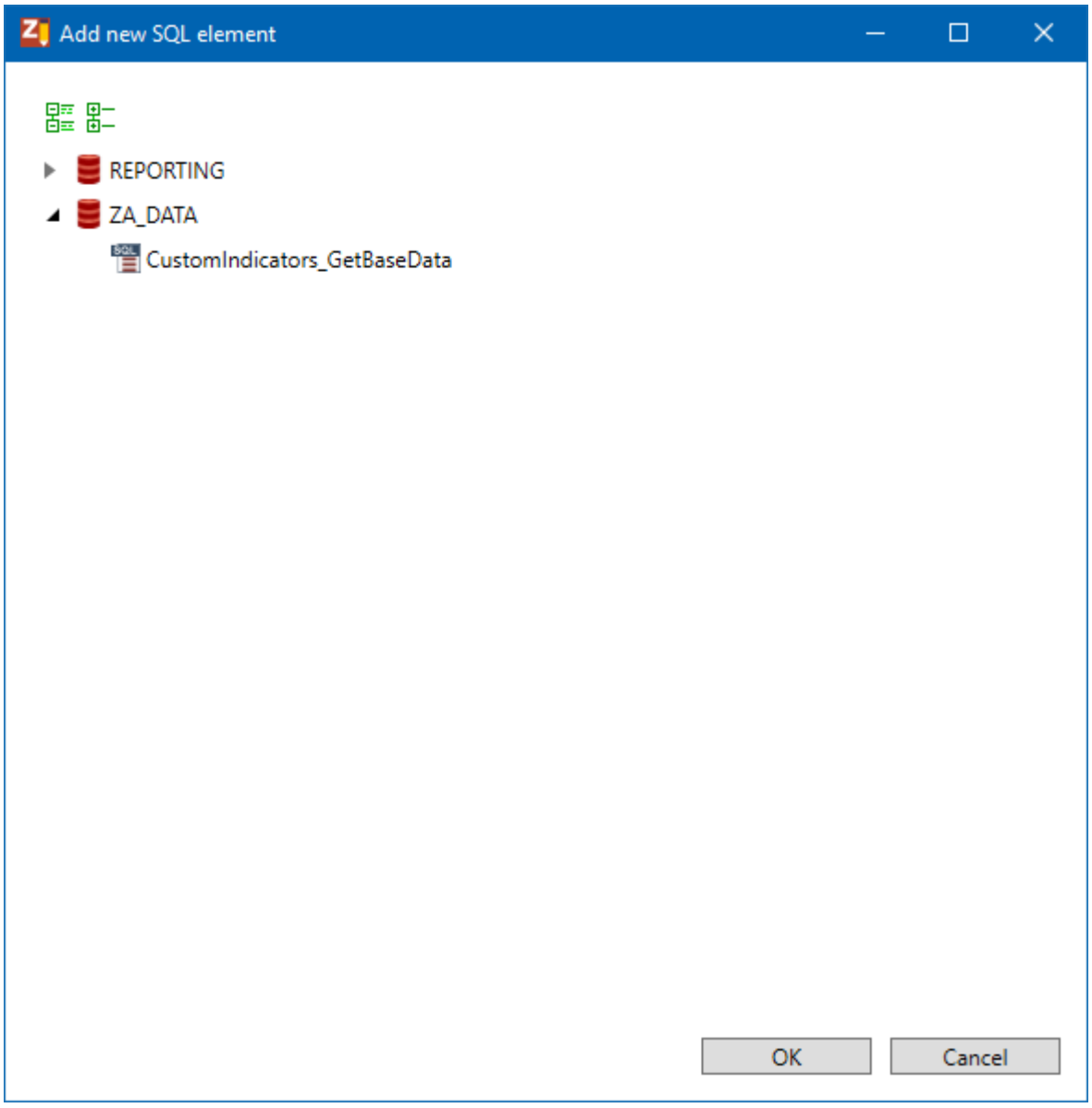
3. Click on **OK**.

   The SQL element is added to the list.

   Objects that require entries are highlighted in red. In doing so, it is always the higher-level objects that are highlighted.

**Note:** The report is only saved in the configuration file and on the service hub if the **Service Node Interface** dialog has been saved and closed with **OK**.

### ADD NEW SQL ELEMENT DIALOG




| Option | Description |
|---|---|
| **Collapse/expand symbol node** | The objects subordinate to the main nodes can all |

| Option | Description |
|---|---|
| | be expanded or collapsed.<br>Individual nodes can be expanded or collapsed by clicking with the mouse on the nodes. |
| **List of the SQL elements** | Display of the existing SQL elements. Selection via mouse click. |
| **OK** | Applies selection, closes the dialog and enters selected SQL element into the list. |
| **Cancel** | Discards selection and closes the dialog. |

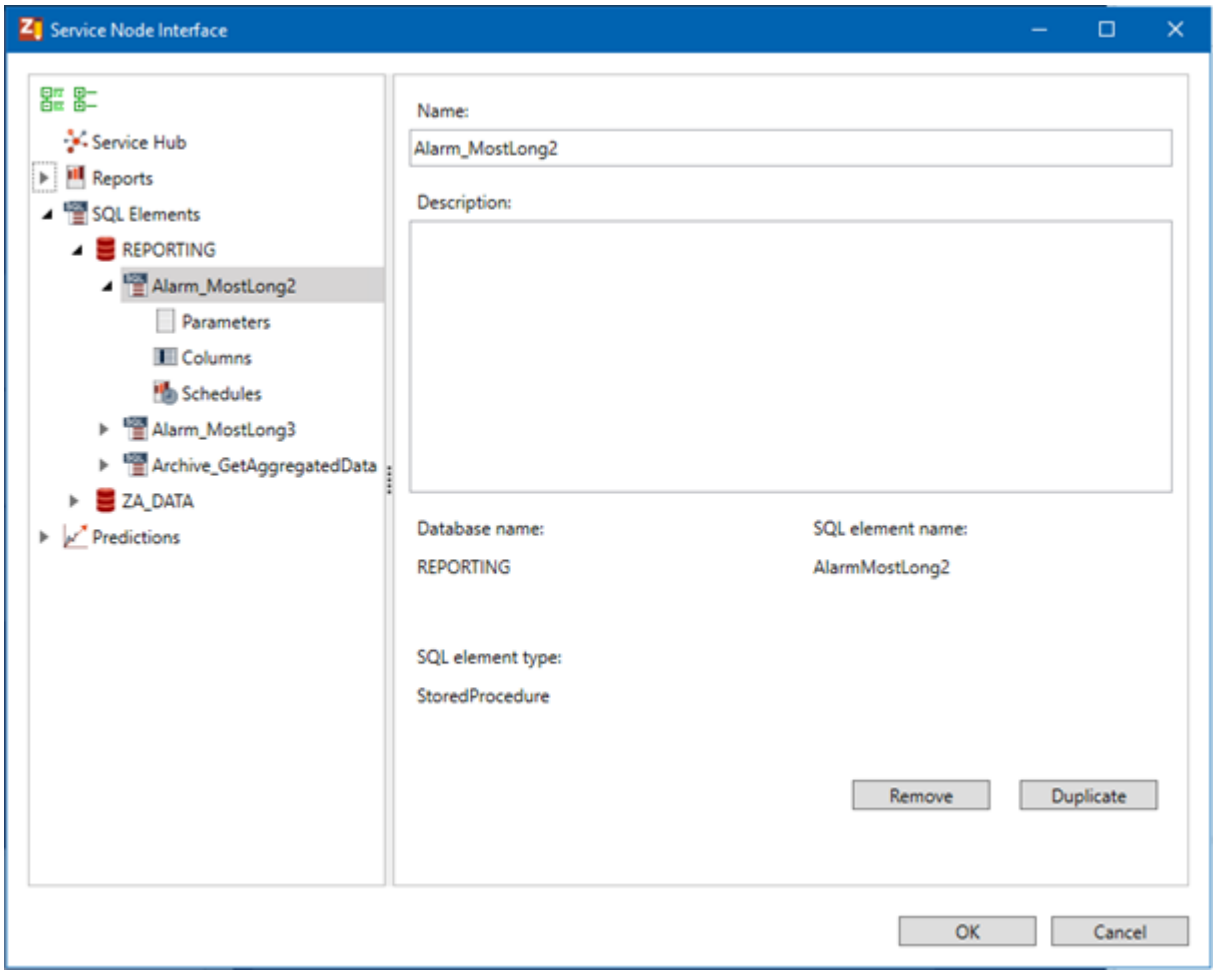
## 36.4.1SQL element

Display of a selected SQL element.

You have the possibility:

- To amend the name and description.
- To duplicate SQL elements and thus configure variants.
- To remove SQL elements.
- To configure parameters.
- To display the column configuration.
- To create schedules (on page 617) for deployment.

## CONFIGURE SQL ELEMENT DIALOG




| Option | Description |
|---|---|
| **Name** | Name of the SQL element.<br>Can be amended:<br>▸ Maximum *128* characters.<br>▸ Must be unique within the **Service Node**. |
| **Description** | Description of the SQL element.<br>Can be amended:<br>▸ Maximum *256* characters. |
| **Database name** | Name of the database from which the SQL element comes.<br>Display only. |

| Option | Description |
|---|---|
| **SQL element name** | Name of the SQL element.<br><br>Display only. |
| **SQL element type** | Type of the SQL element.<br><br>Display only. |
| **Remove** | Clicking on the button removes the SQL element from the list. |
| **Duplicate** | Clicking on the button creates a duplicate of the SQL element.<br>The following is applicable for duplicates:<br>▸ Parameters can be amended individually.<br>▸ The name must be changed. |

### CREATE AND CONFIGURE VARIANTS

To create a new SQL element on the basis of a pre-existing SQL element:

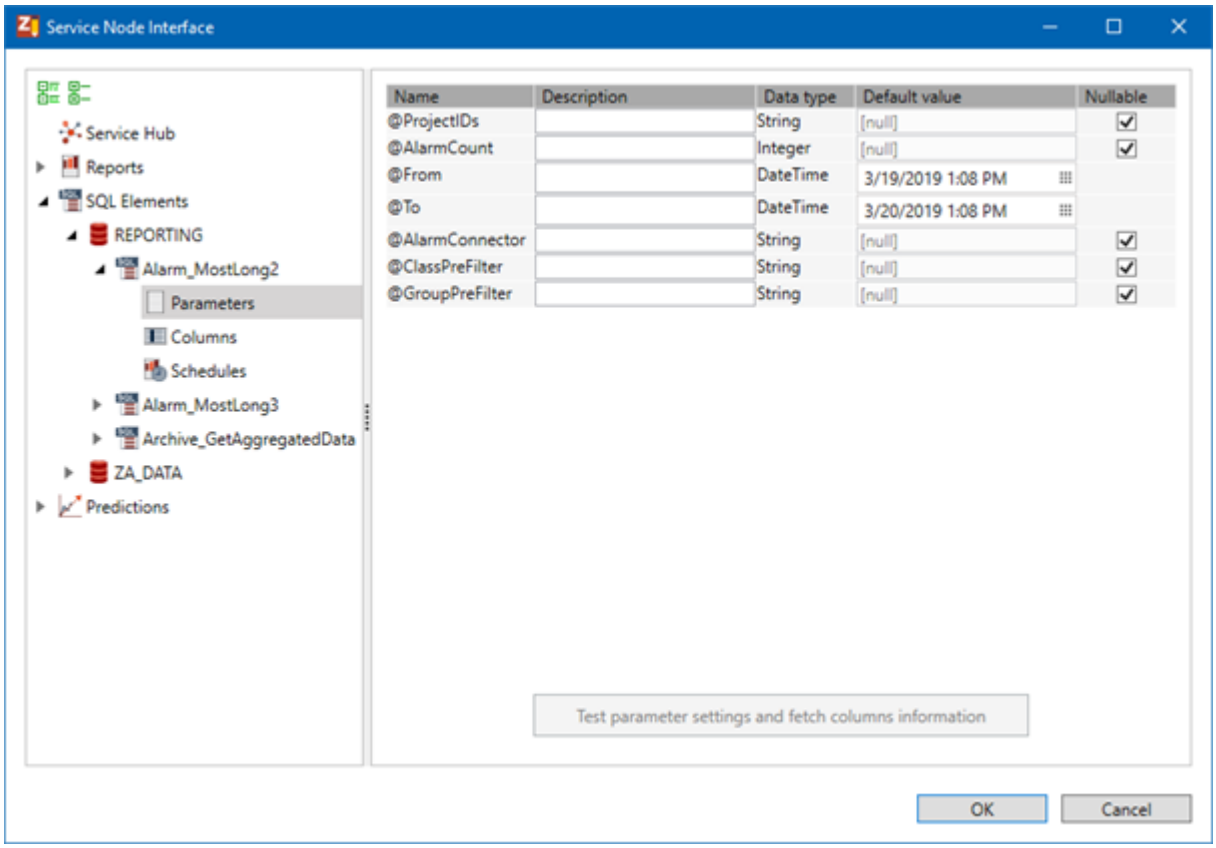
1. Select the SQL element that is to serve as the basis.
2. Click on **Copy**.

   A duplicate of the SQL element is added.
3. Change the name of the duplicate.
4. Configure parameters and schedules.

## 36.4.2 Parameters

Configuration of the report parameters.

> **Attention**
>
> Parameter values are obtained via the connector. Therefore, at the time of the configuration, the appropriate zenon Runtime must be running with the correct zenon project and it must be contactable.
> An error message is shown if there is no connection.




The parameters that are available depend on the SQL element type.

To configure parameters:

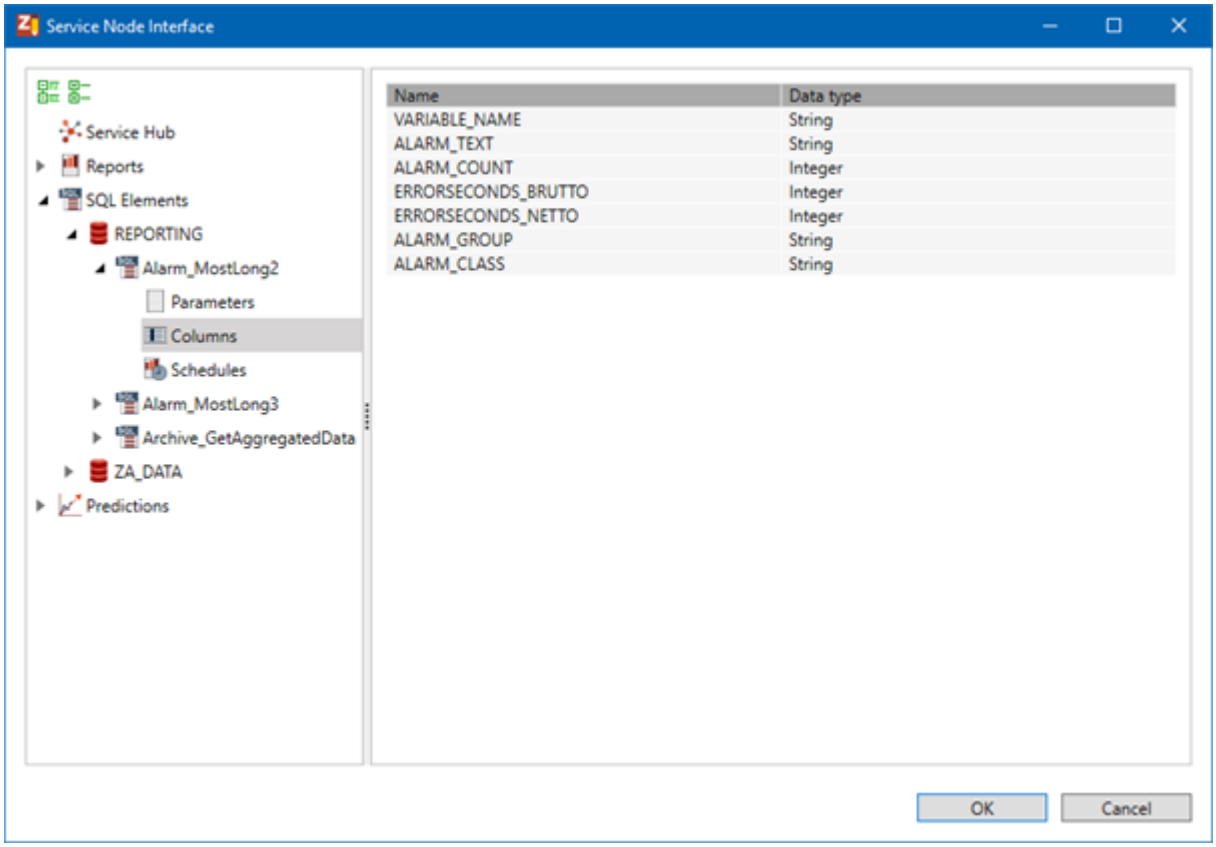
1. Select the respective parameters.
2. Enter the value for the parameter in the field or activate the checkbox for **NULL**.
   Use the calendar input dialog for date entries.
3. Enter a description for the respective parameter if required.
4. Click on the **Test Parameter Settings and Call Up Column Information** button.

   A query is thus sent to SQL Server. The result of the validation is displayed in a dialog. This query must be carried out each time the parameter values are changed.

**Hint:** First check the respective SQL element in **SQL Server Management Studio** and determine the correct parameters.

## 36.4.3 Columns

Display of the columns used by the SQL element.




The columns are filled the first time the **Test Parameter Settings and Call Up Column Information** button is clicked on. Changes are applied each further time it is clicked on.

**Attention:** There is no column information for **Scalar User Defined Functions**. Only the data type is returned. You can find information about this in the main node (on page 626) of the SQL element.

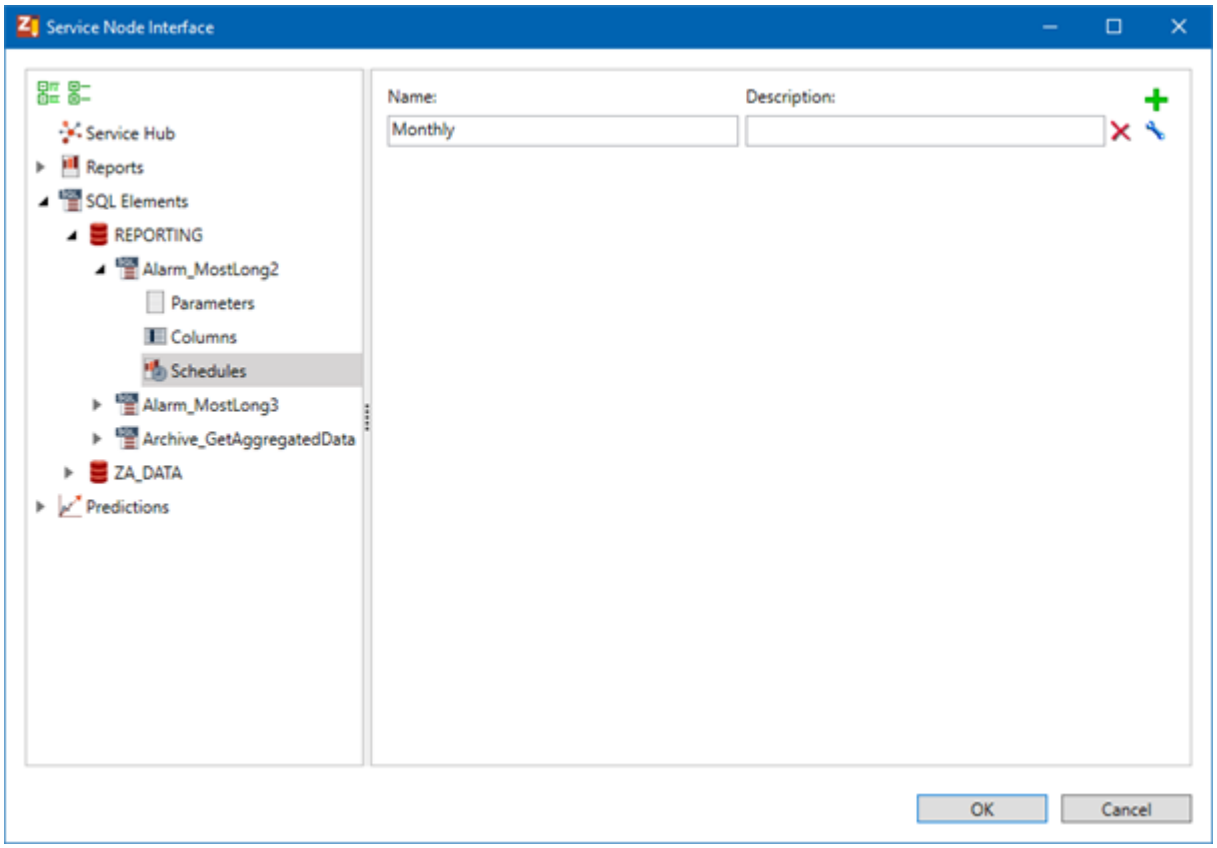
## 36.4.4 Schedules

SQL elements that have been provided for the **Service Grid** can be executed automatically via a schedule. To do this, each SQL element contains a **Schedules** node.

You can do the following here:

- Create new schedules
- Edit existing schedules
- Delete existing schedules

## SCHEDULES DIALOG




| Option | Description |
|---|---|
| **List of schedules** | Shows all configured schedules. |
| Symbol **+** | Clicking on the symbol opens the dialog to create and configure a schedule. |
| Symbol **X** | Clicking on the symbol deletes the selected schedule without a request for confirmation. |
| **Wrench** symbol | Clicking on the symbol opens the dialog to configure the selected schedule. |

## CREATE NEW SCHEDULE

To create a new schedule:

1. Click on the symbol **+**.

   The dialog for configuring the schedule (on page 644) is opened

2. Configure the schedule with:

   - **Schedule duration**

- **Date of execution**
- **Execution time**
- **Parameters**

3. Confirm the configuration by clicking on **OK**.

   The schedule is entered into the list.

4. Please define a name!
   The name must be unique within the report.

### EDIT SCHEDULE

To edit a schedule:

1. Select the schedule.
2. Click on the symbol with the wrench symbol.

   The dialog for configuring the schedule is opened.

