zenon
by COPA-DATA

zenon manual

Metering Point Administration

v.8.10

Contents

1 Welcome to COPA-DATA help

ZENON VIDEO-TUTORIALS

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

GENERAL HELP

If you cannot find any information you require in this help chapter or can think of anything that you would like added, please send an email to documentation@copadata.com.

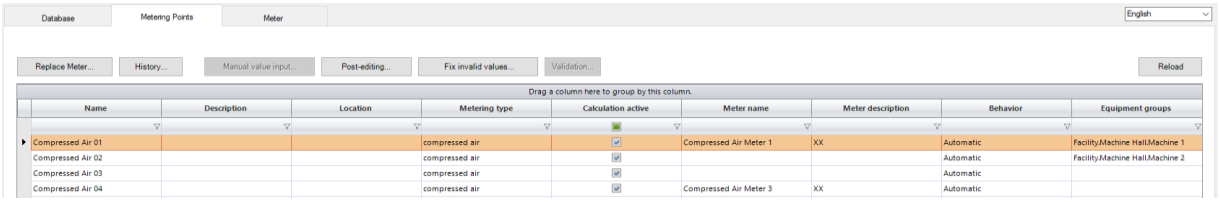
PROJECT SUPPORT

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 Metering Point Administration



The **Metering point administration** is a tool to manage technical data and administer metering points.

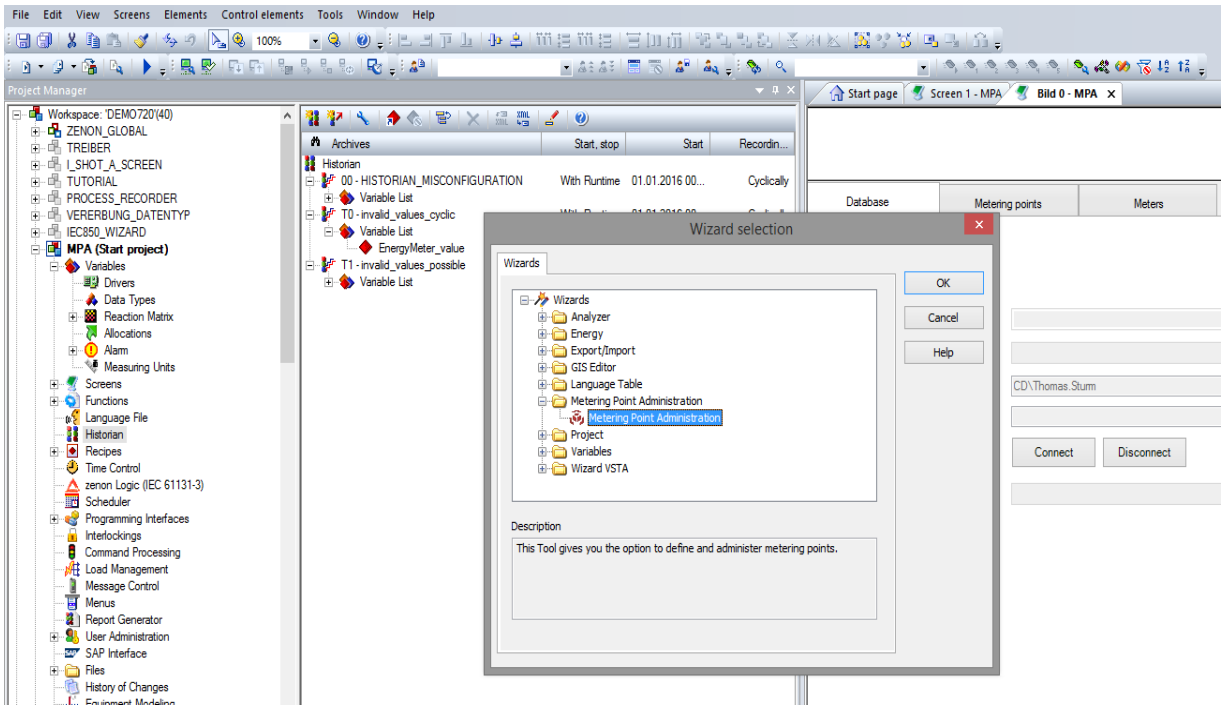
- In zenon Editor, the project configuration is created with the **Metering Point Administration Wizard** (on page 10).