3. Configure the schedule.
4. Confirm the configuration by clicking on **OK**.

### DELETE SCHEDULE

To delete a schedule:

1. Select the schedule.
2. Click on the symbol **X**.

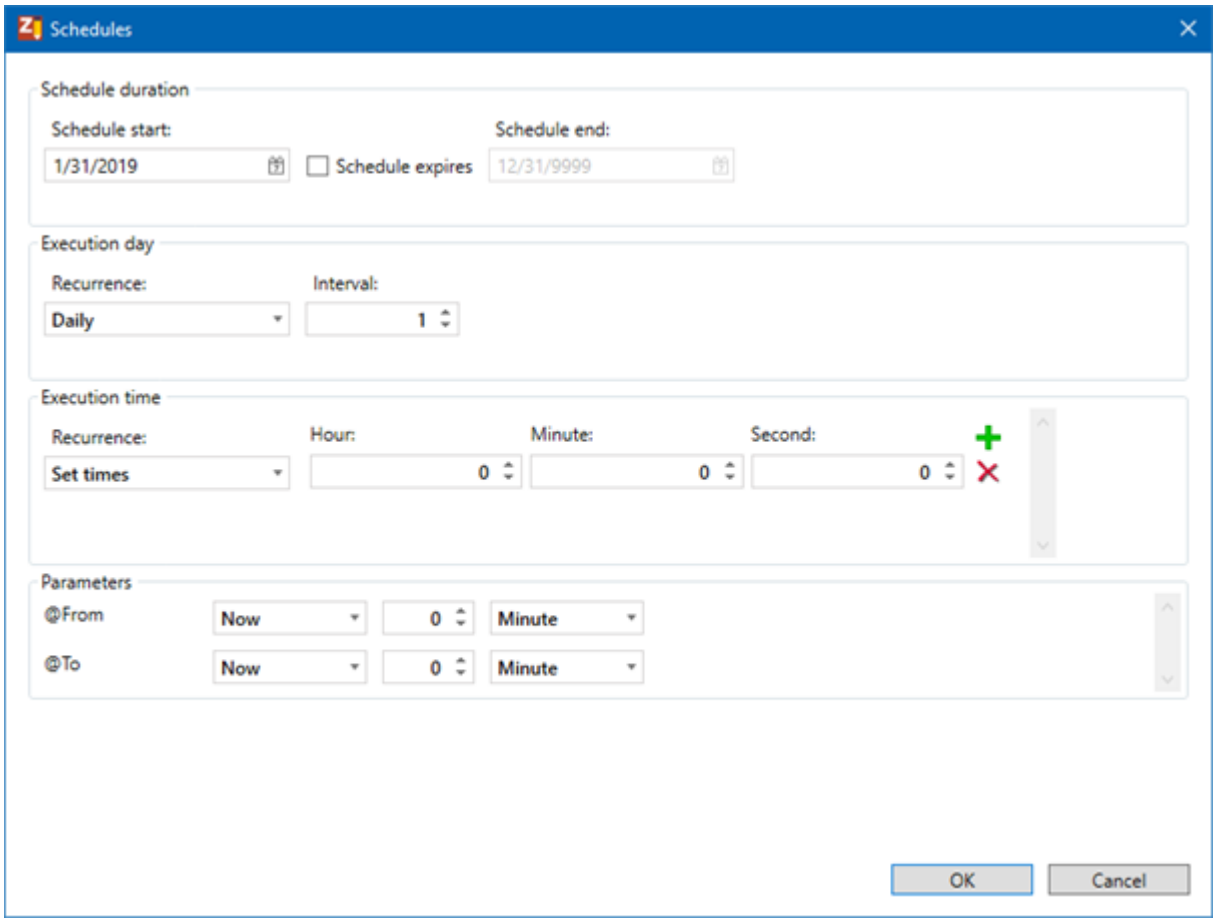
   The schedule is deleted.

## 36.4.4.1 Configure a schedule

You can configure the schedules for SQL elements here:

- Schedule duration
- Date of execution
- Execution time

- Parameter




## SCHEDULE DURATION

Configuration of the time range for which the schedule is applied.

| Option | Description |
|---|---|
| **Schedule start** | Start time of the schedule. The schedule is valid from this point.<br><br>Entry in the field directly in the format *dd.mm.yyyy* or selection via calendar element. |
| **Schedule expires** | Configuration of whether the schedule has an expiry date.<br><br>- *Active*: Schedule has a defined end.<br>- *Inactive*: Schedule is always valid from the start time.<br><br>Default: *inactive* |

| Option | Description |
|---|---|
| **Schedule end** | End time of the schedule. The schedule is invalid from this point.<br><br>Entry in the field directly in the format *dd.mm.yyyy* or selection via calendar element. |

### DATE OF EXECUTION

Configuration of the days on which the schedule is executed.

| Option | Description |
|---|---|
| **Recurrence** | Selection of the recurrence configuration from drop-down list:<br>▸ *Daily*<br>▸ *Weekly*<br>▸ *Monthly*<br><br>Default: *Daily* |
| **Interval** | Configuration of the intervals of the recurrence. Direct entry in the field or configuration using arrow keys.<br>▸ Minimum: *1*<br>▸ Maximum: *2147483647*<br><br>Default: *1* |
| **Weekday** | Configuration of the weekdays on which the schedule is executed.<br><br>Selection by activating the checkbox in front of the day.<br><br>Default: *Monday*<br><br>**Note:** Only available for weekly recurrence. |
| **Day** | Configuration of the days in the month on which the plan is executed:<br>▸ Entry in the text field directly or configuration using the arrow keys.<br>Minimum: *1*<br>Maximum: *28* |

| Option | Description |
|---|---|
| | ▸ Addition of further days: Click on the **+** symbol.<br>▸ Deletion of days: Click on the **X** symbol.<br>**Note:** Only available for monthly recurrence. |

### EXECUTION TIME: STIPULATED TIMES

Configuration for schedules with fixed times of execution.

| Option | Description |
|---|---|
| **Recurrence** | Type of recurrence.<br>Must be set to *stipulated times*. |
| **Hour** | Entry of the hour.<br>Direct entry in the field or configuration using arrow keys.<br>▸ Minimum: *0*<br>▸ Maximum: *23*<br>Default: *0* |
| **Minute** | Input of the minute.<br>Direct entry in the field or configuration using arrow keys.<br>▸ Minimum: *0*<br>▸ Maximum: *59*<br>Default: *0* |
| **Second** | Entry of the second.<br>Direct entry in the field or configuration using arrow keys.<br>▸ Minimum: *0*<br>▸ Maximum: *59*<br>Default: *0* |

### EXECUTION TIME: RECURRENCE PATTERN

Configuration for schedules with recurrence pattern.

| Option | Description |
|---|---|
| **Recurrence** | Type of recurrence.<br>Must be set to *recurrence pattern*. |
| **Interval** | Configuration of the intervals of the recurrence. Direct entry in the field or configuration using arrow keys.<br>▸ Minimum: *1*<br>▸ Maximum: Depending on unit:<br>Hour: *23*<br>minute: *1439*<br>second: *86399*<br>Default:*1* |
| **Time unit** | Selection of the scaling from a drop-down list:<br>▸ *Hour*<br>▸ *Minute*<br>▸ *Second*<br>Default: *Hour* |
| **Start time** | Definition of the start time via:<br>▸ **Hour**<br>▸ **Minute**<br>▸ **Second** |
| **End time** | Definition of the end time via:<br>▸ **Hour**<br>▸ **Minute**<br>▸ **Second** |

### PARAMETER

Configuration of the execution times.

| Option | Description |
|---|---|
| **From** | Selection of the start of the execution time.<br><br>**Note:** Not available for prediction models with a **value count** of *1*. |
| **To** | Selection of the end of the execution time.<br><br>**Note:** Not available for prediction models with a **value count** of *1*. |

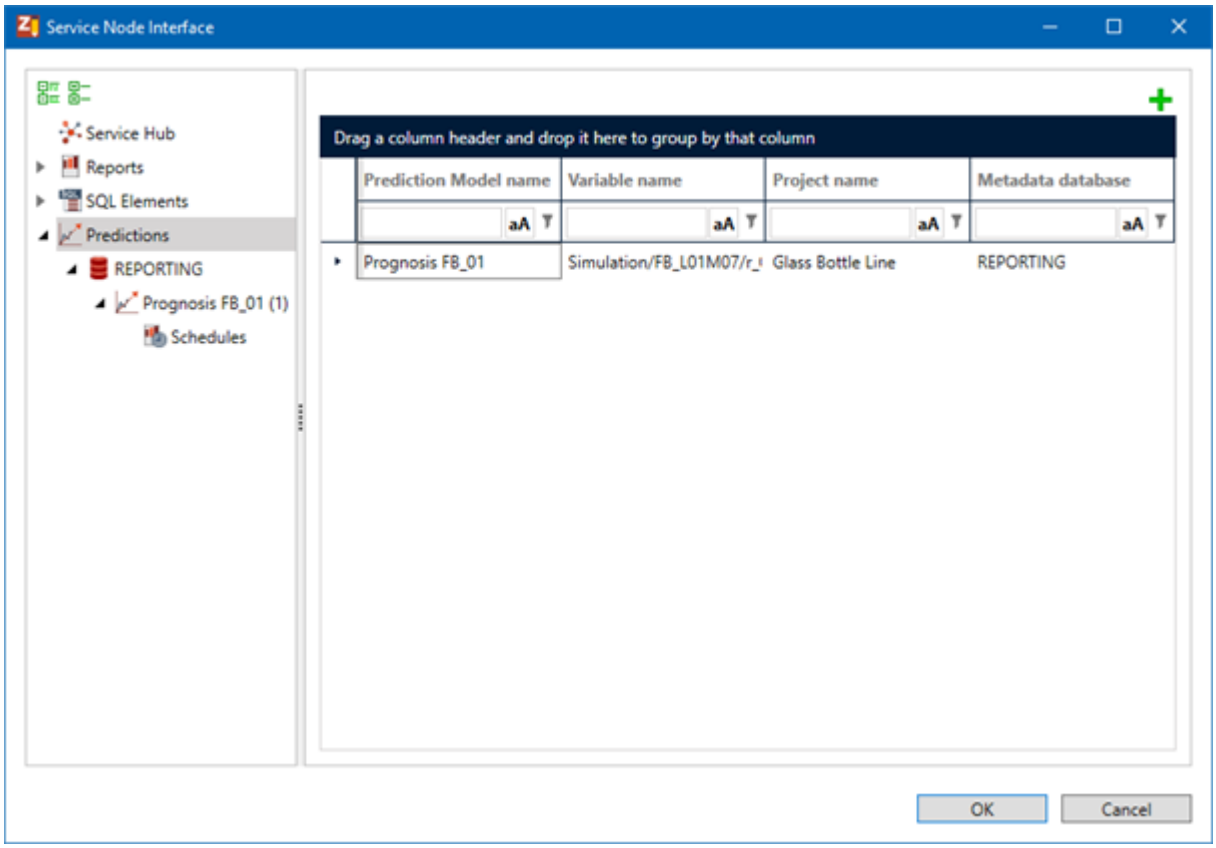
## 36.5 Prediction

Display and addition of prediction models. Existing prediction models are administered in the subordinate objects.

Structure:

- Level 1: Main nodes for the predictions.
- Level 2: Database in which the predictions are created.
- Level 2: Selected prediction model. The ID of the prediction model in the database is shown in brackets.

- Level 3: Schedules for the prediction model.




| Options | Description |
|---|---|
| + | Clicking on the button opens the dialog to select a prediction model. |
| **List of prediction models** | Displays all prediction models available in the **Service Node**. |

## ADD PREDICTION MODEL

To add a prediction model:

1. Click on the + symbol in the top right corner of the dialog.

   The selection dialog is opened.

2. Select the desired prediction model.
3. Click on OK.

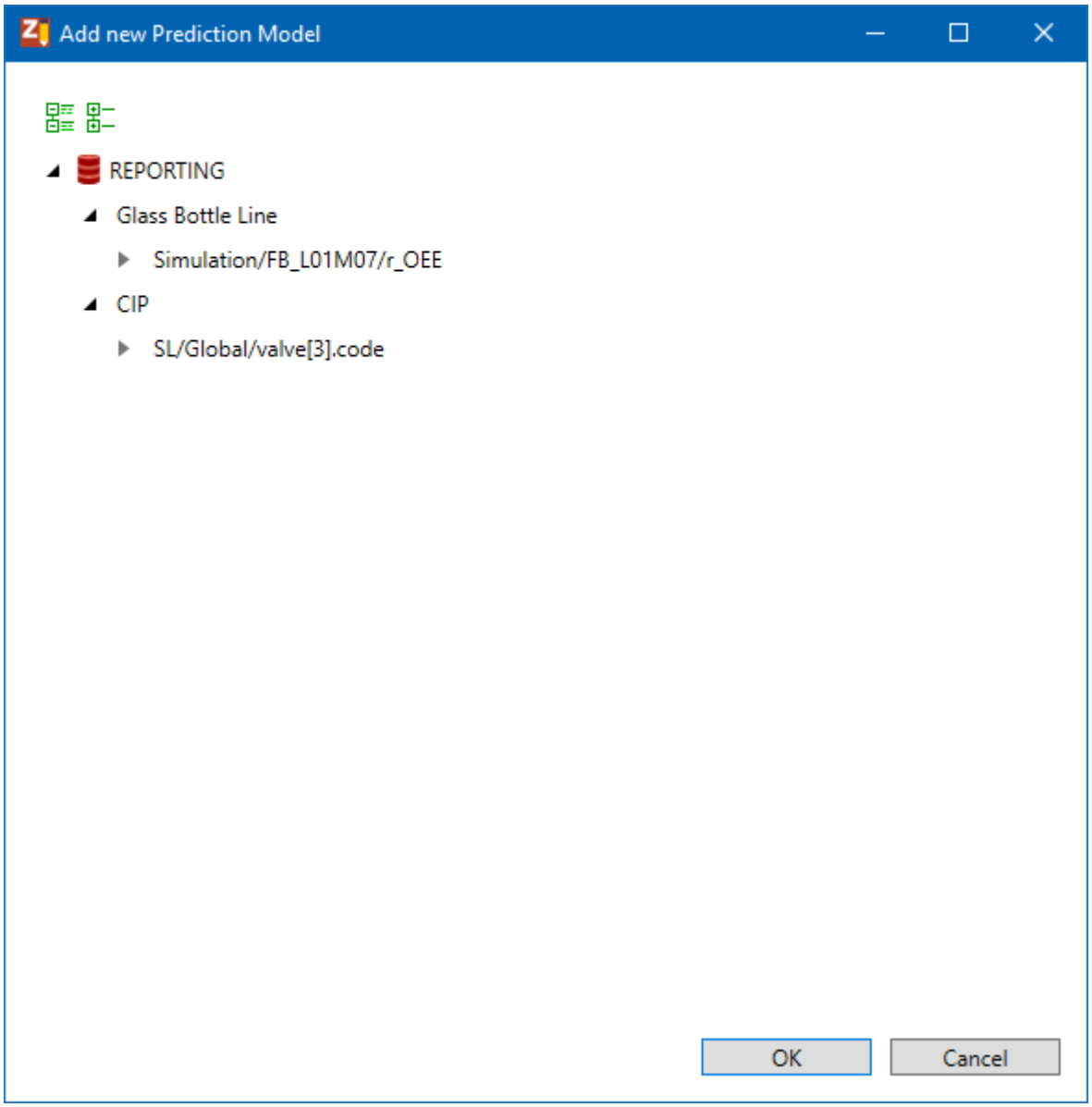
   The prediction model is added to the list.

   Objects that require entries are highlighted in red. In doing so, it is always the higher-level objects that are highlighted.

4. Configure at least one schedule.

**Note:** The prediction model is only saved in the configuration file and on the service hub if the **Service Node Interface** dialog is saved and closed with **OK**.

### ADD NEW PREDICTION MODEL DIALOG




| Option | Description |
|---|---|
| **Collapse/expand symbol node** | The objects subordinate to the main nodes can all be displayed as expanded or collapsed.<br>Individual nodes are expanded or collapsed with a mouse click. |

| Option | Description |
|---|---|
| **Selection tree of the prediction models** | Display of the prediction models present. Selection via mouse click.<br>Structure:<br>▸ 1. Node: Database name.<br>▸ 2. Node: Name zenon project.<br>▸ 3. Node: Variable name.<br>▸ 4. Node: Name of prediction model. |
| **OK** | Applies selection, closes the dialog and enters tthe selected prediction model into the list. |
| **Cancel** | Discards selection and closes the dialog. |

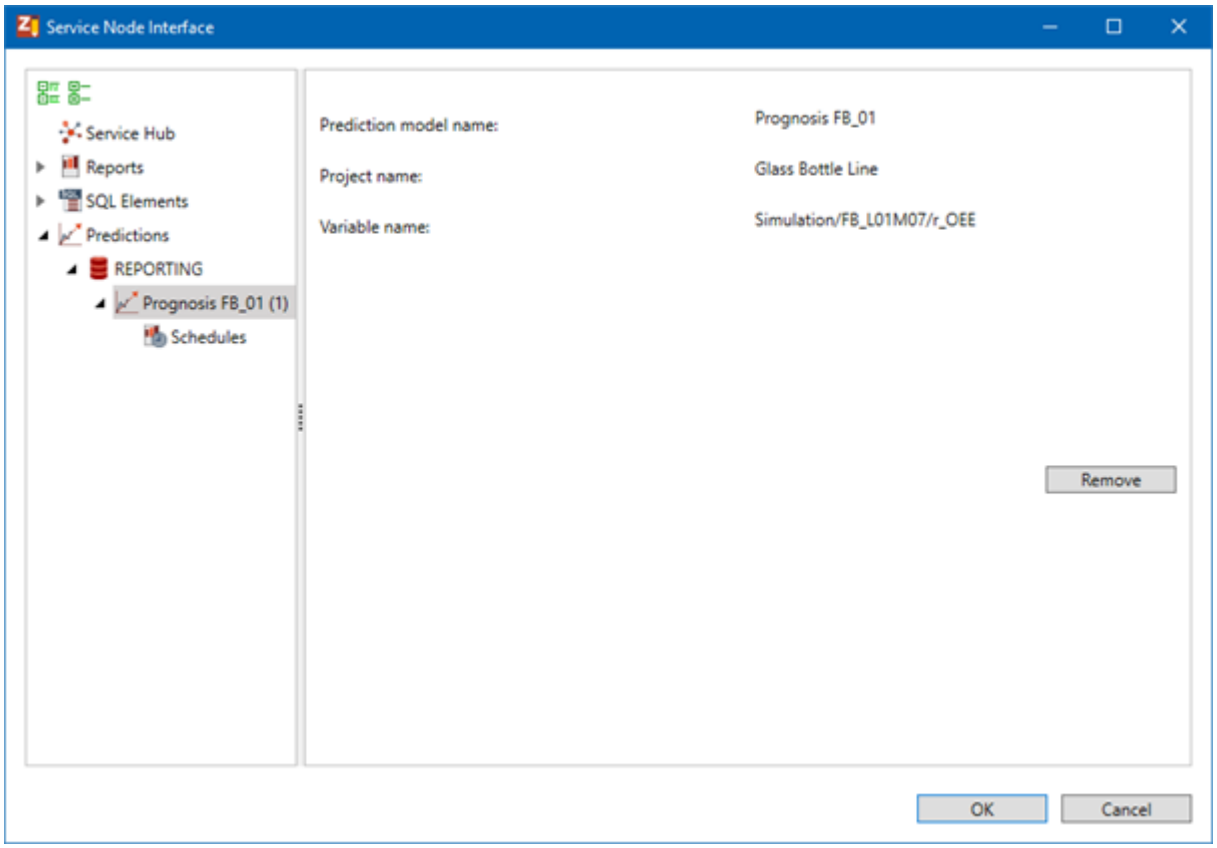
## 36.5.1Prediction model

Display of a selected prediction model.

You have the possibility:

- To see the prediction model name, zenon project name and variable name.
- To remove prediction models.

## CONFIGURE THE PREDICTION MODEL DIALOG




| Option | Description |
|---|---|
| **Prediction model name** | Name of the prediction model.<br>Display only. |
| **Project name** | Name of the zenon Logic project<br>Display only. |
| **Variable name** | Name of the variable.<br>Display only. |
| **Remove** | Clicking on the button removes the prediction model from the list. |

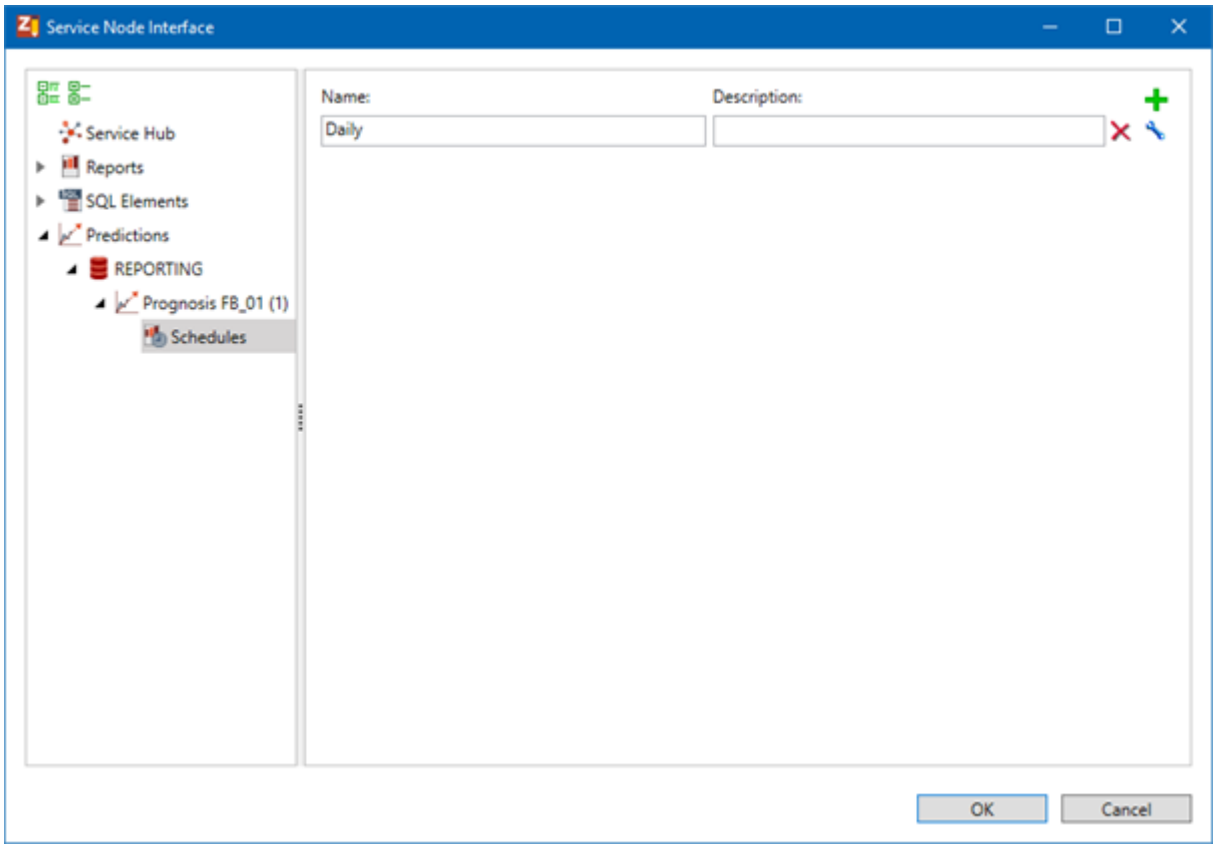
## 36.5.2 Schedules

Prediction models that have been prepared for the **Service Grid** are executed automatically by means of a schedule. Each prediction model has a **Schedules** node for this. Each prediction model must have at least one schedule.

You can do the following here:

- Create new schedules
- Edit existing schedules
- Delete existing schedules

### SCHEDULES DIALOG




| Option | Description |
|---|---|
| **List of schedules** | Shows all configured schedules. |
| Symbol **+** | Clicking on the symbol opens the dialog to create and configure a schedule. |
| Symbol **X** | Clicking on the symbol deletes the selected schedule without a request for confirmation. |

| Option | Description |
|---|---|
| **Wrench** symbol | Clicking on the symbol opens the dialog to configure the selected schedule. |

## CREATE NEW SCHEDULE

To create a new schedule:

1. Click on the symbol **+**.

   The dialog for configuring the schedule (on page 644) is opened
2. Configure the schedule with:
   - **Schedule duration**
   - **Date of execution**
   - **Execution time**
   - **Parameters**
3. Confirm the configuration by clicking on **OK**.

   The schedule is entered into the list.
4. Please define a name!
   The name must be unique within the report.

## EDIT SCHEDULE

To edit a schedule:

1. Select the schedule.
2. Click on the symbol with the wrench symbol.

   The dialog for configuring the schedule is opened.
3. Configure the schedule.
4. Confirm the configuration by clicking on **OK**.

## DELETE SCHEDULE

To delete a schedule:

1. Select the schedule.
2. Click on the symbol **X**.

   The schedule is deleted.

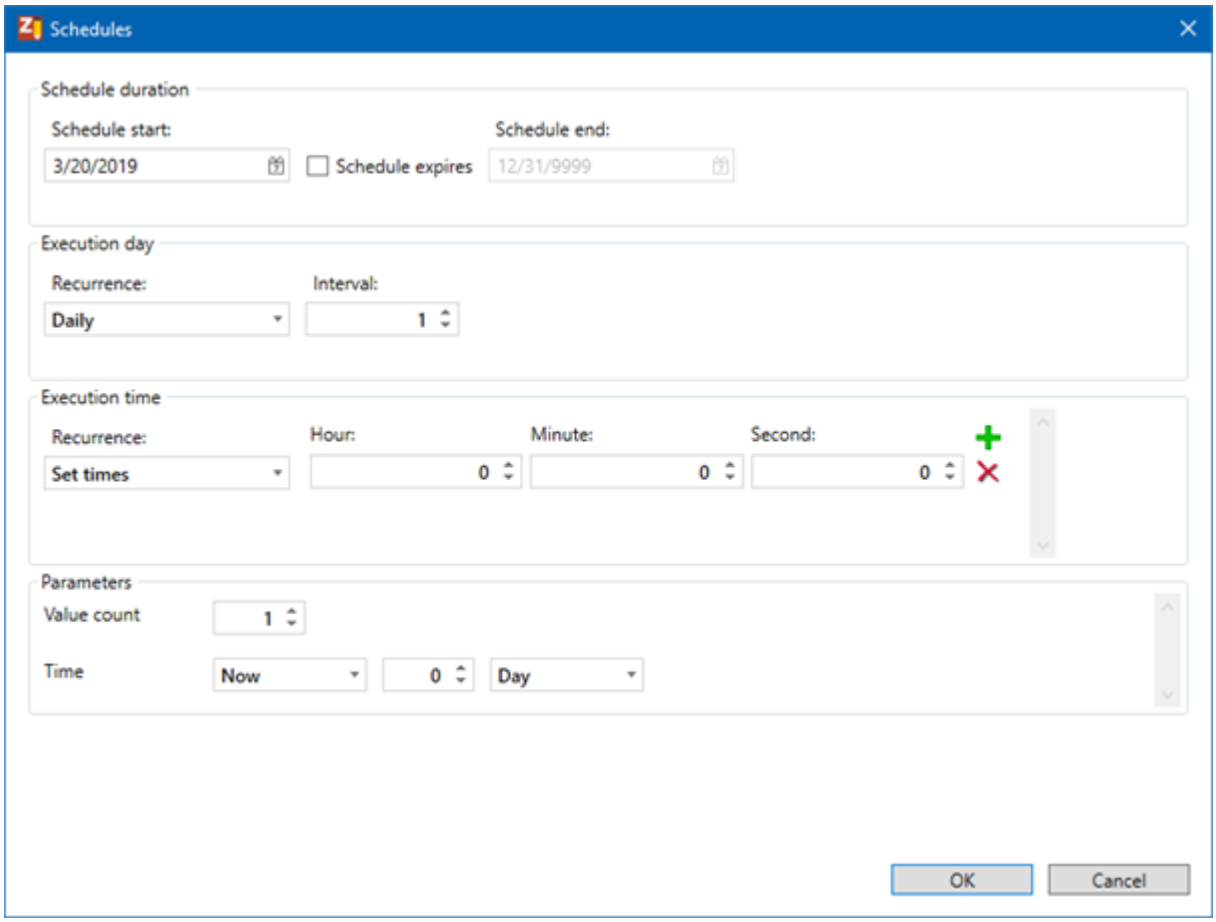
### 36.5.2.1 Configure a schedule

Here you configure the schedules for predictions with:

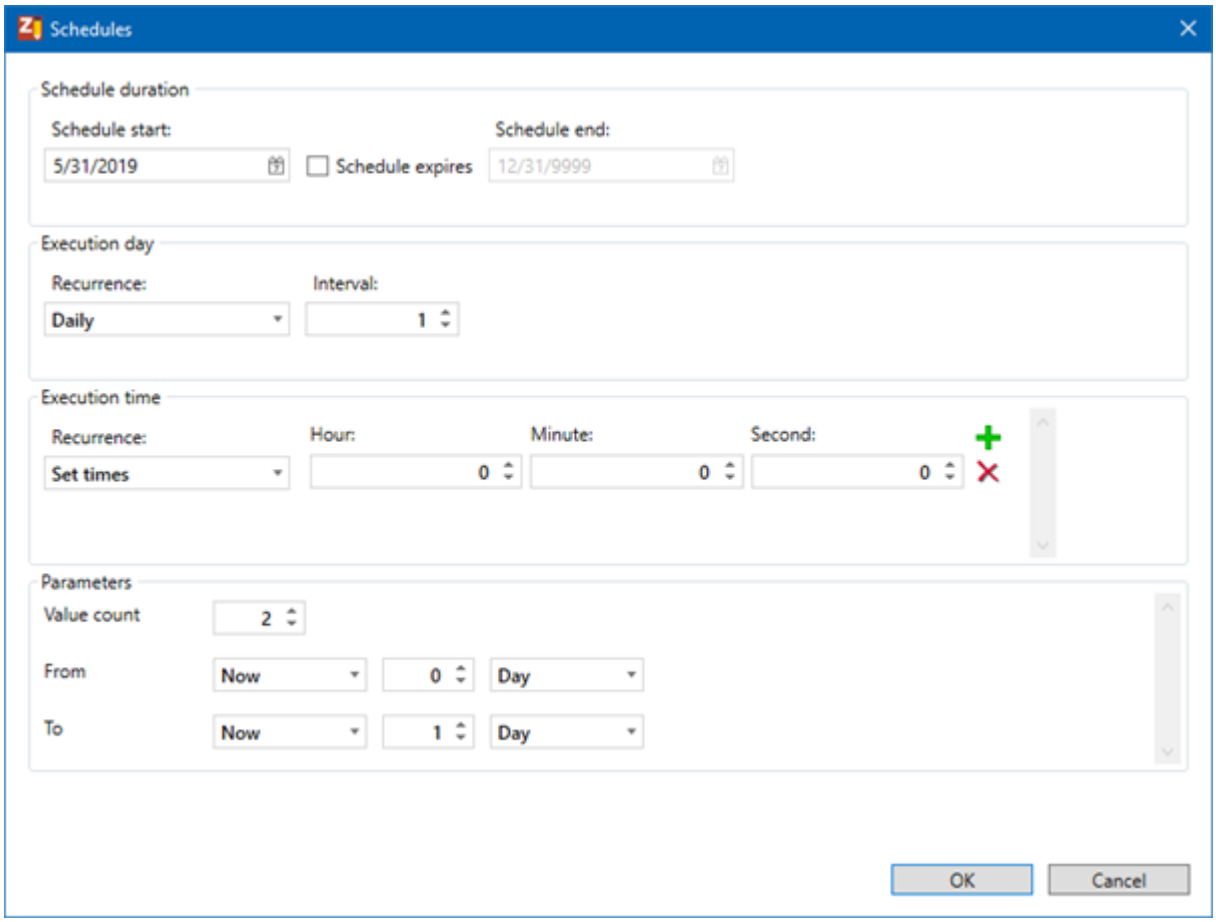
- Schedule duration
- Date of execution
- Execution time
- Parameter

The schedule configuration differs depending on whether a value is configured or several values are used.

**One value:**



Several values:




## SCHEDULE DURATION

Configuration of the time range for which the schedule is applied.

| Option | Description |
|---|---|
| **Schedule start** | Start time of the schedule. The schedule is valid from this point.<br><br>Entry in the field directly in the format *dd.mm.yyyy* or selection via calendar element. |
| **Schedule expires** | Configuration of whether the schedule has an expiry date.<br><br>▸ *Active*: Schedule has a defined end.<br>▸ *Inactive*: Schedule is always valid from the start time.<br><br>Default: *inactive* |

| Option | Description |
|---|---|
| **Schedule end** | End time of the schedule. The schedule is invalid from this point.<br><br>Entry in the field directly in the format *dd.mm.yyyy* or selection via calendar element. |

### DATE OF EXECUTION

Configuration of the days on which the schedule is executed.

| Option | Description |
|---|---|
| **Recurrence** | Selection of the recurrence configuration from drop-down list:<br>▸ *Daily*<br>▸ *Weekly*<br>▸ *Monthly*<br><br>Default: *Daily* |
| **Interval** | Configuration of the intervals of the recurrence. Direct entry in the field or configuration using arrow keys.<br>▸ Minimum: *1*<br>▸ Maximum: *2147483647*<br><br>Default: *1* |
| **Weekday** | Configuration of the weekdays on which the schedule is executed.<br><br>Selection by activating the checkbox in front of the day.<br><br>Default: *Monday*<br><br>**Note:** Only available for weekly recurrence. |
| **Day** | Configuration of the days in the month on which the plan is executed:<br>▸ Entry in the text field directly or configuration using the arrow keys.<br>Minimum: *1*<br>Maximum: *28* |

| Option | Description |
|---|---|
| | ▸ Addition of further days: Click on the **+** symbol.<br>▸ Deletion of days: Click on the **X** symbol.<br>**Note:** Only available for monthly recurrence. |

### EXECUTION TIME: STIPULATED TIMES

Configuration for schedules with fixed times of execution.

| Option | Description |
|---|---|
| **Recurrence** | Type of recurrence.<br>Must be set to *stipulated times*. |
| **Hour** | Entry of the hour.<br>Direct entry in the field or configuration using arrow keys.<br>▸ Minimum: *0*<br>▸ Maximum: *23*<br>Default: *0* |
| **Minute** | Input of the minute.<br>Direct entry in the field or configuration using arrow keys.<br>▸ Minimum: *0*<br>▸ Maximum: *59*<br>Default: *0* |
| **Second** | Entry of the second.<br>Direct entry in the field or configuration using arrow keys.<br>▸ Minimum: *0*<br>▸ Maximum: *59*<br>Default: *0* |

### EXECUTION TIME: RECURRENCE PATTERN

Configuration for schedules with recurrence pattern.

| Option | Description |
|---|---|
| **Recurrence** | Type of recurrence.<br>Must be set to *recurrence pattern*. |
| **Interval** | Configuration of the intervals of the recurrence. Direct entry in the field or configuration using arrow keys.<br>▸ Minimum: *1*<br>▸ Maximum: Depending on unit:<br>Hour: *23*<br>minute: *1439*<br>second: *86399*<br>Default:*1* |
| **Time unit** | Selection of the scaling from a drop-down list:<br>▸ *Hour*<br>▸ *Minute*<br>▸ *Second*<br>Default: *Hour* |
| **Start time** | Definition of the start time via:<br>▸ **Hour**<br>▸ **Minute**<br>▸ **Second** |
| **End time** | Definition of the end time via:<br>▸ **Hour**<br>▸ **Minute**<br>▸ **Second** |

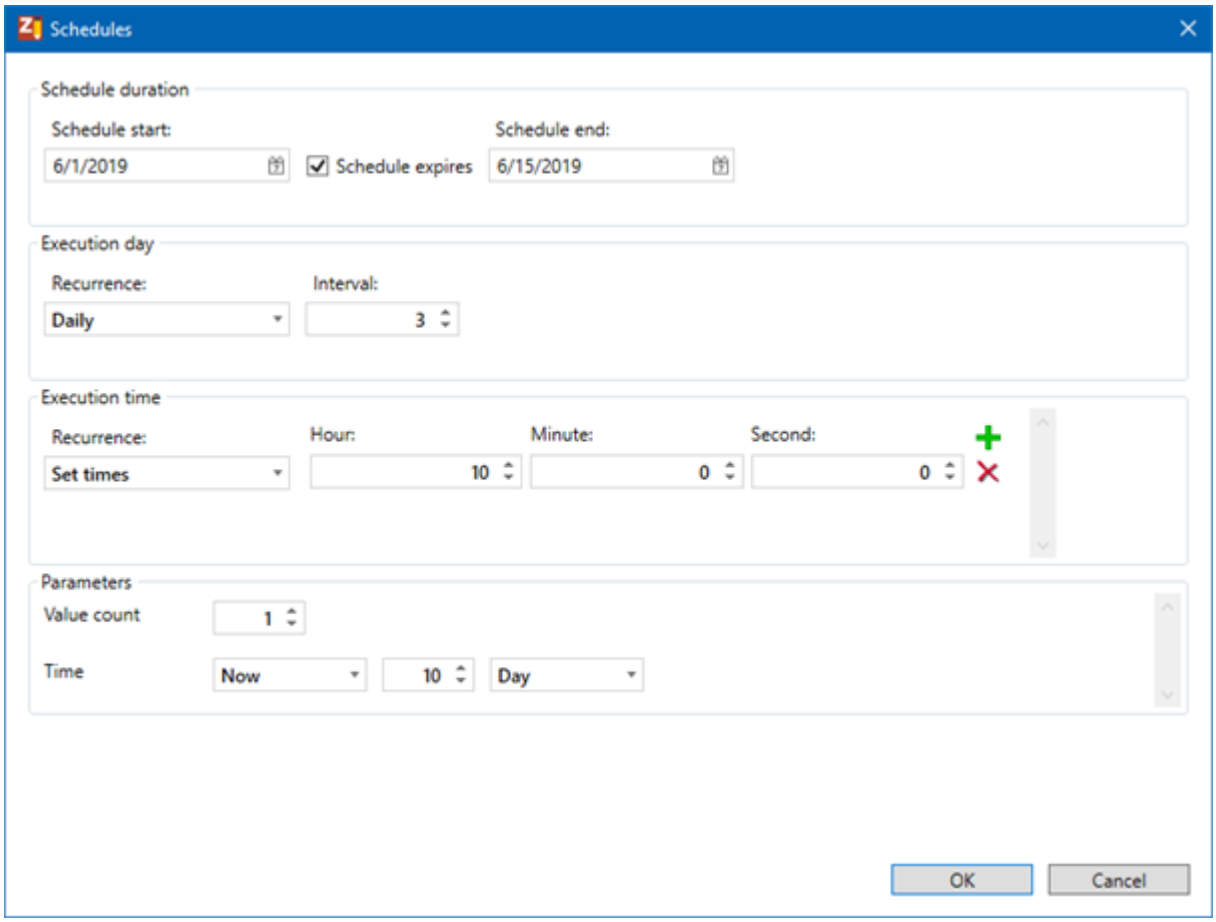
### PARAMETER

Configuration of the execution times.

| Option | Description |
| --- | --- |
| **Number of values** | Number of values that are set for the time period. Direct entry in the field or selection using arrow keys.<br>▸ Minimum: *1*<br>▸ Maximum: *1000*<br>Default: *1* |
| **Input** | Configuration of the prediction time.<br>**Note:** Only available for prediction models with a **value count** of *1*. |
| **From** | Selection of the start of the execution time.<br>**Note:** Not available for prediction models with a **value count** of *1*. |
| **To** | Selection of the end of the execution time.<br>**Note:** Not available for prediction models with a **value count** of *1*. |

# 37Example schedule configuration

Configuration of a schedule for prediction models. Schedules for reports and SQL elements are configured along the same lines.




**Configuration:**

- Start of schedule: *01. 06. 2019*
- End of schedule: *15. 06. 2019*
- Time interval: *Every 3 days*
- Time of execution: *10:00:00*
- Parameter:
  - Number of values: *1*
  - Entry: *now, 10 days*

**Execution:**

| Execution on/at | Result |
|---|---|
| 6/1/2019, 10:00:00 AM | Calculates prediction for June 11, 2019 |
| 6/4/2019, 10:00:00 AM | Calculates prediction for 6/14/2019 |
| 6/7/2019, 10:00:00 AM | Calculates prediction for 6/17/2019 |
| 6/10/2019, 10:00:00 AM | Calculates prediction for 6/20/2019 |
| 5/13/2019, 10:00:00 AM | Calculates prediction for 6/23/2019 |

# 38 Migration Tool

The **Migration Tool** allows the migration of Analyzer servers. Migration is possible from servers of version 2.00 or higher.
The following can be migrated:

- Server with the same software version
- Servers from one software version to a later version

The following is migrated:

- Metadata databases (including SP, UDF, SQL connector, 3rd party database connector, archive emulation)
- Reporting Services (database, users, RDL files)
- Users including their authorizations for SQL Server, Analyzer applications, Reporting Services
- SQL Agent jobs
- SQL Agent jobs for the retraining of prediction models
- Database backup jobs
- Linked Server
- Configuration for email (local only)
- Schedules and subscriptions (delivery method of email only if the email client is configured)
- Customer-specific RDL template

## REQUIREMENTS

Ensure the following before migration:

- Source and target server must be connected via the network.

- The target server must not contain any databases or reports in the SQL Server instance ZAx, otherwise an error message is shown.
  **Exceptions:** The initial database **ZA_DATA** installed with the Analzyer setup and the optionally-installed demo database **REPORTING**, including the attendant reports, can be present of the target server.
- The access rights to network shares must be set correctly. For details, see the **Set access rights to network share correctly** section.

> **Information**
>
> Report definition files present on the Analyzer Server (***.zams_rep**) are not applied during a migration. If these are also required on the target Analyzer, they must be transferred manually.

## START MIGRATION TOOL

The tool can be started from ZAMS or as a stand-alone application.

**Start via ZAMS:**

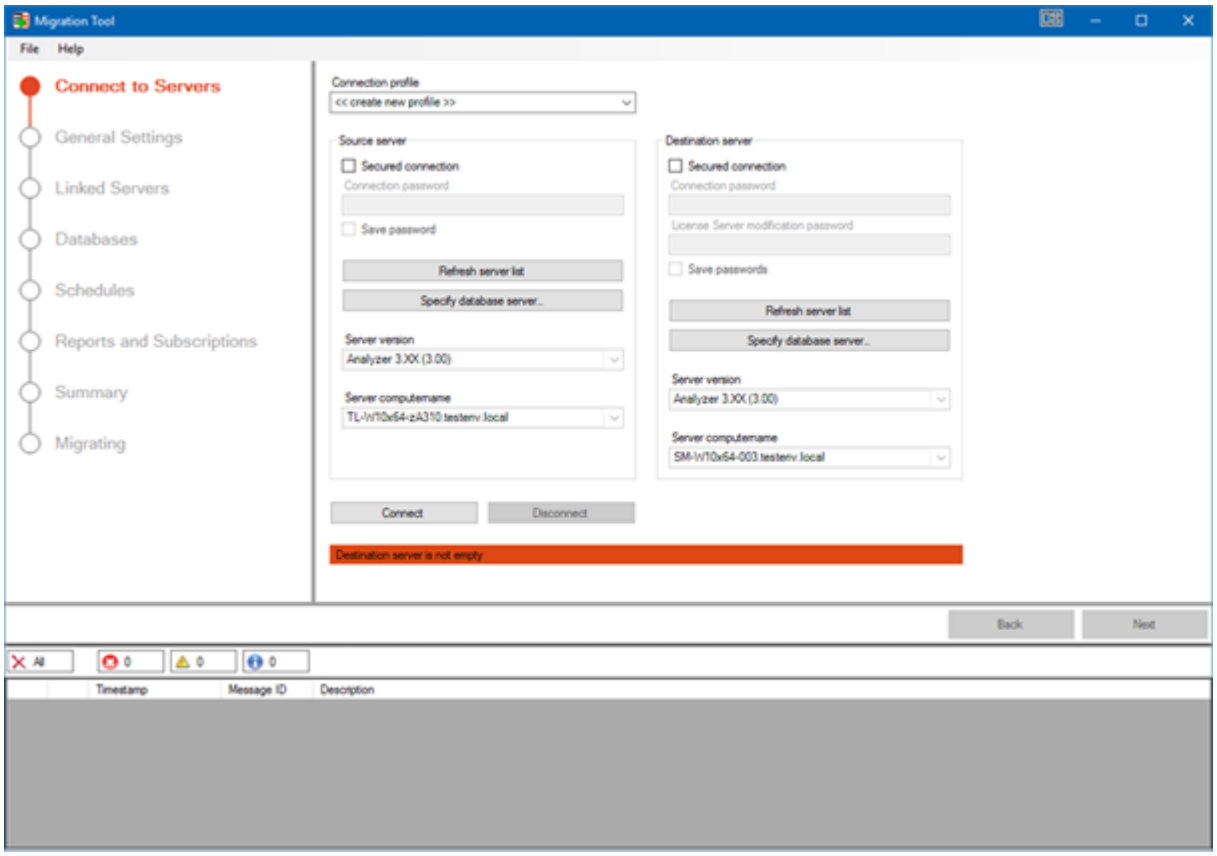
1. Navigate to the **Options** ribbon in ZAMS.
2. Click on the **Migration Tool** entry.

   The **Migration Tool** is started.

**Start as stand-alone application:**

- In the Windows Start menu, select the **COPA-DATA -> Migration Tool**entry.
  The **Migration Tool** is started.