- For display in Runtime, a corresponding ActiveX element (on page 49) is configured in the Editor in any desired zenon screen.
- Meters can be assigned to metering points in Runtime, meters can be replaced and values can be (manually) corrected.
- In addition, there is the possibility to transfer archive entries from existing source archives to a target archive, using a validation process in Runtime.

The wizard is available in the following languages:

- English
- Romanian
- German
- Chinese

3 General - project configuration



To use the metering point administration, the following project configuration steps are necessary:

1. Configure variables in zenon Editor.
   Note: corresponding variables for relative values can also be created in the wizard directly.
2. Configure archives in zenon Editor.
   Note: Archives can also be created directly in the wizard.

3. In zenon Editor, start the **Metering Point Administration** wizard.
4. Create metering points and meters in the wizard.
   Note: Meters can also be created in Runtime.
5. In the wizard, assign the metering points to absolute value variables and relative value variables from archives.
   Note: Relative values can also be calculated automatically.
6. Configure a screen in zenon Editor.
7. Place an ActiveX element (on page 49) in this zenon screen.
8. Assign meters to the corresponding metering points in Runtime.
9. If necessary, enter current values for manual metering points in Runtime for the meters.

4 Install and call up metering point administration

INSTALLING THE WIZARD

The wizard is automatically installed as an add-in during the installation of zenon.
The setting in **zenon6.ini** must be set correctly for add-in wizards to be displayed:

[ADDINS]

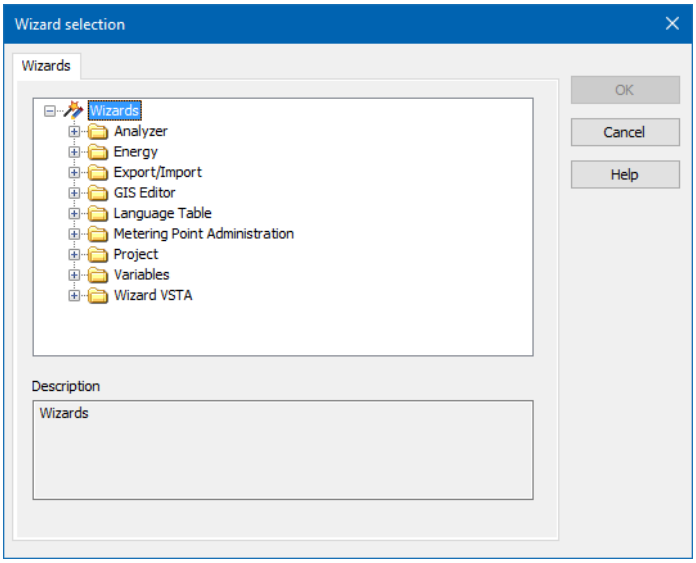
ON=*1*

STARTING THE WIZARD

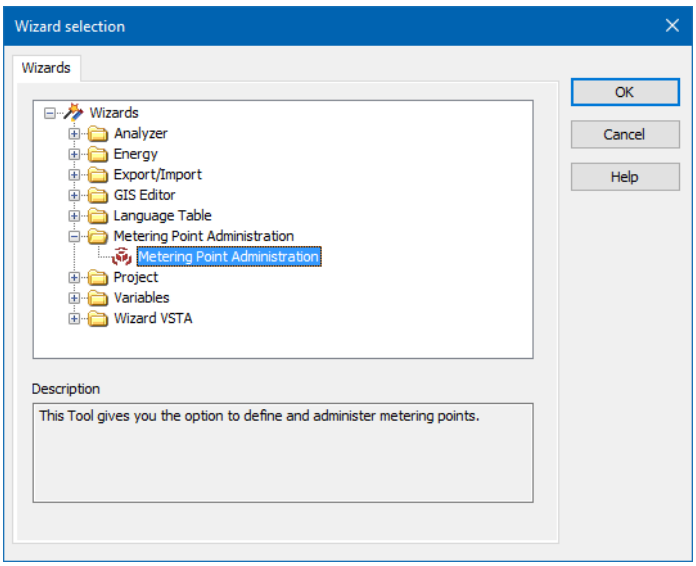
To start the wizard:

1. Click on **Tools -> Start Editor Wizards...**.
   Or: Press the short cut **Alt+F12**

The selection window with the available wizards opens.