## USER INTERFACE




| Option | Description |
|---|---|
| **Menus** | For the **Migration Tool**, the two menu items **File** and **Help** are available:<br><br>**File:**<br>Contains the sub-items:<br>▸ **Options**: Opens the Options dialog (on page 654).<br>▸ **Exit**: Exits the application.<br><br>**Help:**<br>Contains the subpoints:<br>▸ **Info about**: Displays information on the version and copyright.<br>▸ **Help**: Opens online help. |
| **Step display** | Display of the step to be configured. |
| **Configuration view** | Can also be subdivided into tree view and detail |

| Option | Description |
|---|---|
| | view for a step.<br><br>Display of the status and configuration of the objects of the respective step. |
| **Navigation** | Navigate (on page 660) in the migration steps using the **Back** and **Next** buttons. |
| **Visualization window** | Display (on page 662) of errors, warnings and notifications. |

This dialog saves the following settings in the configuration file and recreates these on the next start:

- Window position
- Window size
- Size of the output window
- Display options for groups of errors, warnings and messages in the output window.

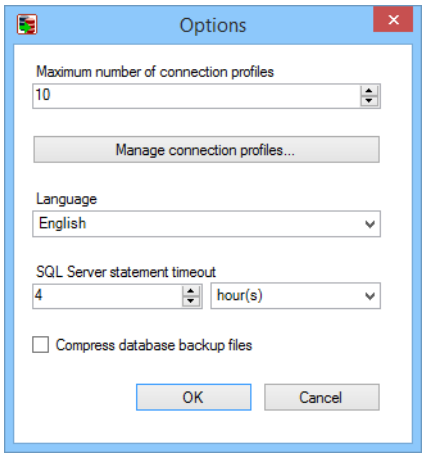
# 39 Options

The dialog to configure the options can be reached via the **File** menu.

The options include:

- Maximum number of connection profiles
- Administration of the connection profiles
- Selection of the user interface language

## CONFIGURATION DIALOG SETTINGS

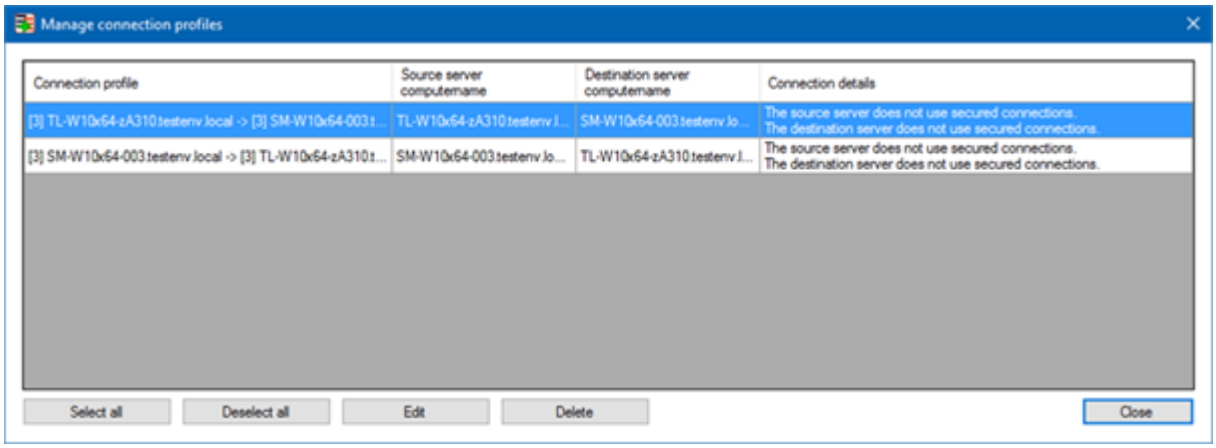



| Option | Description |
|---|---|
| **Maximum number of connection profiles** | Number of connection profiles that are saved. If the set maximum number is exceeded when creating a new connection profile, then the profile that has not been used the longest is deleted.<br><br>Entry in the field or configuration using the arrow keys.<br><br>▸ Minimum: 1<br>▸ Maximum: 255 |
| **Manage connection profiles** | Clicking on the button opens the dialog (on page 657) for administering the connection profiles. |
| **Language** | Selection of the user interface language from the drop-down list. The language is immediately switched after the change is set and **OK** is clicked on. |
| **SQL Server statement timeout** | Entry of the SQL server statement timeout.<br><br>This timeout enters into force if an individual SQL Statement runs for longer than is defined here, for example when backing up or when restoring a large database. With new connections, the currently-set value is used for the Timeout. If this is amended in the options, the existing connections are amended to the new value.<br><br>The Timeout can be set to a value between *1* minute and *7* days.<br><br>**Input elements:**<br><br>▸ Number element:<br>Entry of the quantity in the field directly or by means of the arrow keys.<br>Possible values for : |

| Option | Description |
|---|---|
| | - days: *1 - 7*<br>- hours: *1 - 168*<br>- minutes: *1 - 10080*<br>▸ Drop-down list for granularity:<br>Possible values:<br>- minutes<br>- hours<br>- *days*<br>This selection influences the value range of the number element.<br>Default:*4 hours* |
| **Compress database backup files** | Setting of whether backup files are compressed.<br>▸ *Active*: Backup files are compressed.<br>Setting has an effect on all:<br>▸ Database backups created during database migration<br>▸ Database backup jobs on the target server, regardless of the setting on the source server<br>Database backup jobs are recognized and compressed or uncompressed and displayed accordingly. This detection and display depends on the status of this option. |
| **OK** | Applies settings and closes the dialog.<br>Changes are applied and the dialog is closed.<br>**Attention:** All change in the Administer connection profiles (on page 657) subdialog only become effective if this dialog is closed with **OK**. No changes are made if this is closed. |
| **Cancel** | Discards all changes and closes the dialog. |

## 39.1 Manage connection profiles

Up to 255 connection profiles (on page 664) can be created for migration. These are administered in this dialog. You can change the login data for the source server and destination server, and delete profiles from the connection list.



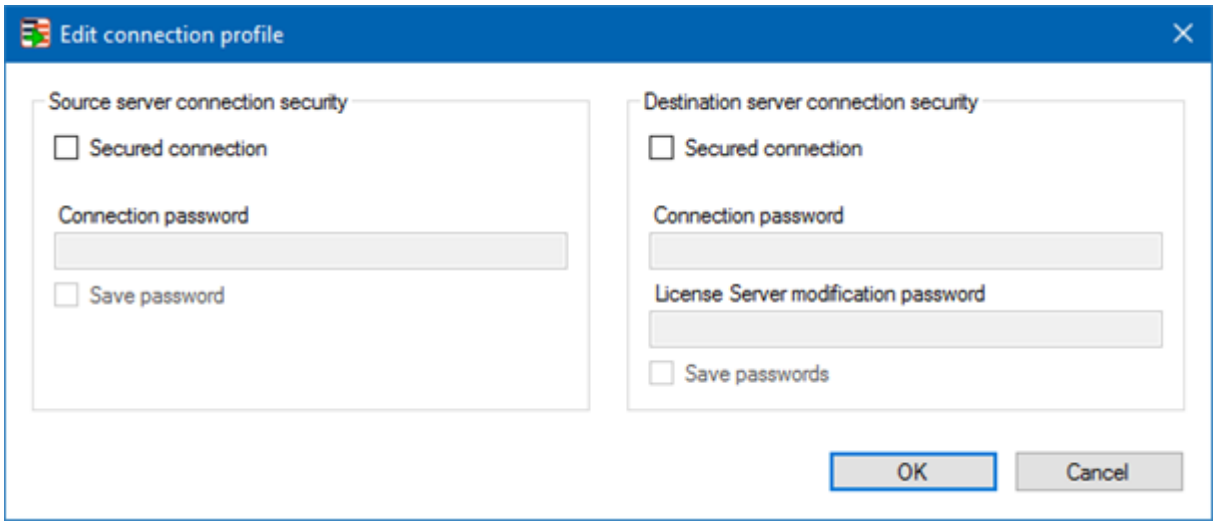

| Option | Description |
|---|---|
| **List of connection profiles** | Lists all configured connections. The following is displayed for each connection:<br>▸ **Connection profile**: Name of the connection profile including server name and Analyzer server version<br>▸ **Source server computername**: Computer name of the source server<br>▸ **Destination server computername**: Computer name of the destination server<br>▸ **Connection details**: Show:<br>connection status for the source server<br>connection security for the destination server<br>Clicking on the entry selects the connection for editing. Multi-selection is possible via keys **Ctrl + click** or keys **Shift + click**. |
| **Select all** | Clicking on the button selects all entries for editing. |
| **Deselect all** | Clicking on the button deselects the selection. |
| **Edit** | Opens the **dialog** (on page 658) for configuring a wake up call. |

| Option | Description |
|---|---|
| **Delete** | Clicking on the button deletes the selected connection profile from the list. |
| **Close** | Changes are applied and the dialog is closed.<br><br>**Attention:** All changes only become effective if the basic **Options** (on page 654) dialog is closed by clicking on OK. No changes are made if this is closed. |

**Note:** To reverse changes, close this dialog by clicking on **Close** and leave the **Options** dialog by clicking on **Cancel**.

### 39.1.1 Edit

Activation or deactivation of the connection security for existing profiles. The options for connection security are only available if all used connection profiles have the same availability of connection security.




| Option | Description |
|---|---|
| **Source server connection security** | Settings for the connection security for the source server. The entries must correspond to the configuration on the server.<br><br>Only available if the zenon Analyzer is version >= 3 on the source server. |
| **Secured connection:** | Activation or deactivation of the encrypted communication. |

| Option | Description |
|---|---|
| | ▸ *Active*: Communication is encrypted. For each connection, depending on the degree of encryption, passwords must be entered for the license service.<br>▸ *Inactive*: Communication is not encrypted. |
| **Connection password** | Entry of the password for the connection to the license server.<br>Input is always hidden. The actual length is disguised. If the input field is active, it must be filled in order for a connection to be established.<br>Only active if the **Secured communication** and **Save passwords** options have been activated. |
| **Save password** | Stipulation of whether the connection parameters are saved in the connection profile.<br>Saving is carried out as a hardware-dependent and user-dependent hash of the password. |
| **Destination server connection security** | Settings for the connection security for the target server. The entries must correspond to the configuration on the server.<br>Only available if the zenon Analyzer is version >= 3 on the target server. |
| **Secured connection:** | Activation or deactivation of the encrypted communication.<br>▸ *Active*: Communication is encrypted. For each connection, depending on the degree of encryption, passwords must be entered for the license service.<br>▸ *Inactive*: Communication is not encrypted. |
| **Connection password** | Entry of the password for the connection to the license server.<br>Input is always hidden. The actual length is disguised. If the input field is active, it must be filled in order for a connection to be established.<br>Only active if the **Secured communication** and **Save passwords** options have been activated. |
| **License Server modification** | Entry of the change password on the license server. |

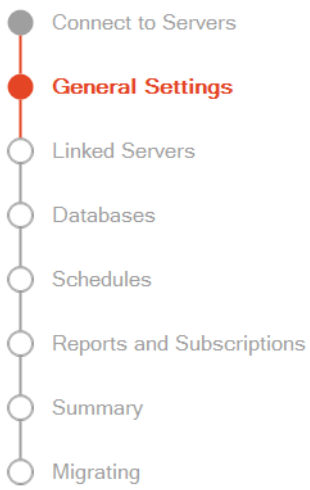
| Option | Description |
|---|---|
| **password** | Entry is always hidden. The actual length is disguised. If the input field is active, it must be filled in order for a connection to be established.<br><br>Only active if the **Secured communication** and **Save passwords** options have been activated. |
| **Save passwords** | Stipulation of whether the connection parameters are saved in the connection profile.<br>Saving is carried out as a hardware-dependent and user-dependent hash of the password. |

### CLOSE DIALOG

| Option | Description |
|---|---|
| **OK** | Applies settings and closes the dialog. |
| **Cancel** | Discards all changes and closes the dialog. |

# 40 Navigation

The configuration dialog will run through in individual steps. These are displayed in a list on the left edge of the tool.




The display of the individual steps shows their current status:

| Circle symbol | Label | Status |
|---|---|---|
| Full | gray | configured |
| Full | orange | Is currently being configured |
| empty | gray | not yet configured |

The direct number of individual steps is not possible. The configuration dialog is navigated through using buttons. It is always possible to switch between two adjacent steps. When switching between two steps, all inputs of the active step are validated. The switch is only possible if the configuratiuon for migration is valid in this step.

The button to go forward to the next steps changes its function depending on the step.

## NAVIGATION BETWEEN STEPS

### GENERAL

| Button | Description |
|---|---|
| **Back** | Clicking on the button goes one step back in the configuration.<br>Only available if:<br>▸ It is not the first or last step that is active<br>▸ The currently-active step activates the button |
| **Next** | Clicking on the button goes one step forward in the configuration.<br>Only available up to the **migration overview** and if the currently-active step activates the button. |

### MIGRATION OVERVIEW STEP

| Button | Description |
|---|---|
| **Back** | Clicking on the button goes one step back in the configuration. |
| **Start migration** | Clicking on the button starts the migration.<br>Only available if the check of the configuration activates the button.<br>**Attention:** This can no longer be canceled once the migration is started. |

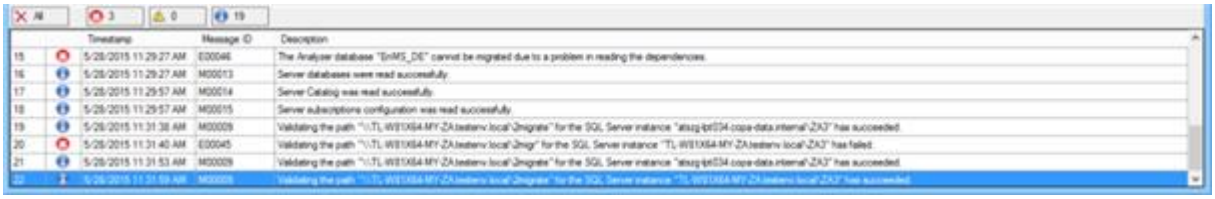
### MIGRATION RUNNING STEP

| Button | Description |
|---|---|
| **Back** | not available. |
| **New migration** | Clicking on the button switches to the first step in order to configure a new migration. |

# 41 Output window

The output window lists error messages, warnings, information and status messages in a table. These notices can be filtered and deleted.

## DISPLAY IN THE OUTPUT WINDOW



| Option | Description |
|---|---|
| **Buttons** | Control display of the messages and navigation (on page 660). Setting of the buttons is saved when ZAMS is closed. |
| **Delete all** (red X) | Clears the whole table. |
| **Error** (white x in a red circle) | Displays the number of errors that can be displayed in the table. Clicking on the button switches the display in the table on or off. |
| **Warnings** (yellow triangle) | Displays the number of warnings that can be displayed in the table. Clicking on the button switches the display in the table on or off. |
| **Messages** (blue circle) | Displays the number of messages that can be displayed in the table. Clicking on the button switches the display in the table on or off. |
| **Table** | Contains error messages, warnings and information.<br>▸ Messages can be sorted with the column titles and according to columns. Clicking on the respective column head sorts the table |

| Option | Description |
|---|---|
| | according to this column. A second click inverts the sorting. The standard sorting increases in accordance with column 1 **(Numbering)**.<br>▸ Double clicking on a message in the table displays the report and the context in which the message was created in the report area of the main window. To do this, the report must already be open.<br>▸ Messages are deleted when ZAMS is closed. |
| **Numbering** | Contains consecutive numbering. The numbers are assigned chronologically upon receipt. |
| **Symbol** | Symbol that displays the type of message. The symbols correspond to the symbols of the buttons.<br>Sorting sequence ascending:<br>▸ Error<br>▸ Warning<br>▸ Information<br>Descendant sorting is carried out in reverse order. |
| **Timestamp** | Displays the time stamp at which the message was created. |
| **Message ID** | Unique ID of the message source. |
| **Description** | Explanation of the message. |

# 42 Configuration

Configuration of migration takes place in individual steps:

- Connect to Servers (on page 664)
- General settings (on page 670)
- Linked Servers (on page 676)
- Databases (on page 681)
- Schedules (on page 691)
- Reports and Subscriptions (on page 693)

- Summary (on page 697)
- Migrating (on page 699)

The process is gone through with the **Back** and **Next** buttons. Individual steps cannot be called up directly. Switching forwards and backwards is only possible if the current step has been validated positively.

## 42.1 Connect to Servers

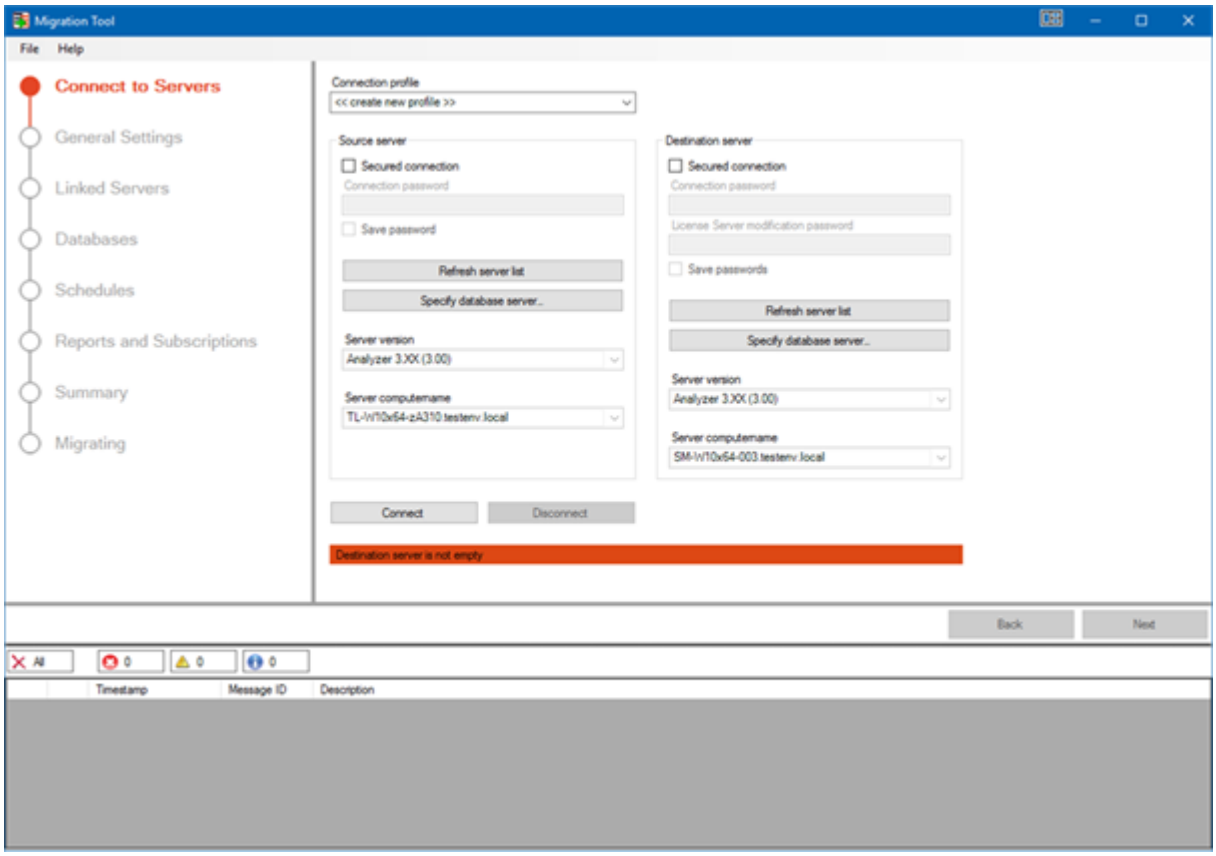
In this step, you configure the connection to the source server and to the target sever for the migration.

To establish a connection:

1. Configure computer, Analyzer version and login data for the source server.
2. Configure computer, Analyzer version and login data for the target server.
3. Establish the connection by clicking on the **Connect** button.

> **Information**
>
> If an error occurs when activating the connection security, you receive further information in relation to this in the output window under error number *86*.

## CONNECT DIALOG TO SERVER




### CONNECTION PROFILE

| Option | Description |
|---|---|
| **Connection profile** | Selection of an existing connection profile for connection or the creation of a new profile.<br>When selecting a new profile, the entries of the previous profile are retained and can be edited.<br>Only available if there is no connection.<br>The connection profiles are managed in the options (on page 657). |

### SOURCE SERVER

| Option | Description |
|---|---|
| **Source server** | Configuration of a new connection. The options are only available if a new connection profile is created and there is no connection. |

| Option | Description |
|---|---|
| | **Note:** The options **Password** and **User name** are only available if the **Use Windows authentication** option has been deactivated. |
| **Connection security** | Settings for the connection security (on page 82). The entries must correspond to the configuration on the server.<br>Only available if the selected server version allows secure connections. |
| **Secured connection** | Activation or deactivation of the encrypted communication.<br>▸ *Active*: Communication is encrypted. For each connection, depending on the degree of encryption, passwords must be entered for the license service.<br>▸ *Inactive*: Communication is not encrypted.<br>**Note:** Secured communication cannot be configured for existing connection profiles. A new profile must be created. |
| **License Server connection password** | Entry of the password for the connection to the license server. Input is always hidden. The actual length is disguised. If the input field is active, it must be filled in order for a connection to be established. |
| **Save passwords** | Stipulation of whether the connection parameters are saved in the connection profile.<br>Saving is carried out as a hardware-dependent and user-dependent hash of the password. |
| **Refresh server list** | Clicking on the button starts the search for source servers that can be accessed with the login data.<br>The drop-down list to select a server is filled with the results.<br>Only available if the **Use shared credentials** option has been deactivated. |
| **Specify database server** | Clicking on the button opens the **dialog** (on page 669) for manual entry of a source server. |
| **Server version** | Selection of the main Analyzer version of the source server from a drop-down list.<br>The list is filled with the results of the search or manual entry. With a secure connection, only versions that support a secure connection are offered. |

| Option | Description |
|---|---|
| **Server computername** | Selection of the computer name from a drop-down list.<br>The list is filled with the results of the search or manual entry. |

### DESTINATION SERVER

| Option | Description |
|---|---|
| **Destination server** | Configuration of a new connection. The options are only available if a new connection profile is created and there is no connection.<br><br>**Note:** The options **Password** and **User name** are only available if the **Use Windows authentication** option has been deactivated. |
| **Connection security** | Settings for the connection security (on page 82). The entries must correspond to the configuration on the server.<br><br>Only available if the selected server version allows secure connections. |
| **Secured connection** | Activation or deactivation of the encrypted communication.<br><br>▸ *Active*: Communication is encrypted. For each connection, depending on the degree of encryption, passwords must be entered for the license service.<br><br>▸ *Inactive*: Communication is not encrypted.<br><br>**Note:** Secured communication cannot be configured for existing connection profiles. A new profile must be created. |
| **License Server connection password** | Entry of the password for the connection to the license server. Input is always hidden. The actual length is disguised. If the input field is active, it must be filled in order for a connection to be established. |
| **License Server modification password** | Entry of the change password on the license server.<br>Entry is always hidden. The actual length is disguised. If the input field is active, it must be filled in order for a connection to be established. |
| **Save passwords** | Stipulation of whether the connection parameters are saved in the connection profile.<br>Saving is carried out as a hardware-dependent and user-dependent hash of the password. |

| Option | Description |
|---|---|
| **Refresh server list** | Clicking on the button starts the search for target servers that can be accessed with the login data.<br>The drop-down list to select a server is filled with the results.<br>Only available if the **Use shared credentials** option has been deactivated. |
| **Specify database server** | Clicking on the button opens the **dialog** (on page 669) for manual entry of a target server. |
| **Server version** | Selection of the main Analyzer version of the target server from a drop-down list.<br>The list is filled with the results of the search or manual entry.<br>With a secure connection, only versions that support a secure connection are offered. |
| **Server computername** | Selection of the computer name from a drop-down list.<br>The list is filled with the results of the search or manual entry. |

### CONNECTION

| Option | Description |
|---|---|
| **Connect** | Clicking on the button starts the establishment of the connection with the configured connection data<br>The result is shown under the button as text information. |
| **Disconnect** | Clicking on the button disconnects the existing connection.<br>The result is shown under the button as text information. |
| **Text information** | Shows the current connection status of the migration tool. In addition, the background color of the information is set according to the connection status. |

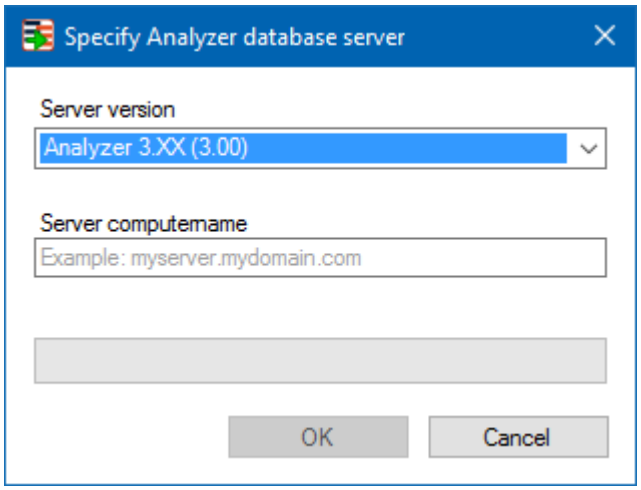
### NAVIGATION AND OUTPUT WINDOWS

| Property | Description |
|---|---|
| **Navigation** | Navigation (on page 660) in the configuration steps by means of the **Back** and **Next** buttons.<br>▸ **Back**: One step back.<br>Only available if not the first or last step.<br>▸ **Next**: One step further. |

| Property | Description |
|---|---|
| | Only available if the validation for the current configuration has been completed successfully.<br>This button is replaced:<br>In the **Overview of migration** step by **Start migration**.<br>In the **Migration is taking place** by **New migration**. |
| **Output window** | Display (on page 662) of errors, warnings and notifications. |

## 42.1.1 Specify database server

Source and target server for the migration can be configured manually. Clicking on the **Specify Database Server** button in the **Connect to server** step opens the dialog to enter the Analyzer version and name of the server.




| Option | Description |
|---|---|
| **Server version** | Select the main version of the Analyzer server from a drop-down list. |
| **Server computername** | Entry of the name of the computer on which the Analyzer server runs.<br><br>A certificate must be installed for secure connections. This demands the server name as an **FQDN** (**Fully Qualified Domain Name**).<br><br>▸ Example of insecure: **myserver**<br>▸ Example of secure: **myserver.mydomain.com**<br><br>**Note:** **localhost** is not a valid entry, because localhost is |

| Option | Description |
|---|---|
| | unknown in the domain. localhost is always replaced by the computer name. |
| **Progress bar** | Shows the validation progress and any errors that are found. |
| **OK** | Starts process when entering a server. If this is successful, the dialog is closed and the changes are saved. |
| **Cancel** | Discards all changes and closes the dialog. |

## 42.2 General settings

In this step, you configure the general settings for the migration:

- Access rights for tools:
  - Manual Data Editor
  - Metadata Editor
  - ZAMS

  **Note:** The source server and target server must be higher than version 2.00, because these access rights are not available for version 2.00.
- Access rights on the Analyzer Server:
  Basic access rights to web services and Report Launcher. Assignment of the roles for users and administrators.
- SMTP settings on the Analyzer Server:
  Migration of the SMTP settings for report dispatch by email.

  **Note:** These settings can only be migrated if the following components are running on the same server:
  - Source server
  - Destination server
  - Migration tool
- **Reporting Services wake up call**

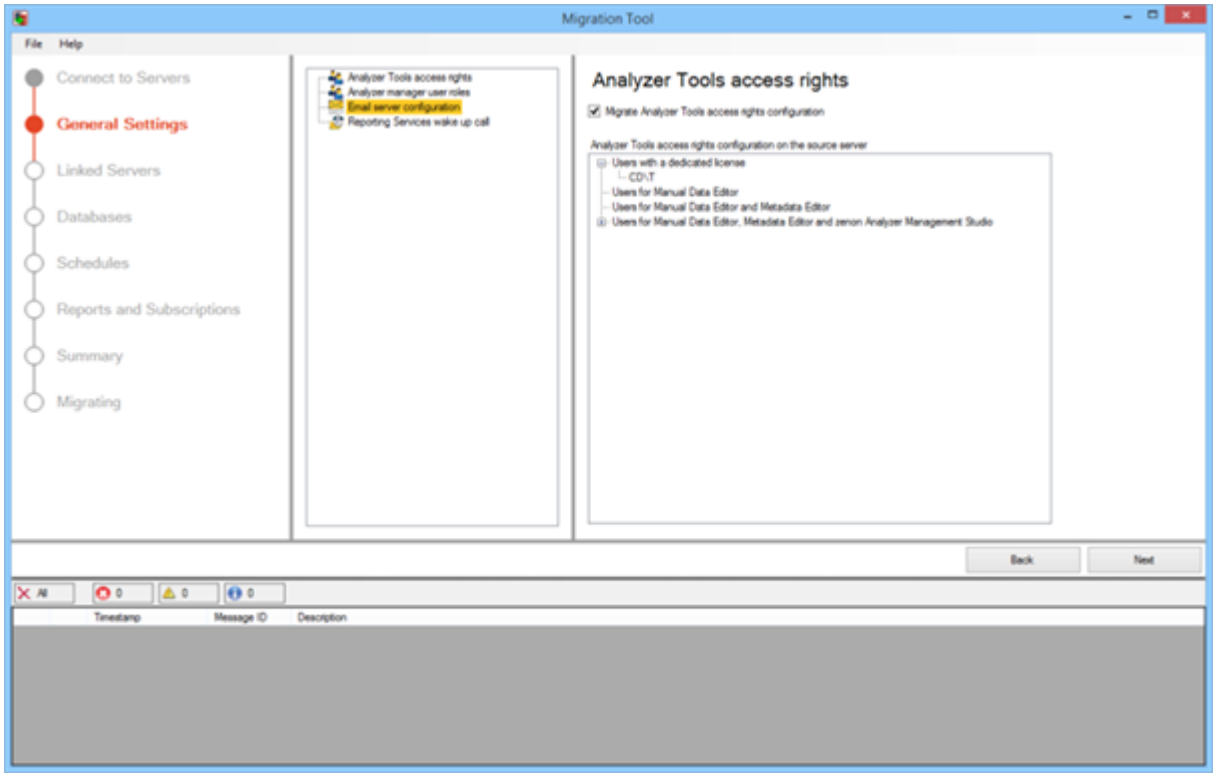
## Information

Members of the local administrators in the **<PREDEFINED>\Administrators** group cannot be migrated.

Background: This group is created by the operating system. It may get different names, depending on the operating system, language and other factors. It cannot therefore be clearly identified from the migration process.

In the **Diagnosis Viewer**, you get the error message **E00060** in any case: Setting the access rights in the SQL Server Reporting Services on [computer] for [version] has failed.

## CONFIGURATION




### SELECTION

| Option | Description |
|---|---|
| **Step display** | Display of the step to be configured. |
| **Selection tree** | Display and selection of the components to be configured. |
| **Detail view** | Display of the status and configuration of the selected object. |

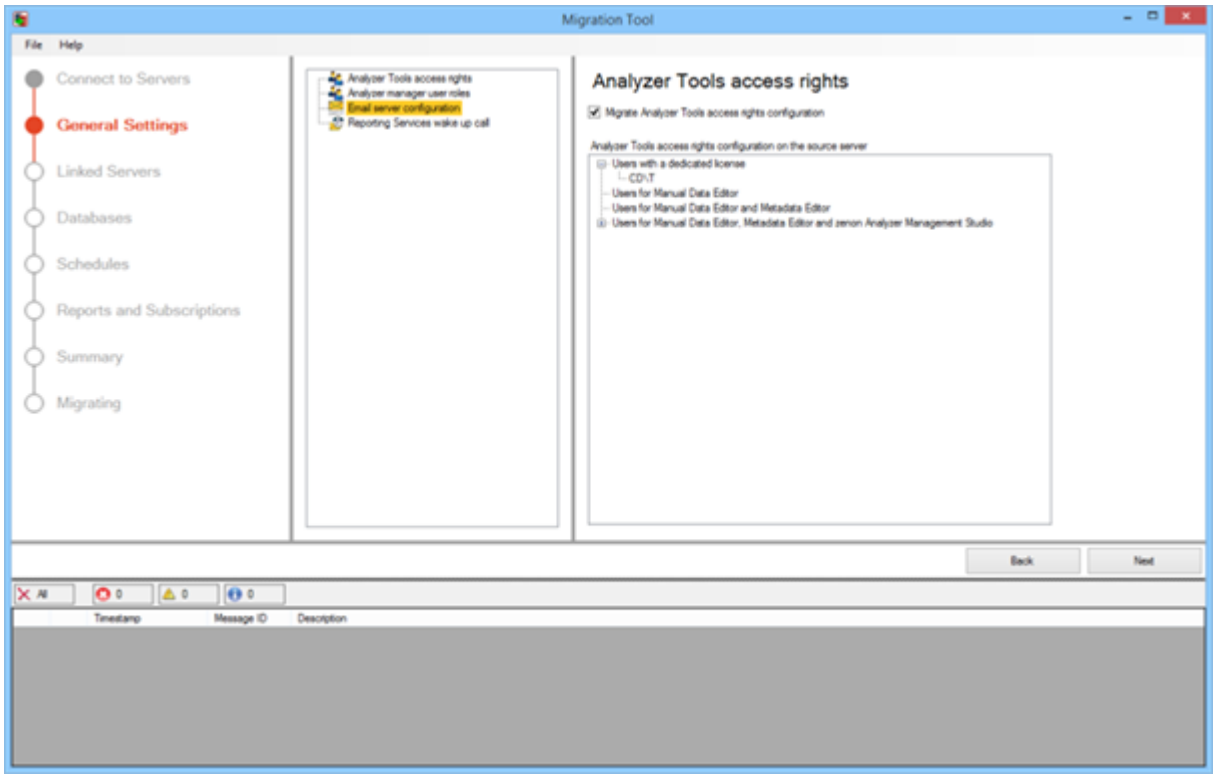
| Option | Description |
|---|---|
| | Information is shown with a yellow background if the object cannot be migrated.<br><br>If the object can be migrated, the checkbox for activation of the migration and the objects to be migrated are shown.<br><br>Configuration:<br><br>▸ **Checkbox**<br>*active*: Object is to be migrated.<br>*Inactive*: Object is not migrated.<br><br>▸ **Detail window**: Display of the configuration to be migrated on the source server or notes on the current configuration on the target server.<br><br>For details, see the following sections.<br><br>▸ **Analyzer application access rights**<br>▸ **Report Launcher user roles**<br>▸ **Email server configuration**<br>▸ **Reporting Services wake up call** |

### NAVIGATION AND OUTPUT WINDOWS

| Property | Description |
|---|---|
| **Navigation** | Navigation (on page 660) in the configuration steps by means of the **Back** and **Next** buttons.<br><br>▸ **Back**: One step back.<br>Only available if not the first or last step.<br><br>▸ **Next**: One step further.<br>Only available if the validation for the current configuration has been completed successfully.<br>This button is replaced:<br>In the **Overview of migration** step by **Start migration**.<br>In the **Migration is taking place** by **New migration**. |
| **Output window** | Display (on page 662) of errors, warnings and notifications. |

## ANALYZER APPLICATION ACCESS RIGHTS

Settings for the migration of the access rights for Analyzer applications.

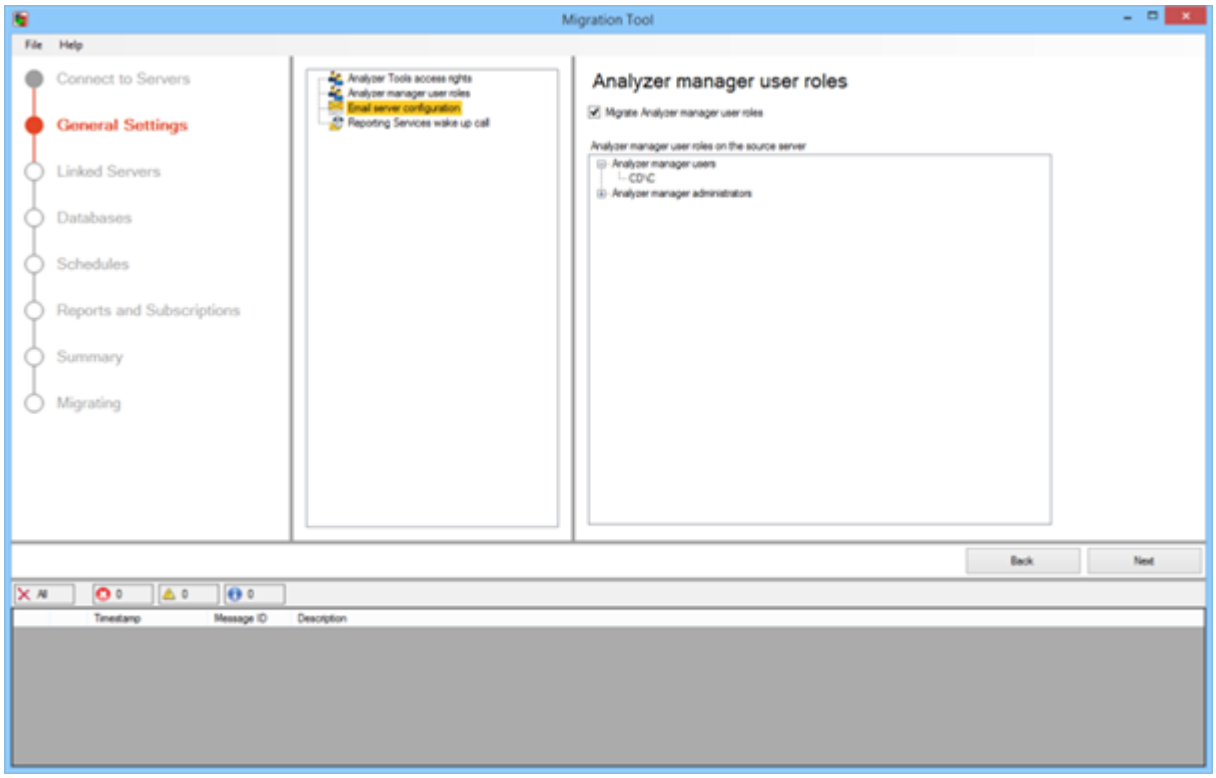



To migrate the access rights for Analyzer applications:

1. Select the **Access rights for the Analyzer applications** entry in the selection tree.
2. Activate the **Migrate Analyzer Tools access rights configuration** checkbox.
3. Check the objects to be migrated in the detail window.

## REPORT LAUNCHER USER ROLES

Settings for the migration of the Report Launcher user roles.



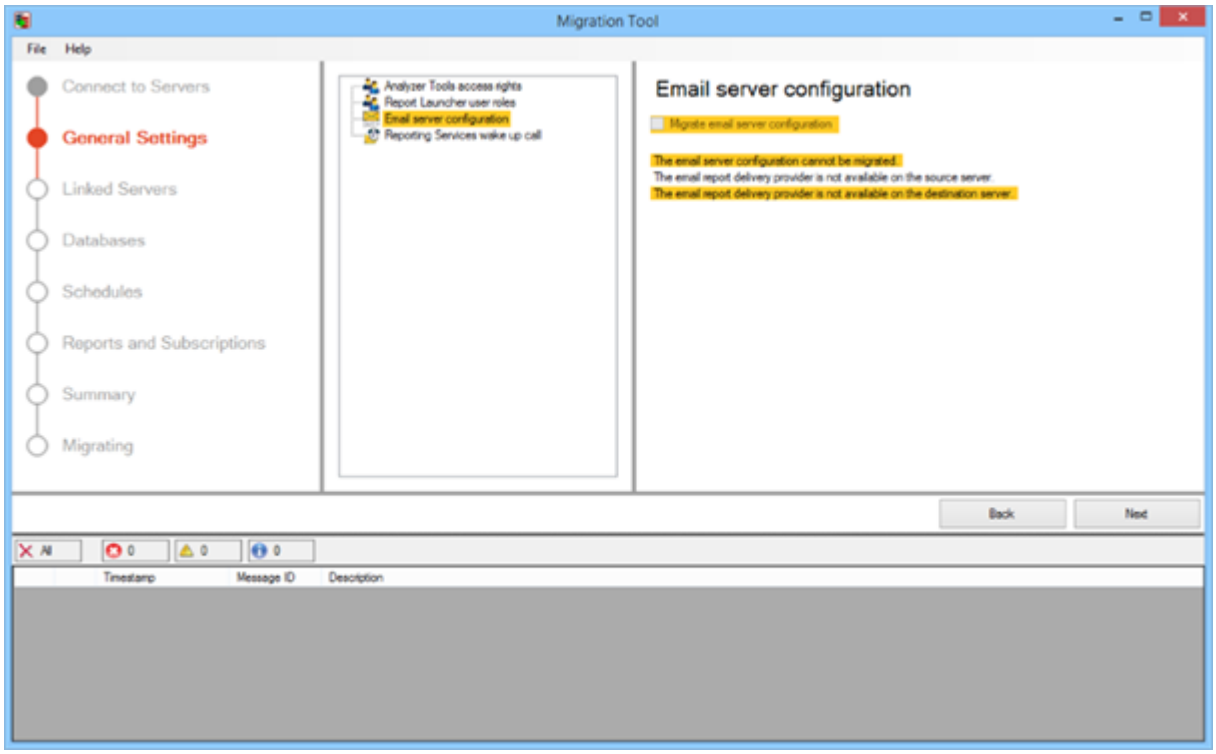

To migrate the user roles:

1. In the selection tree, select the **Report Launcher user roles** entry.
2. Tick the **Migrate Report Launcher user roles** checkbox.

   **Note:** If the migration of the user roles is deactivated, the access rights to individual objects on the Analyzer server (folders, reports etc.) cannot be migrated. A corresponding warning is displayed.
3. Check the objects to be migrated in the detail window.

## EMAIL SERVER CONFIGURATION

Settings for the migration of the email server configuration.




To migrate the email server configuration:

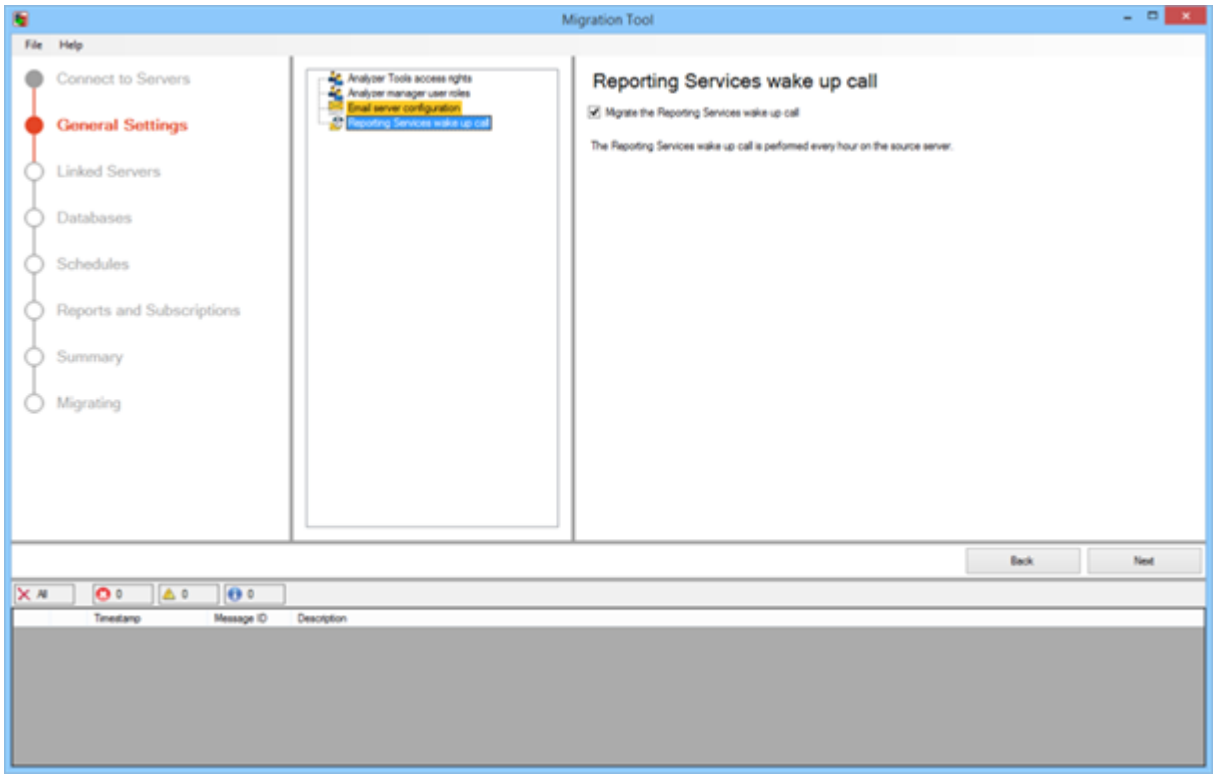
1. Select the **Email server configuration** entry in the selection tree.
2. Activate the **Migrate email server configuration** checkbox.
3. In the detail window, check the SMTP configuration on the source server and the status of the email report sending expansion on the target server.

If the migration of the SMTP configuration has been deactivated by the user, the availability of the email report sending expansion is shown in the target server.

- Email subscriptions can be migrated if the expansion is available.
- If the expansion is not available, the migration of email subscriptions is not possible. A corresponding warning is displayed.

### REPORTING SERVICES WAKE UP CALL

Settings for the migration of the Reporting Services activation call.




To migrate a **Reporting Services activation call** configured on the source server:

1. Select **Reporting Services activation call** in the selection tree.
2. Tick the **Migrate the Reporting Services activation call** checkbox.
   **Note:** This is only available if the call exists on the source server and there is no communication error.
3. Note the status report. This provides information on the migrateability and parameters of the activation call.