2. Select the folder **Metering Point Administration**.
3. There, click on **Metering Point Administration**.

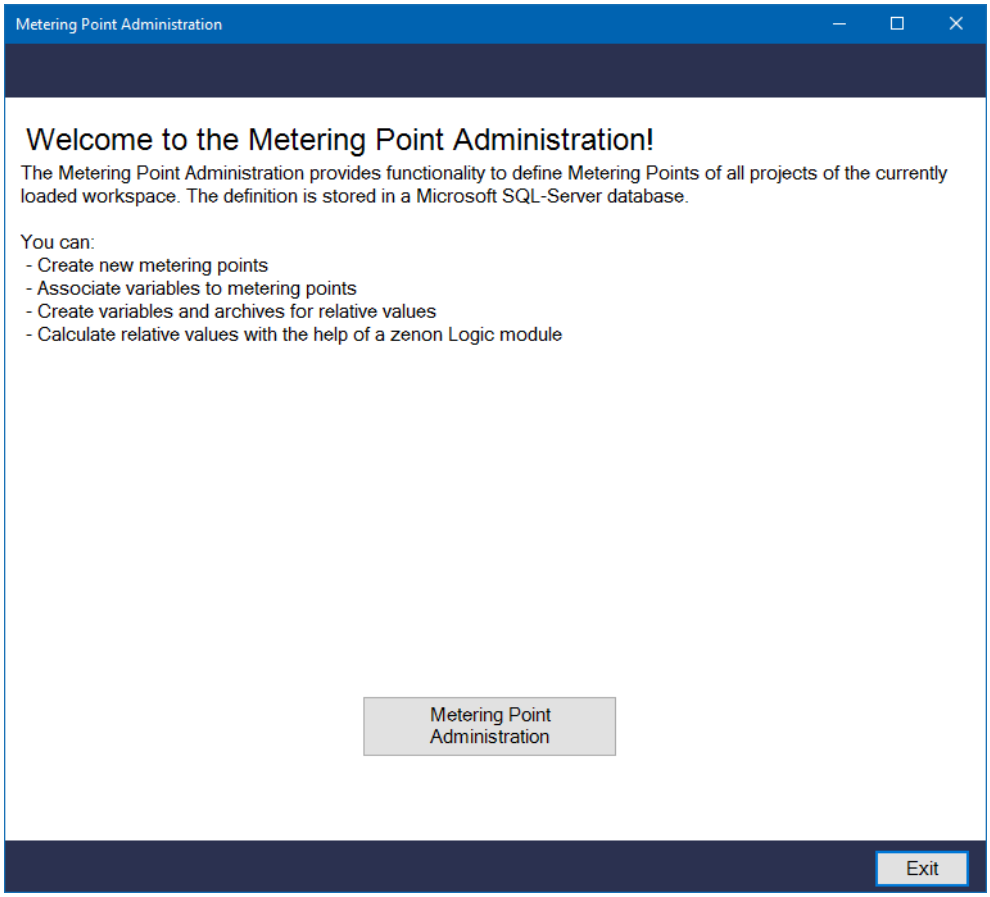


4. Click on **OK**.

5 Wizard - start dialog

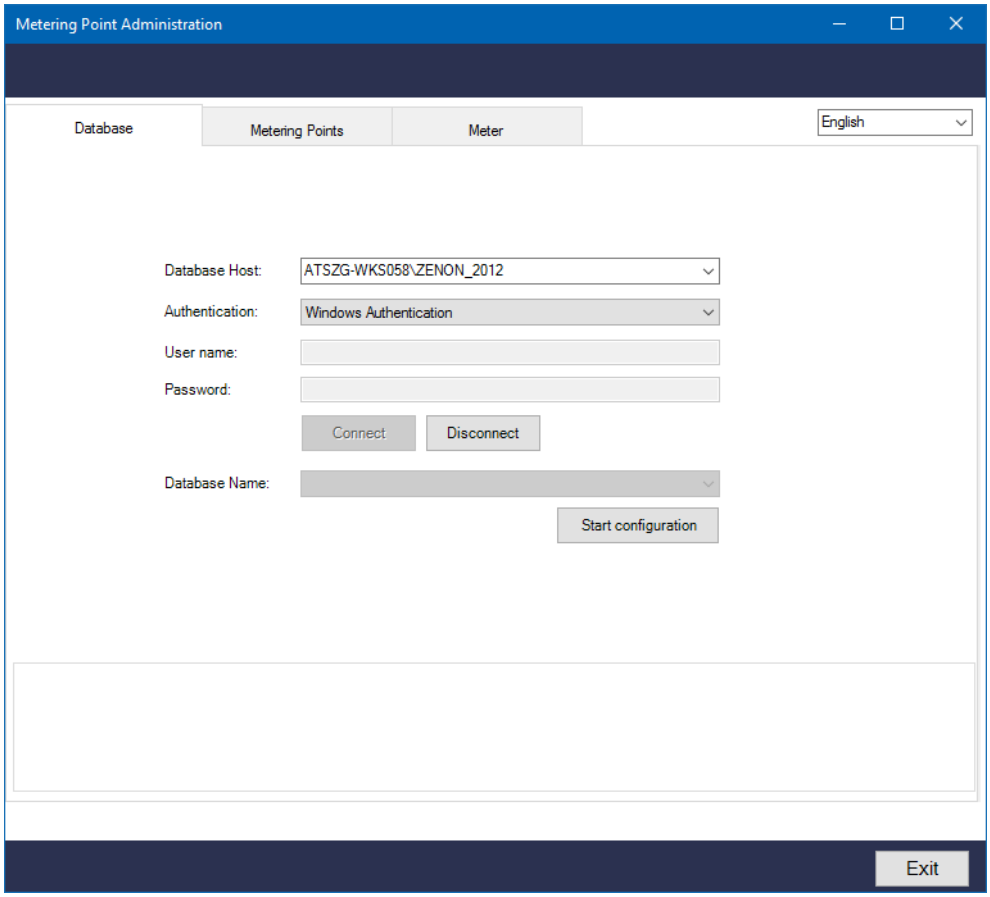
The **Metering Point Administration** wizard starts with the welcome page in English.

When starting the **Metering point Administration** in the zenon Editor, a check is first made to see whether zenon Logic Workbench is open. To avoid incorrect configurations, you are requested to close zenon Logic Workbench if it is open. The wizard cannot be started if Workbench is open!



- To continue, click on the **Metering Point Administration** button.
  The dialog switches to the configuration dialog for metering point administration.
- Clicking on the **Exit** button closes the wizard.

6 Wizard - Metering Point Administration



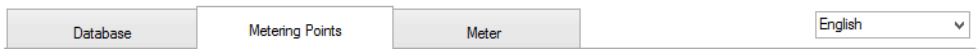
Once the start dialog for the wizard has been confirmed, start the configuration of the metering point administration. Configuration starts with the **Database** tab.

Initially, all activated zenon projects of the workspace and the attendant databases are loaded. This loading process is visualized with a progress bar.

If database settings have already been saved, an attempt to establish a connection is started automatically when the wizard is called up. If this is successful, a switch to the **Measuring points** tab is made. If the establishment of a connection is unsuccessful, a corresponding error message is shown.

Navigation through the tabs is carried out by clicking on the title of the tab.

It is possible to select from *German*, *English* or *Romanian* in the drop-down list for the display language.



Option	Description
Database (on page 12)	Tab for the settings of the necessary database connection.
Metering Points (on page 16)	Tab for the creation and administration of metering points in zenon Editor. Each metering point is assigned corresponding archives and variables.
Counter (on page 43)	Tab for the creation and administration of meters.
Display language	Drop-down list to select the display language for the wizard. ▸ *Deutsch* ▸ *English* ▸ *Română* ▸ *Chinese*