## 42.3 Linked Servers

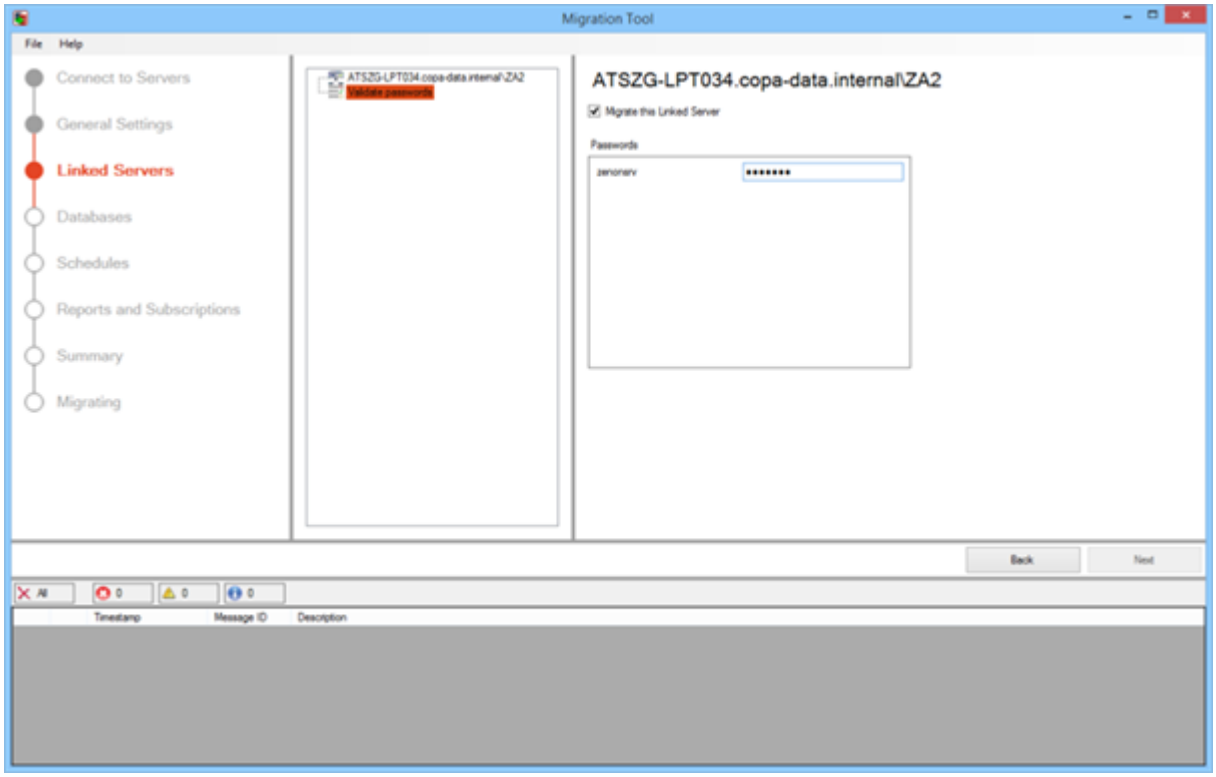
in this step, you configure the settings for the migration of the Linked Servers.

The Linked Server information with the attendant provider information is read from the source server. In order for a Linked Server to be able to be migrated, the following conditions must be met:

- The attendant provider already exists on the target server.
  This means: There is a provider on the target server with the same name and identical configuration.
- A valid password is stored for each required user.

- The passwords have been validated successfully.

## CONFIGURATION




### SELECTION IN THE SELECTION TREE

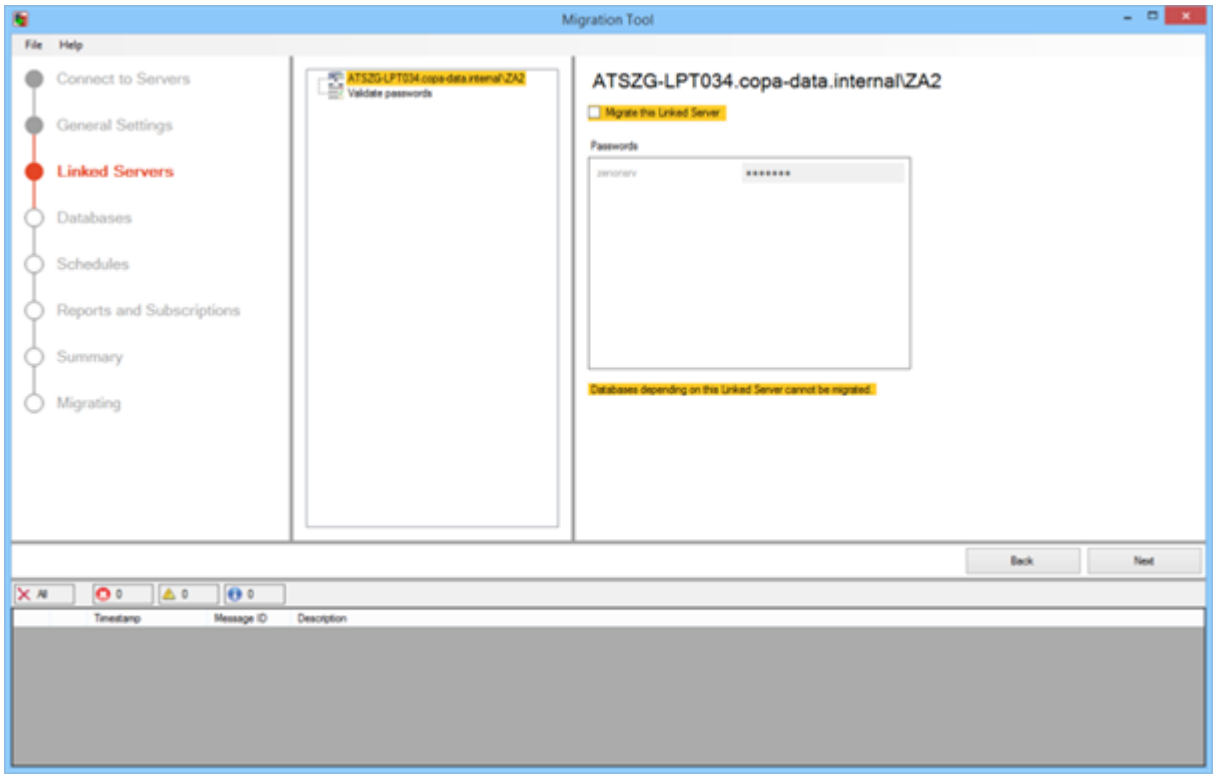
| Option | Description |
|---|---|
| **Step display** | |
| **[Linked server name]** | Display and selection of the Linked-Server to be configured.<br>Clicking on a server offers the option to configure the selected Linked Servers in the detail view.<br>Status colors:<br>- *Yellow*: Linked Server is not selected for migration.<br>- *Red*: Linked Server is selected for migration and cannot be migrated. |
| **Validate passwords** | Start of validation and display of the validation status of the passwords. |

| Option | Description |
|---|---|
| | Status colors:<br>▸ *Red*: At least one password has not yet been validated. |

### SERVER CONFIGURATION

| Option | Description |
|---|---|
| **Title** | Name of the Linked Servers that is configured.<br>If there is configurable content, information is shown accordingly. |
| **Migrate this Linked Server** | Checkbox to select whether the server is migrated:<br>▸ *Active*: This Linked Server is to be migrated.<br>▸ *Inactive*: This Linked Server is not migrated.<br>**Note:** If Linked Servers are excluded from migration, this can lead to problems in the migration process.<br>Status colors:<br>▸ *Yellow*: Not selected for migration.<br>▸ Red: Server is selected and cannot be migrated with the current configuration.<br>Text information on the status may be shown below the password field. |
| **Passwords** | Entry of the password for the user who is needed to create the linked server on the target server.<br>Note: If the computer is in a different domain, the path must be given as a **Fully Qualified Domain Name**.<br>Status colors:<br>▸ *Red*: no password entered |
| **Text information** | Display of notices in the event of configuration problems. |

Migration view deselected:




## VALIDATE PASSWORDS

You start validation of the passwords entered in the **Check passwords** detail area. Linked Server can only be migrated if all configured connections have the correct password.

To set and check the passwords:

1. Issue the required passwords for each Linked Server to be migrated.

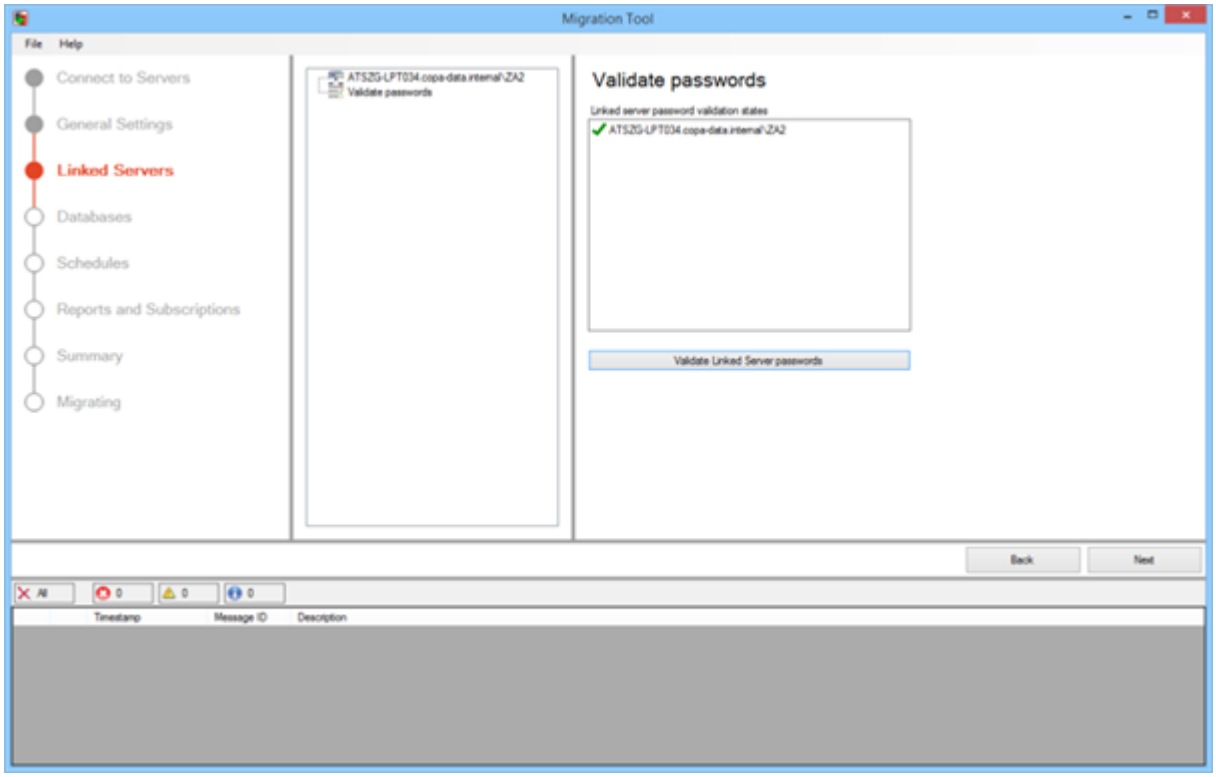
   Servers that are selected for migration but do not have a valid password are displayed as saved in red.

2. Click on the **Check passwords for linked servers** button.

   The passwords are checked.

   The result is shown in the list with the checking status.

**Attention:** If a password that has already been validated is amended, the validation must be carried out again.




| Option | Description |
|---|---|
| **Linked server password validation states** | Display of the validation result for all configured Linked Servers:<br>▸ Green check mark: Validation successful<br>▸ Magnifying glass: Validation not carried out<br>▸ Red circle: Validation failed |
| **Validate Linked Server passwords** | Clicking on the button starts the validation process.<br>The results are displayed on the list with the checking status. |

## NAVIGATION AND OUTPUT WINDOWS

| Property | Description |
|---|---|
| **Navigation** | Navigation (on page 660) in the configuration steps by means of the **Back** and **Next** buttons.<br>▸ **Back**: One step back.<br>Only available if not the first or last step.<br>▸ **Next**: One step further.<br>Only available if the validation for the current configuration |

| Property | Description |
|---|---|
| | has been completed successfully.<br>This button is replaced:<br>In the **Overview of migration** step by **Start migration**.<br>In the **Migration is taking place** by **New migration**. |
| **Output window** | Display (on page 662) of errors, warnings and notifications. |

## 42.4 Databases

In this step, you configure the settings for the migration of the databases:

- Paths for databases backup files
- Migratable databases
- Database backup jobs
- Jobs for the retraining of prediction models

### CONFIGURATION

To configure the databases for the migration:

1. Select the **Database** entry in the selection tree.
2. Select the desired object in the detail view.
   The status of a task is displayed in the detail window using messages and signal colors.
   - Paths for database backup files:
     Clicking on the object shows the input elements for necessary paths in the detail view. The worst validation results of a path are shown as a status color.
   - Databases to be migrated:
     Clicking on the object shows the input elements for database migration in the detail view. Each sub-element represents a database available for migration. The color of the sub-element shows the status of the database:
     *Red*: Necessary paths missing.
     *Yellow*: Cannot be migrated due to dependencies or is not selected for migration.
   - Database backup jobs on the source server:
     Clicking on the object shows the input objects for database backup jobs in the detail view. Each sub-element represents all database backup jobs available for migration on the source server. The status color is the status color of the worst sub-element. The color of the sub-element shows the status of the database backup job:
     *Red*: Necessary paths missing.
     *Yellow*: Cannot be migrated due to dependencies or is not selected for migration.

3. Configure the selected objects in the detail window.

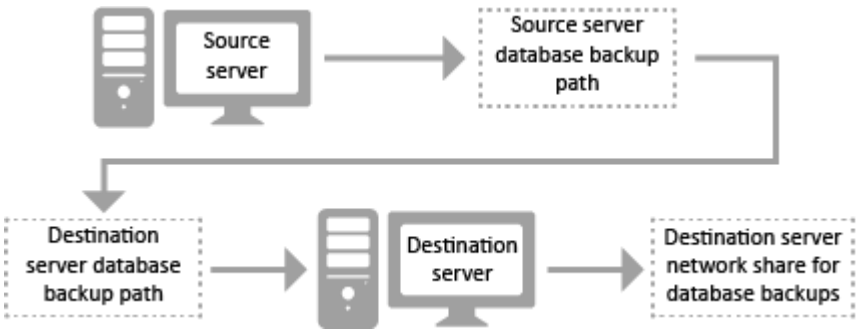
> **Information**
>
> The demo database supplied by COPA-DATA cannot be migrated. Databases, database backup jobs, reports and subscriptions that are based on the demo database also cannot be migrated.
>
> Databases that cannot be migrated are displayed in the tree with yellow highlighting.

### PROCEDURE

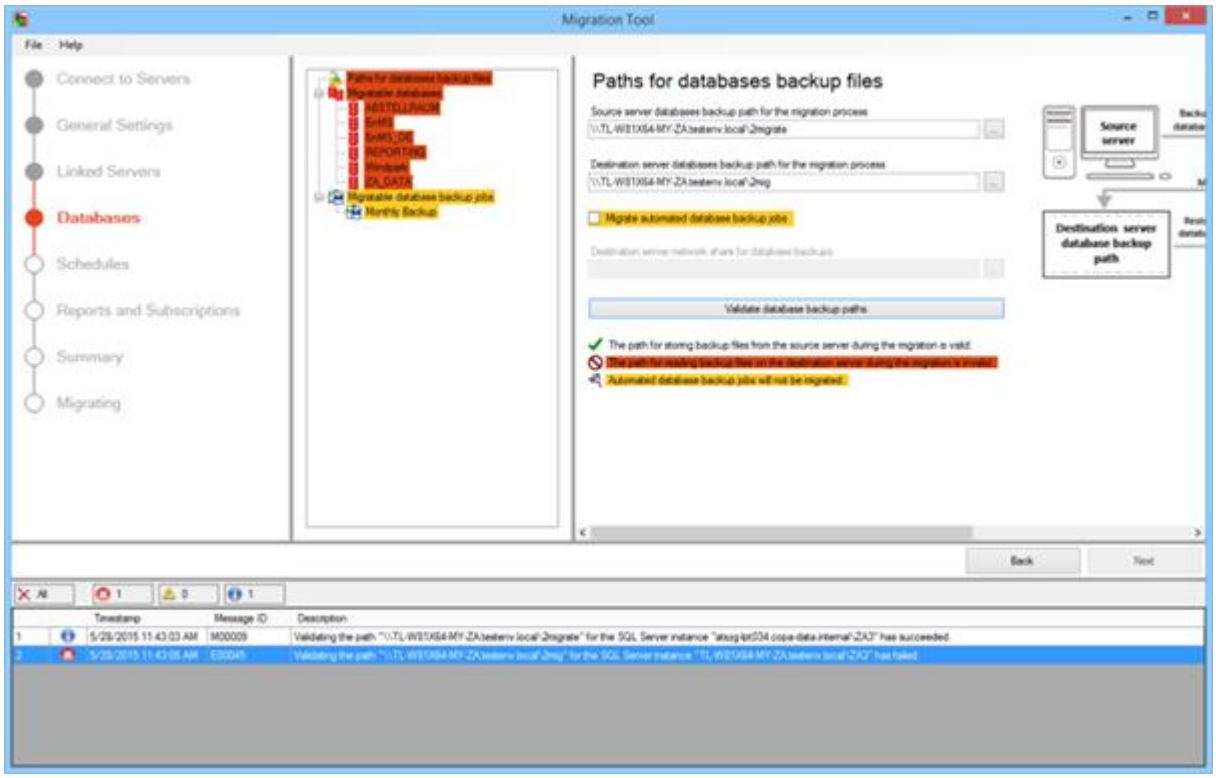
The process for the migration of the databases is as follows:

- The databases of the source server are saved in a defined folder.
- The databases are moved from the backup folder to a backup folder for the target server.

  This step is not necessary if the two backup folders are identical.
- The databases are restored again on the target server.
- Database backup jobs are set up again on the target server.



## PATHS FOR DATABASES BACKUP FILES

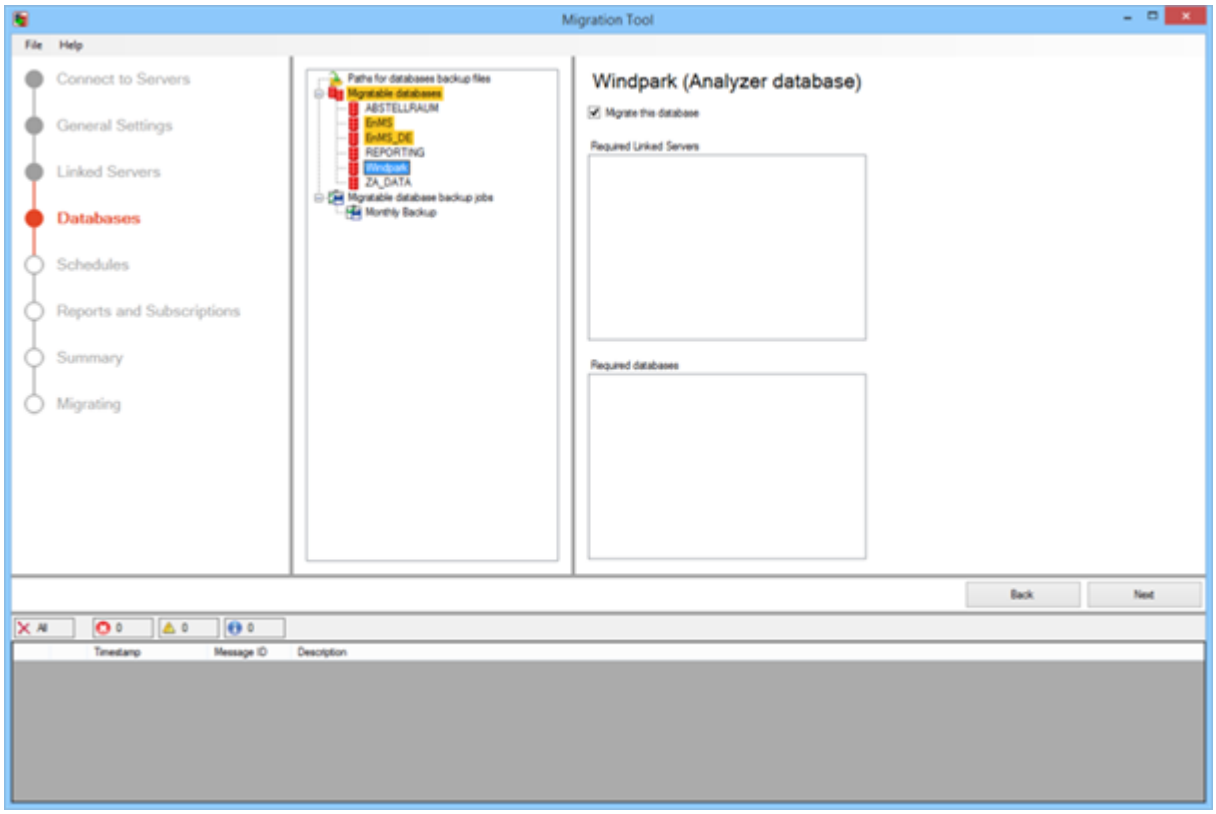



### PATHS FOR DATABASES BACKUP FILES

| Option | Description |
|---|---|
| **Paths for databases backup files** | Settings for the database paths for migration. |
| **Source server databases backup path for the migration process** | Entry of the database backup path for the migration process on the source server.<br><br>When carrying out the migration, the databases in this path are saved by the source server.<br><br>Click the ... button and the dialog opens to select a path. The path can also be entered directly into the field as a UNC network path. Syntax: **\\Computer name\folder\subfolder**<br><br>**Note:** This field is a mandatory field for migration. |
| **Destination server databases backup path for the migration process** | Entry of the database backup path for the migration process on the target server.<br><br>When carrying out the migration, the database backup files are moved to this path from the path on the source server and then restored by the target server from this path. The files are deleted |

| Option | Description |
|---|---|
| | afterwards.<br><br>Click the ... button and a dialog opens to select a path. The path can also be entered directly into the field as a UNC network path. Syntax: **\\Computer name\folder\subfolder**<br><br>**Note:** This field is a mandatory field for migration. |
| **Migrate automated database backup jobs** | Stipulation of whether database backup jobs are to be migrated.<br>▸ *Active*: Database backup jobs will be migrated A valid path must be issued in the **Network enabling on the target server to save database backups**.<br>▸ *Inactive*: Database backup jobs will not be migrated. Status color: yellow |
| **Destination server network share for database backups** | Entry of the path to an enabled folder on the target server in which database backup jobs can be saved.<br><br>Click the ... button and a dialog opens to select a path. The path can also be entered directly into the field as a UNC network path. Syntax: **\\Computer name\folder\subfolder**<br><br>Only available if the **Migrate automated database backup jobs** option has been activated. |
| **Validation of the database backup paths** | Click on the button to start validation of the configured paths. If the result is positive, the button to move forward in the process is enabled. |
| **Status display** | The status of the ability to migrate is displayed below the button for validation via symbols and messages:<br>▸ Green check mark: Validation successful<br>▸ Magnifying glass: Validation not carried out<br>▸ Red circle: Validation failed<br><br>A written message informs you of the reason for the respective status. |

## SELECTION OF DATABASES




### DATABASE SELECTION

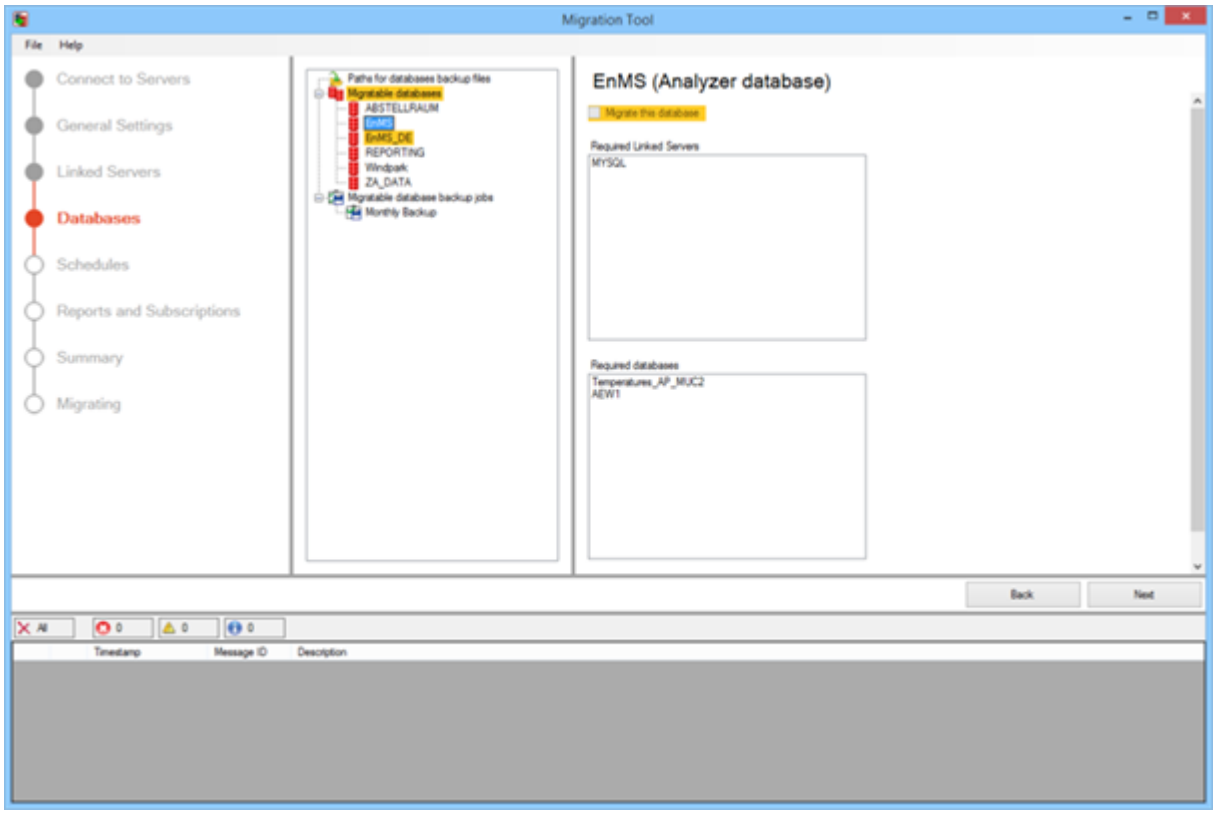
| Option | Description |
|---|---|
| **Title** | Name and type of database.<br><br>For example: Reporting **(**Analyzer **database)** |
| **Migrate this database** | Configuration of whether this database is to be migrated. Only available if the database can be migrated. A database can be migrated if the necessary paths for the migration process have been validated successfully and all dependencies are migrated.<br>▸ *Active*: Database is to be migrated.<br>▸ *Inactive*: Database is not migrated.<br>Status color: *yellow* |
| **Required Linked Servers** | Shows all Linked Servers that depend on this database.<br>A database can only be migrated if all Linked Servers on which it depends are migrated. |
| **Required databases** | Shows all databases on which this database is dependent. A database can only be migrated if all databases on which it depends |

| Option | Description |
|---|---|
| | are migrated.<br><br>Display only available for Analyzer databases. |
| **Status** | Status display. Only available if a database is not migrated.<br><br>Text shows reason for non-migration and informs you, in the case of Analyzer databases, if these are not migrated.<br><br>Status colors:<br>▸ *Red*: Paths missing.<br>▸ *Yellow*: All other notices. |

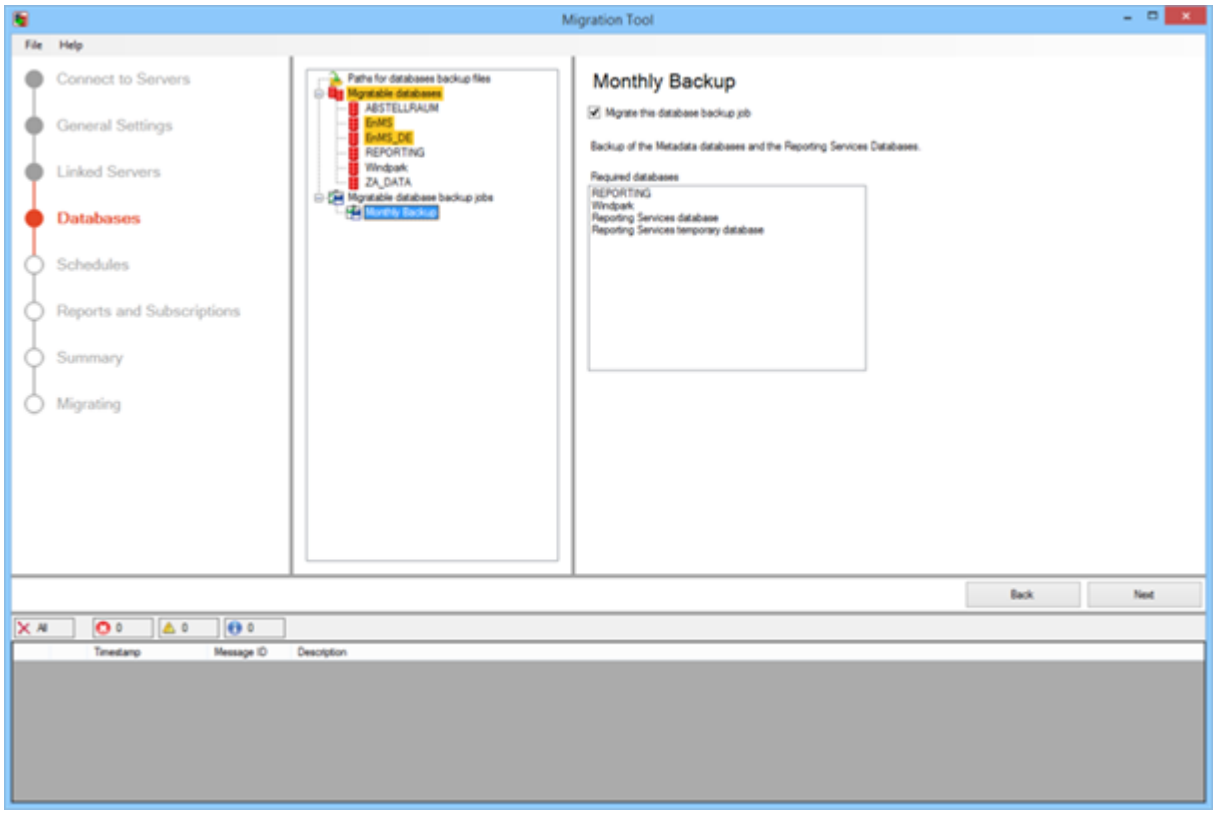
### NAVIGATION AND OUTPUT WINDOWS

| Property | Description |
|---|---|
| **Navigation** | Navigation (on page 660) in the configuration steps by means of the **Back** and **Next** buttons.<br>▸ **Back**: One step back.<br>Only available if not the first or last step.<br>▸ **Next**: One step further.<br>Only available if the validation for the current configuration has been completed successfully.<br>This button is replaced:<br>In the **Overview of migration** step by **Start migration**.<br>In the **Migration is taking place** by **New migration**. |
| **Output window** | Display (on page 662) of errors, warnings and notifications. |

Database view is not migrated:



## PATHS FOR DATABASES BACKUP FILES




| Option | Description |
|---|---|
| **Title** | Database backup job name |
| **Migrate this database backup job** | Configuration of whether this database backup job is to be migrated. Only available if the backup job can be migrated. A database backup can be migrated if the path for database backup jobs on the target server has been successfully validated and all dependencies have been migrated.<br>▸ *Active*: Database backup job is to be migrated.<br>▸ *Inactive*: Database backup job is not migrated. Status color: *yellow* |
| **Text** | Database backup job description |
| **Required databases** | List of all databases on which this database backup job depends. A database backup job can only be migrated if all databases on which it depends are migrated. |
| **Status** | Status display. Only available if a database backup job is not migrated. |

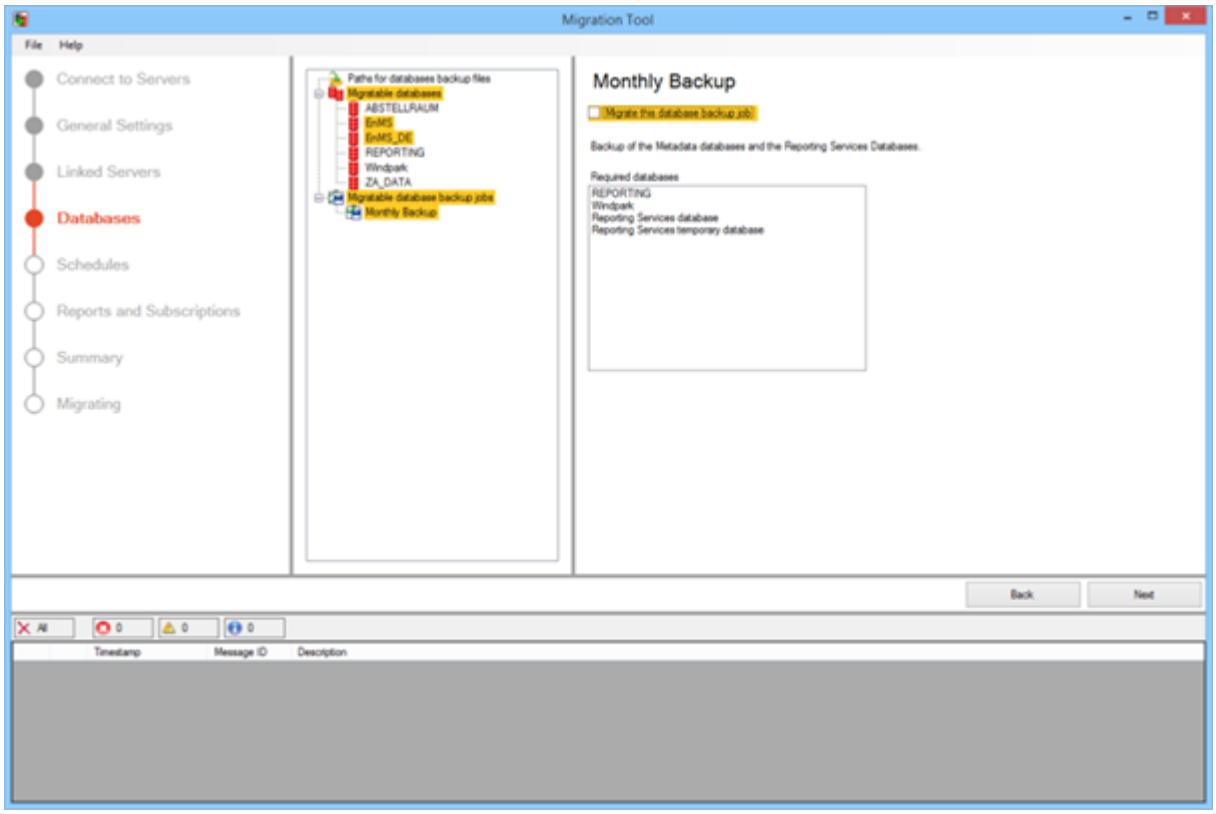
| Option | Description |
|---|---|
| | Text shows reason for non-migration.<br>Status colors:<br>▸ *Red*: Paths missing.<br>▸ *Yellow*: All other notices. |

**Attention:** If a database included in a database backup job no longer exists, this job can no longer be migrated.

### NAVIGATION AND OUTPUT WINDOWS

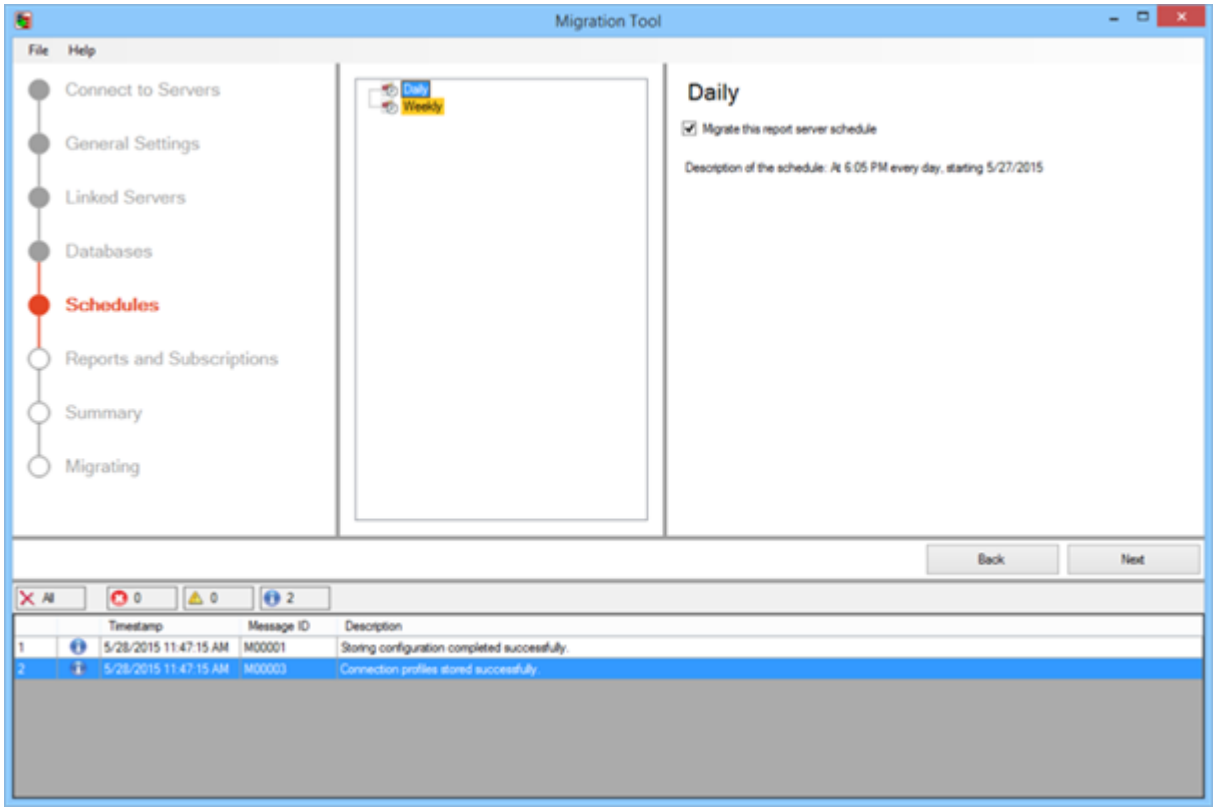
| Property | Description |
|---|---|
| **Navigation** | Navigation (on page 660) in the configuration steps by means of the **Back** and **Next** buttons.<br>▸ **Back**: One step back.<br>Only available if not the first or last step.<br>▸ **Next**: One step further.<br>Only available if the validation for the current configuration has been completed successfully.<br>This button is replaced:<br>In the **Overview of migration** step by **Start migration**.<br>In the **Migration is taking place** by **New migration**. |
| **Output window** | Display (on page 662) of errors, warnings and notifications. |

View of invalid configuration:



## 42.5 Schedules

In this step, you configure the settings for the migration of the schedules.




### SELECTION IN THE SELECTION TREE

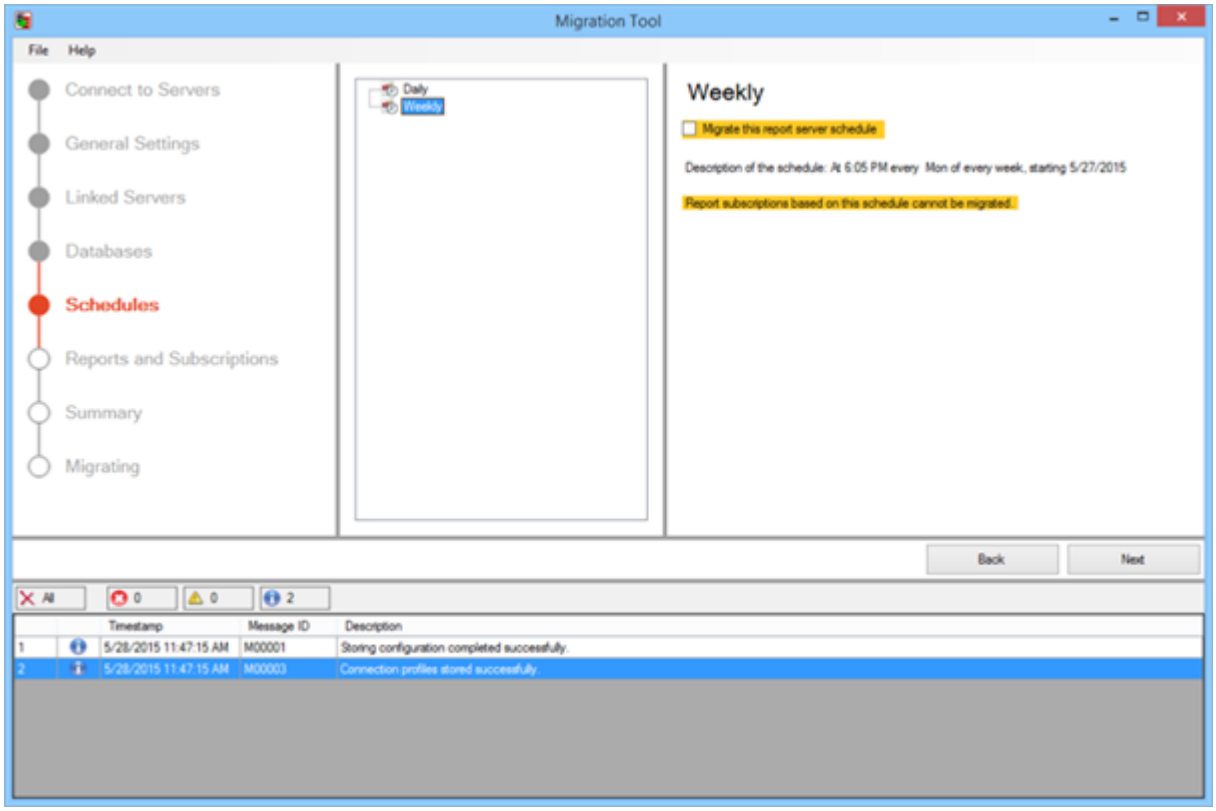
| Option | Description |
|---|---|
| **Step display** | Display of the step to be configured. |
| **Selection tree** | Display and selection of the schedules to be configured.<br><br>Clicking on the schedule offers options for the configuration of the selected schedule in the detail view.<br><br>Status colors:<br><br>▸ *Yellow*:<br>Schedule is not selected for migration. |

### CONFIGURATION IN DETAIL VIEW

| Option | Description |
|---|---|
| **Title** | Name of the schedule that is configured. |

| Option | Description |
|---|---|
| | If there is configurable content, information is shown accordingly. |
| **Migrate report server schedule** | Checkbox to select whether the schedule is migrated:<br>▸ *Active*: This schedule is to be migrated.<br>▸ *Inactive*: This schedule is not migrated.<br>Status colors:<br>▸ *Yellow*: Not selected for migration. |
| **Text information** | Display of:<br>▸ Description of the schedule.<br>▸ Notes on the migration of subscriptions if the schedule is not migrated. |

Migration view deselected:



## 42.6 Reports and Subscriptions

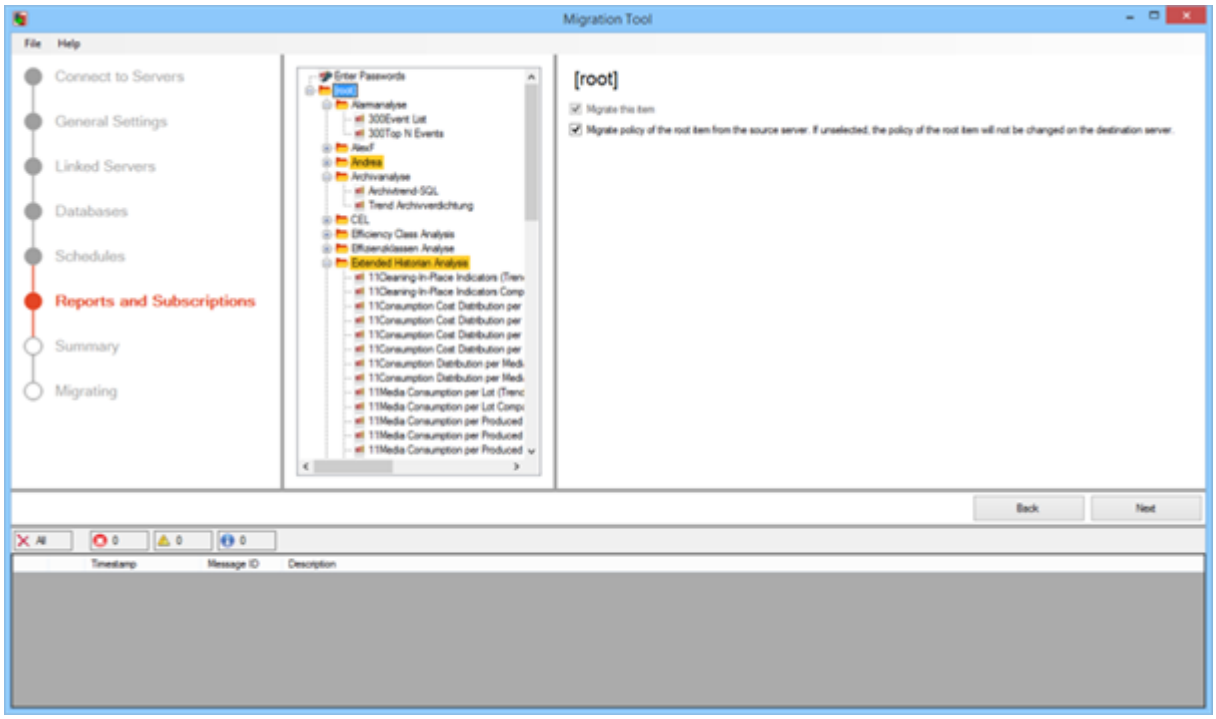
In this step, you configure the settings for the migration of reports and subscriptions. Reports and subscriptions that are not migrated or cannot be migrated are highlighted in yellow. Note the dependency when migrating subscriptions for reports and passwords.