CLOSE DIALOG

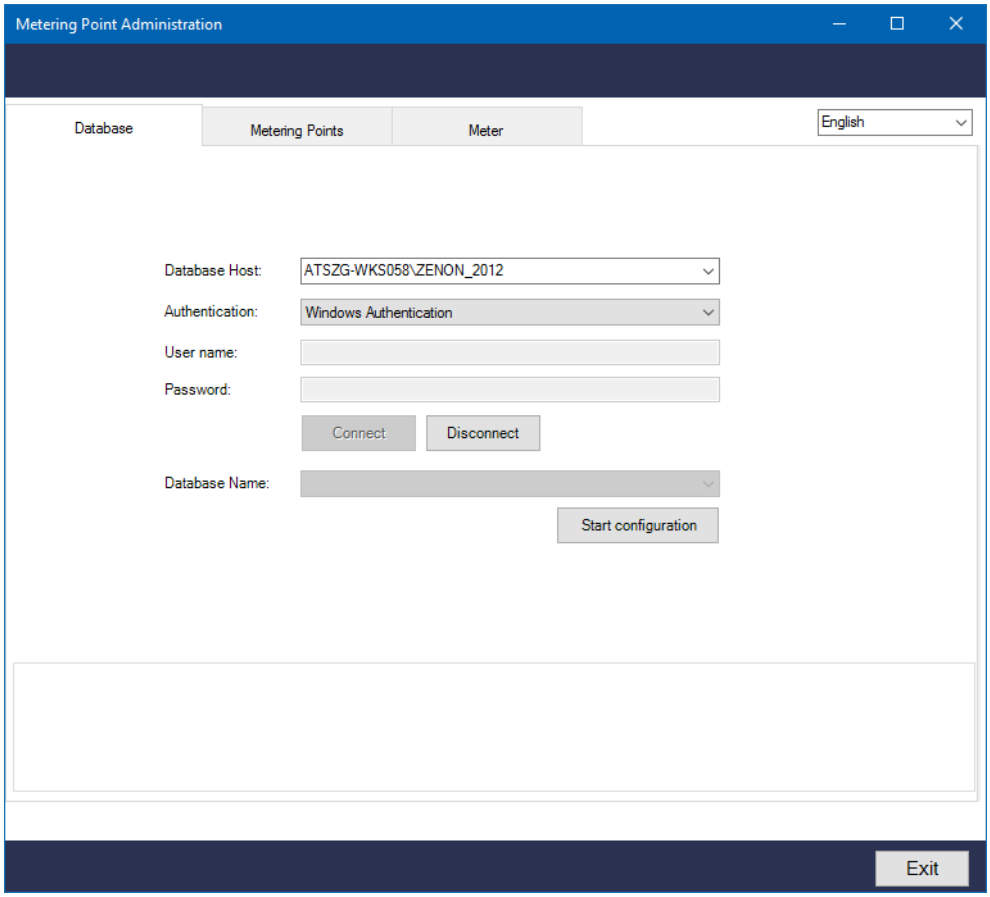
Button	Description
Exit	Closes the wizard. Changes that have not been saved are lost.

Information

Settings changed in the wizard are saved in the user profile of the operating system and loaded at the next opening by the same user.

6.1 Database

You configure the communication settings for a database in this tab.



Parameter	Description
Database Host	Drop-down list for the selection of the database server. Select, for example, your computer in this field. **Note:** Your computer is shown as a default when the tab is opened.
Authentication	Drop-down list for selection of the login method: ▸ **Windows Authentication** (Default): The login to the database is carried out with the information of the user logged in to the local computer. ▸ **SQL Server Authentication**: User name and password are entered manually. The corresponding login data

Parameter	Description
	must be available for database login.
User name	User name for login to a database. Grayed out if the authentication is **Windows Authentication**.
Password	Password for login to a database. For security reasons, each letter is shown with a * when the password is entered. Grayed out if the authentication is **Windows Authentication**.
Connect	Establishes the connection to the configured database server. If no connection is possible (for example due to incorrect entry of user name or password), an error message is called up. Grayed out if it is already connected to a database server.
Disconnect	Disconnects an existing connection to a database server. Grayed out if no connection is active.
Database Name	Drop-down list to select a database. This list shows all available databases of the database server configured under **Database host**. If this list is empty, there is no connection to a database server or there is no SQL database available on the selected computer.
Start configuration	Switches to the **Metering point** tab. If there is not currently a connection to a database, a connection with the login information that has already been entered is established when clicking on the **Start configuration** button. If this input is incorrect or incomplete, no further settings can be changed in the **Metering points** or **Meters** tabs. A connection to a database is always

Parameter	Description
	necessary for this!

CLOSE DIALOG

Button	Description
Exit	Closes the wizard. Changes that have not been saved are lost.

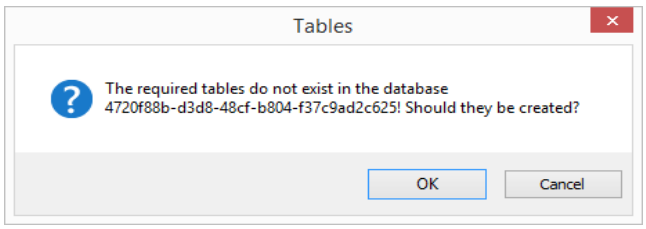
> **Information**
>
> If there is already a connection to a database, all input fields are grayed out.