### STANDARD CONFIGURATION

To migrate all elements in the **Root**:

1. Tick the **Migrate this object** checkbox.

   **Note:** At least one object must be able to be migrated
2. Select the configuration for **Migrate policy of the root item from the source server**.
3. Enter the required passwords in the **Enter passwords** node.




| Option | Description |
|---|---|
| **Step display** | Display of the step to be configured. |
| **Selection tree** | Lists all reports available in Report Launcher.<br><br>In addition, the subscriptions configured for each report are displayed.<br><br>The **Enter password** node allows the input of all passwords required for the provision of passwords. Only present if there are |

| Option | Description |
|---|---|
| | subscriptions. |
| **Title** | Shows name **[root]**. |
| **Migrate this item** | Configuration of whether object is migrated.<br>▸ *Active*: All objects in the root folder that can be migrated are highlighted for migration.<br>▸ *Inactive*: No objects are migrated.<br>**Status colors:**<br>▸ *Yellow*: Object has not been selected for migration or cannot be migrated due to dependencies. |
| **Migrate policy of the root item from the source server.** | Configuration for acceptance of authorizations.<br>▸ *Active*: Authorization of the root element on the source server is transferred to target server.<br>▸ *Inactive*: Authorization of the root element on the target server is not changed. |

### NAVIGATION AND OUTPUT WINDOWS

| Property | Description |
|---|---|
| **Navigation** | Navigation (on page 660) in the configuration steps by means of the **Back** and **Next** buttons.<br>▸ **Back**: One step back.<br>Only available if not the first or last step.<br>▸ **Next**: One step further.<br>Only available if the validation for the current configuration has been completed successfully.<br>This button is replaced:<br>In the **Overview of migration** step by **Start migration**.<br>In the **Migration is taking place** by **New migration**. |
| **Output window** | Display (on page 662) of errors, warnings and notifications. |

## MIGRATE REPORTS AND SUBSCRIPTIONS

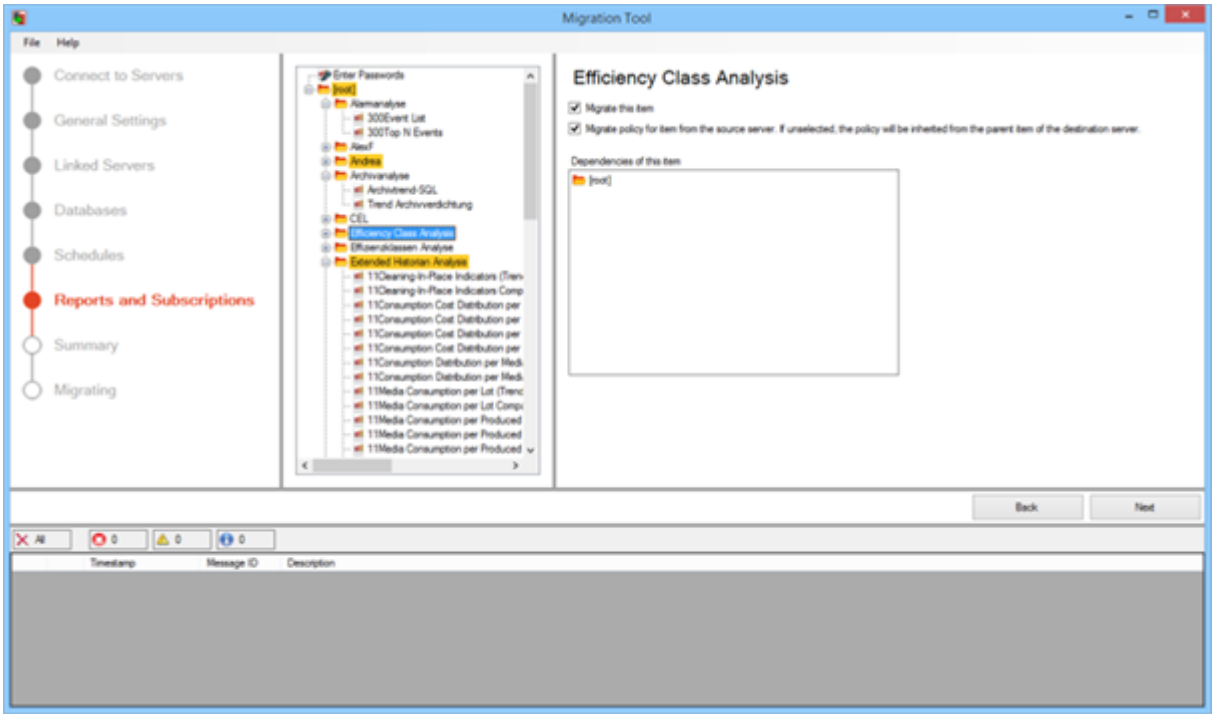
To migrate reports and subscriptions:

1. For each desired object, activate the **Migrate this object** checkbox.

2. Select the configuration for **Migrate policy of the root item from the source server** for folders.

   **Note:** At least one object must be able to be migrated

3. Enter the required passwords in the **Enter passwords** node.

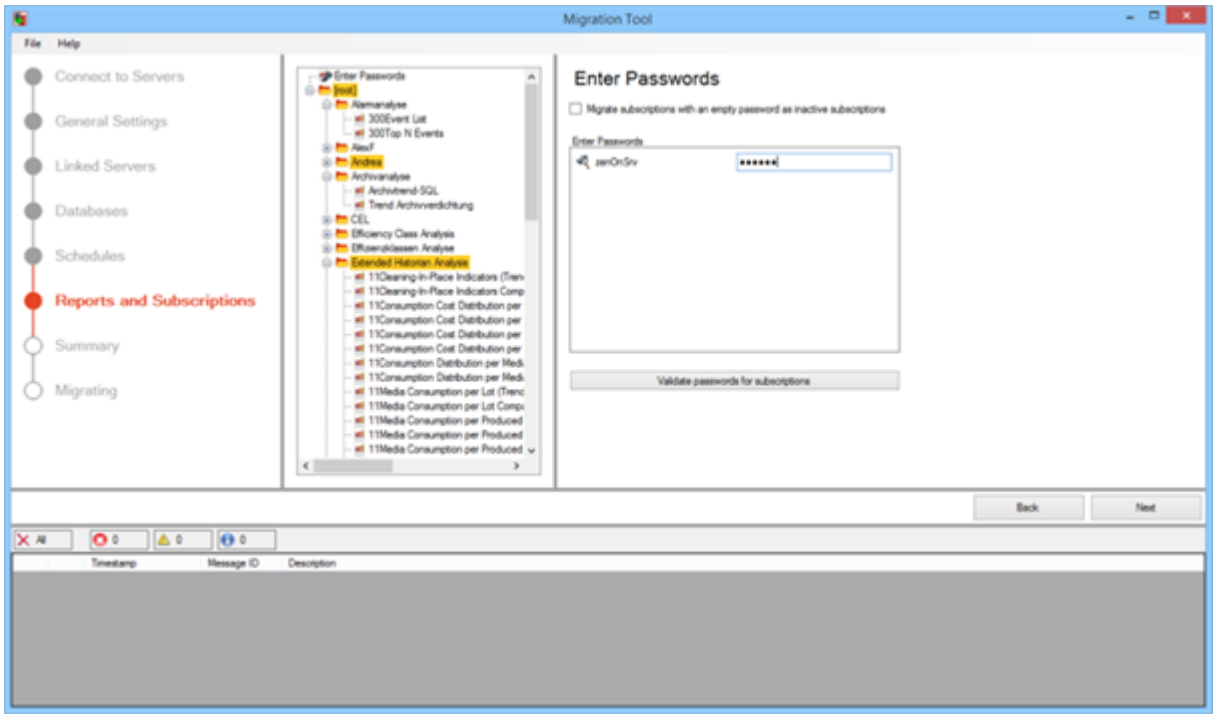



| Option | Description |
|---|---|
| **Step display** | Display of the step to be configured. |
| **Selection tree** | Lists all reports available in Report Launcher.<br><br>In addition, the subscriptions configured for each report are displayed.<br><br>The **Enter password** node allows the input of all passwords required for the provision of passwords. Only present if there are subscriptions. |
| **Title** | Displays the name of the object to be migrated. |
| **Migrate this item** | Configuration of whether the selected object is migrated. Report themes, reports and subscriptions can be migrated.<br><br>▸ *Active*: Object is migrated.<br>▸ *Inactive*: Object is not migrated.<br><br>**Status colors:** |

| Option | Description |
|---|---|
| | ▸ *Yellow*: Object has not been selected for migration or cannot be migrated due to dependencies. |
| **Migrate policy of the root item from the source server.** | Configuration for acceptance of authorizations.<br>▸ *Active*: Authorization of the root element on the source server is transferred to target server.<br>▸ *Inactive*: Authorization is taken on by superordinate element. |
| **Dependencies of this item** | Display of the dependencies for selected report or selected subscription. |

## PASSWORDS

Entry of the passwords required for the migration of subscriptions.




| Option | Description |
|---|---|
| **Enter Passwords** | Options for entry and validation of the passwords. |
| **Migrate subscriptions with an empty password as inactive subscriptions** | Process for a workaround, such as with subscriptions that do not have a password.<br>▸ *Active*: Subscriptions with an empty password field are not |

| Option | Description |
|---|---|
| | migrated but are switched to inactive on the target server.<br>▸ *Inactive*: For each subscription, the required password must be entered correctly and validated. |
| **Enter Passwords** | Entry of the passwords that are needed for subscriptions. For each password, a symbol with the validation result is displayed.<br>**Display of validation result:**<br>▸ Green check mark: Validation successful<br>▸ Magnifying glass: Validation not carried out<br>▸ Red circle: Validation failed |
| **Validate passwords for subscriptions** | Clicking on the button starts the validation process.<br>The results are shown in the list of passwords.<br>**Attention:** If the user of a subscription is also the user who started the migration tool, access, including reading and writing, is also possible with an incorrect password.<br>Background: When creating the access structure, the operating system checks whether the current user context of the process already has access for the given user on the given path if the same user name is contained in the context and in the query. If this is the case, the user context of the process is used and not the user name and the password from the query. |

## 42.7 Summary

All migration steps are displayed as a summary in the **Overview** step. You can check all configured steps here. Only objects activated for migration are displayed. Entries in the root directory are always displayed, even if they do not contain any objects to be migrated.

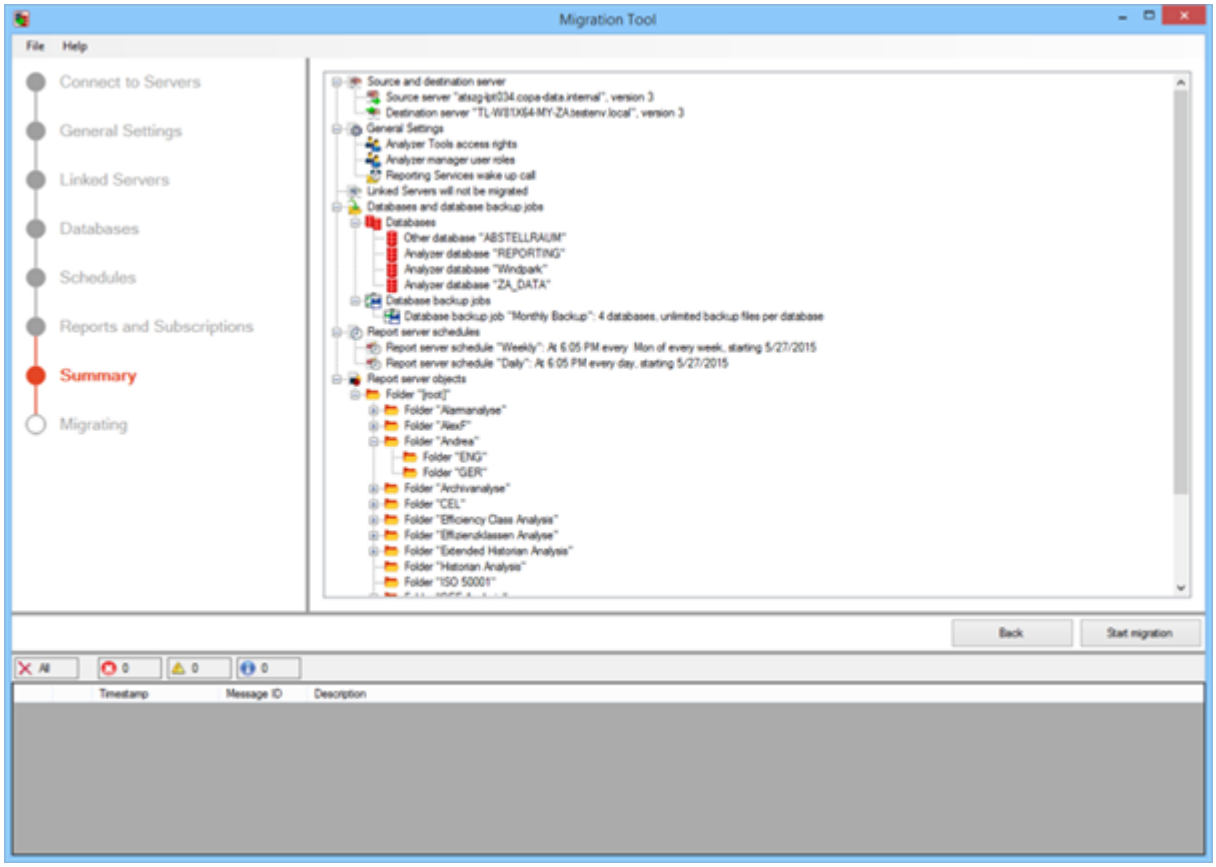
### CHANGE CONFIGURATION

In order to change the configuration, use the **Back** button to go back to the desired step and amend the configuration. Then go back to the overview with the **Next** button.

## START MIGRATION

Click on the **Start Migration** button to start migration.
**Attention:** This process cannot be canceled!

## OVERVIEW DISPLAY




Structure

- **Source and target server**:
  Subnodes: Configured server.
- **General Settings**:
  Subnodes: A node each for general settings to be migrated.
- **Linked Server**
  Subnodes: a node each per Linked Server
- **Databases and database backup jobs**:
  Subnodes: One database each per node and per database backup job.
- **Schedules**:
  Subnodes: A subnode each per schedule.

- **Report Server objects**:
  Subnodes: **Report Server** folder structure, starting with the root element.
  The subscriptions are not shown individually, but the number of subscriptions to be migrated per report is shown if this is greater than *0*.

## 42.8 Migrating

The migration is carried out in this step.

### Attention

The migration tool cannot be operated whilst the migration is carried out:

- The **Options** dialog is blocked. Language switching is not possible.
- All buttons are deactivated.
- The user interface cannot be closed.

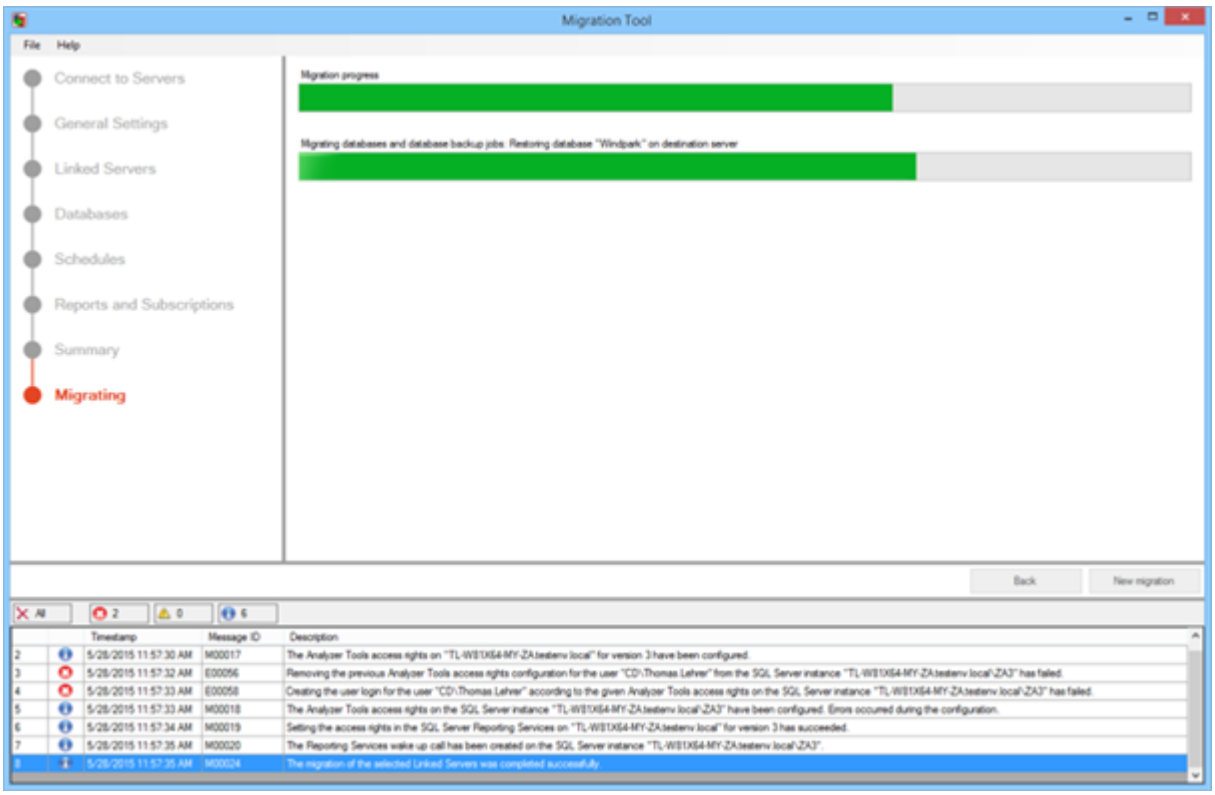
**Attention:** Do not end the process using the Task Manager either. In this case, the target server will remain in an undefined status.

### CARRY OUT MIGRATION

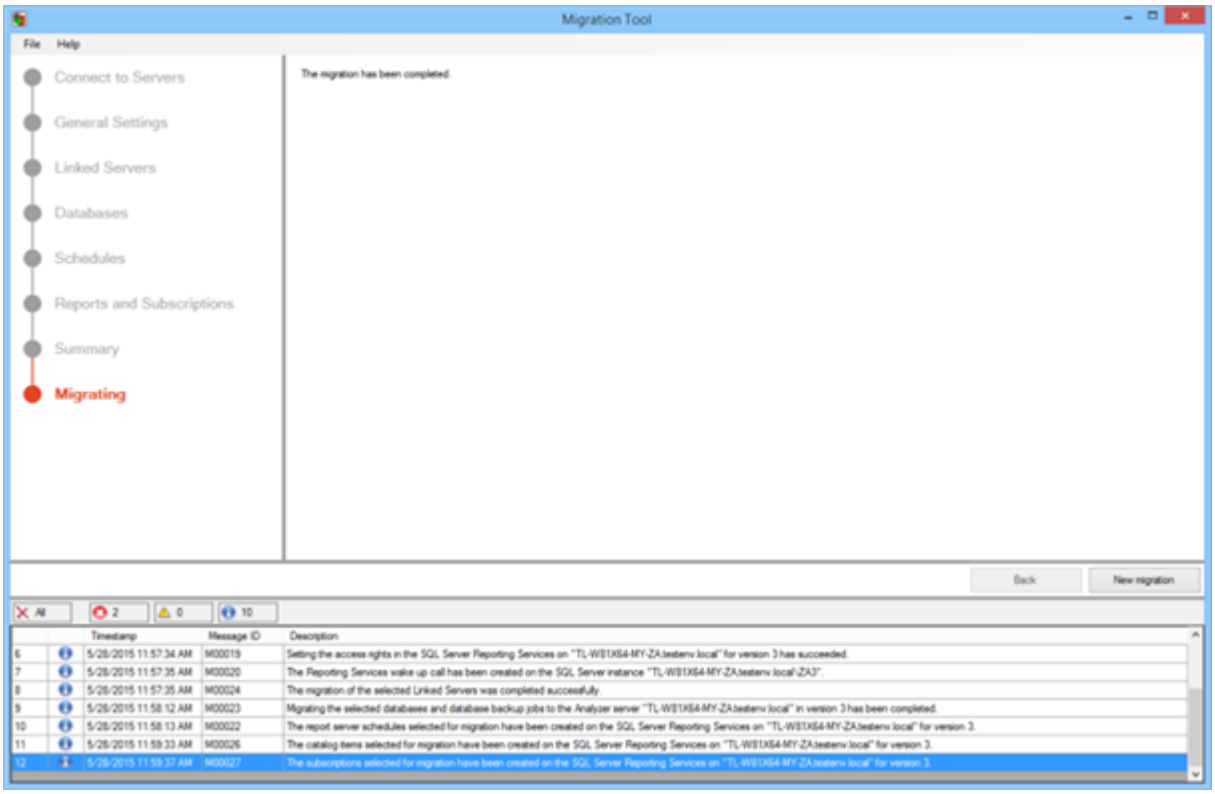
To start the migration:

1. In the **Overview** step, click on the **Start migration** button.

The migration is started. The process is visualized by means of a progress display.




The result is displayed once the migration has been completed.



Details can be found in the output window.

If the process has been canceled by the tool, only the Back button is available.

If the process has been completed successfully, only the New Migration button is available.

2. Close the dialog with **File -> Close** or configure a new migration procedure by clicking on the **New Migration** button.

   If you start the migration again, the connection is separated and the first stage in the migration tool is called up.

## PROGRESS BAR

The progress display consists of two progress bars:

- The upper progress bar shows the overall progress of the migration.
- The lower progress bar shows the progress of the respective partial step.
  The migration consists of 6 partial steps:
  - Connection test
  - Migration of the **general settings**
  - Migration of the **linked servers**
  - Migration of the **databases** and database backup jobs with the following substeps for databases:
    - Create backup on the source server
    - Move backup file from the source server to the target server
    - Restore backup on the target server
  - Migration of the **schedules**
  - Migration of the **reports and subscriptions**