6.1.1 Database - evaluation and amendment

If a connection to a database is established, the structure of this database is evaluated immediately. Tables required for metering point administration are created automatically if required. The validation is carried out in the Editor and in Runtime.

If amendments to the existing database are required, you are informed of this by means of a dialog. The dialog only appears if amendments are necessary.

EVALUATION DIALOG



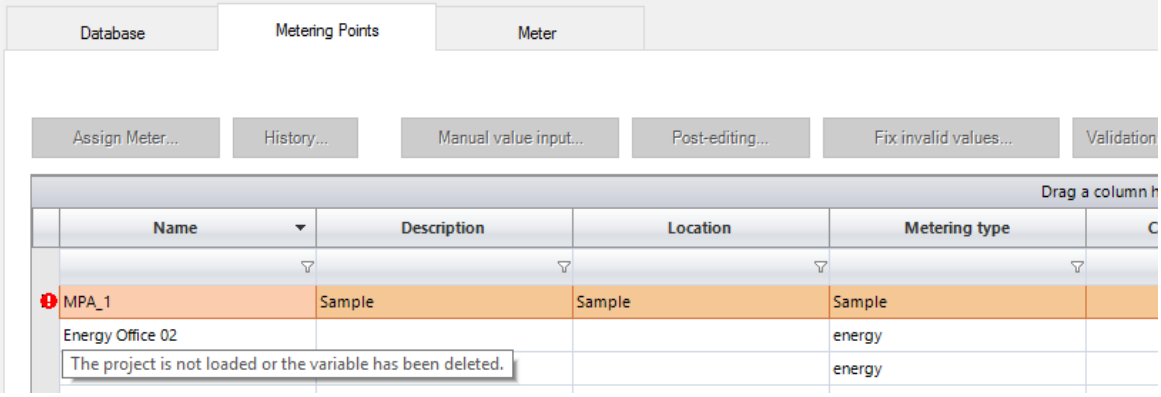
- Confirm this dialog with **Yes** if the database is to be amended to the corresponding tables.
- **Cancel** closes the dialog. No amendments are made in the dialog. Configuration of metering points is not possible. The wizard jumps to the Database tab.

VALIDATION OF THE ARCHIVES

A validation is carried out on starting - errors are visualized.

If a problem occurs when validating the archives, this is signaled by a red warning symbol next to the problematic element. You get a detailed description in the tool tip, if you move to the warning symbol with the mouse.

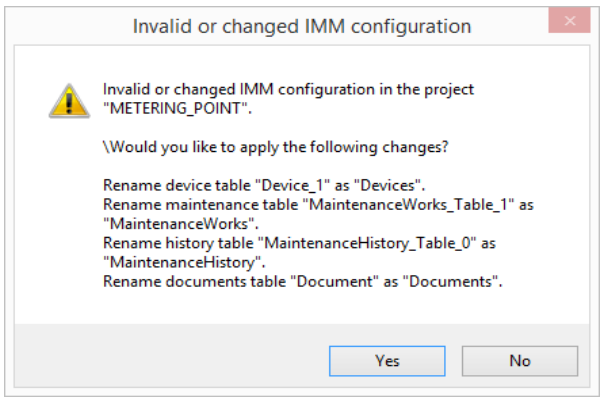
EXAMPLE OF A VIEW - RUNTIME



6.1.2 Industrial Maintenance Manager compatibility

The functionality of the Industrial Maintenance Manager (IMM) can be used for meters in metering point administration. The IMM is used for the administration of machine and maintenance data. Service intervals can be planned and administered with ease. You can see at a glance which devices, items of equipment, machines, etc. have to be maintained today / this week / next month etc. Furthermore, the service work that has been completed in the past is also logged.

When checking the database, the table names of an existing IMM project configuration are checked. If necessary, these names are amended after confirmation.



- Confirm this dialog with **Yes** if the table names are to be amended.
- **No** closes the dialog. No amendments to the table names are made in the database. Configuration of metering points is possible.

IMM TABLE NAMES:

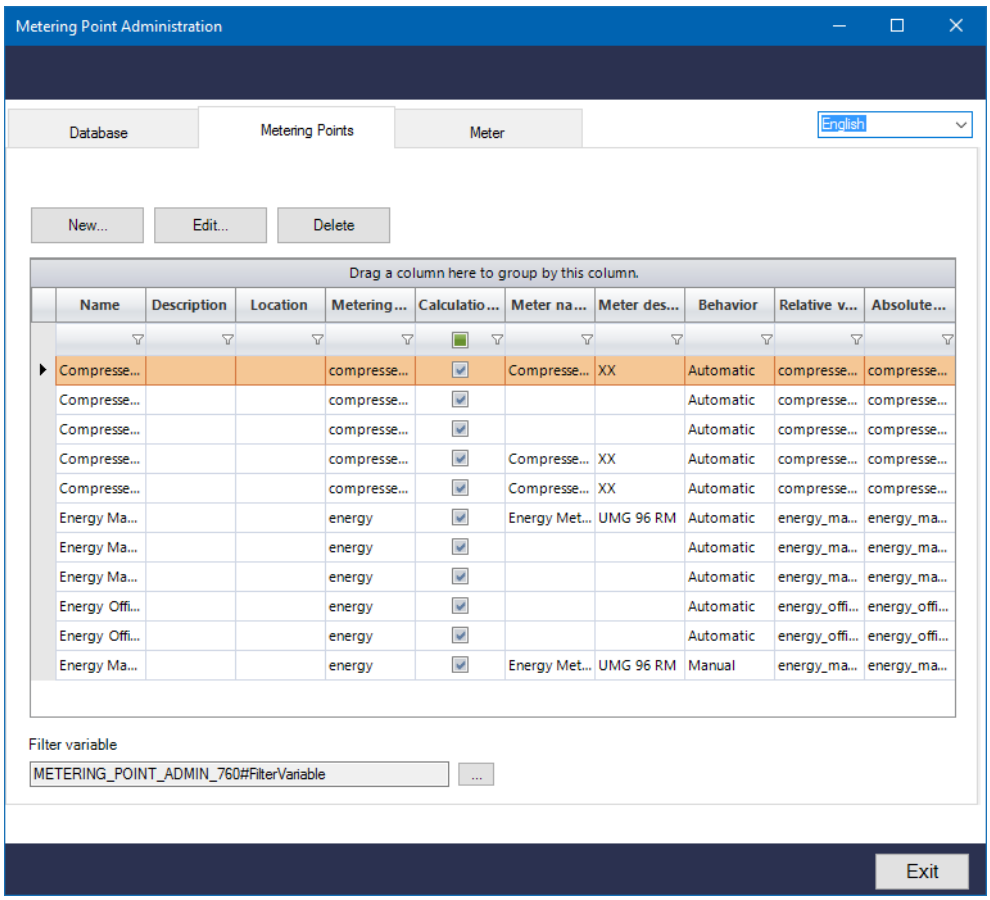
- **Table for devices**: *Devices*
- **Table for maint. works**: *MaintenanceWorks*

- **Table for history**: *MaintenanceHistory*
- **Table for files**: *Documents*

> **Information**
>
> Project configurations from zenon version 7.20 are not affected by this. From version 7.20, the table names for the Industrial Maintenance Manager can no longer be freely configured.

6.2 Metering Points

New metering points are created in this tab and existing ones are administered.



Option	Description
New... (on page 18)	Opens the dialog to create a new Metering Point (on page 18).
Edit... (on page 33)	Opens the dialog to edit the selected metering point (on page 33).

Option	Description
Delete (on page 35)	Deletes the selected Metering Point.
List of metering points	List of the metering points that have been created, as configured in the dialog to create a new metering point (on page 18). Selection by means of clicking. The selected metering point is highlighted in color. Multiple selection is not possible. ▸ *Name* Name of the metering point ▸ *Description* Short description of the metering point ▸ *Location* Location of the metering point ▸ *Automatic* Active, if **Metering Point behavior** is *automatic*. ▸ *Metering point Type* Type of the metering point ▸ *Calculation active* Active if **Calculate relative value** has been *activated*. ▸ *Meter name* ▸ *Meter description* ▸ *Behavior* Metering Point Administration ▸ *Relative value variable* Assigned variable for the relative value. ▸ *Absolute value variable* Assigned variable for the absolute value. You can find out more information in the dialog description (on page 18).
Filter variable [...] (on page 41)	Opens the dialog to select a filter variable (on page 41) that is used in Runtime for the filtering of metering points. In addition to the variable name, the name of the project from which the filter

Option	Description
	variable comes is shown here, separated by **#**.

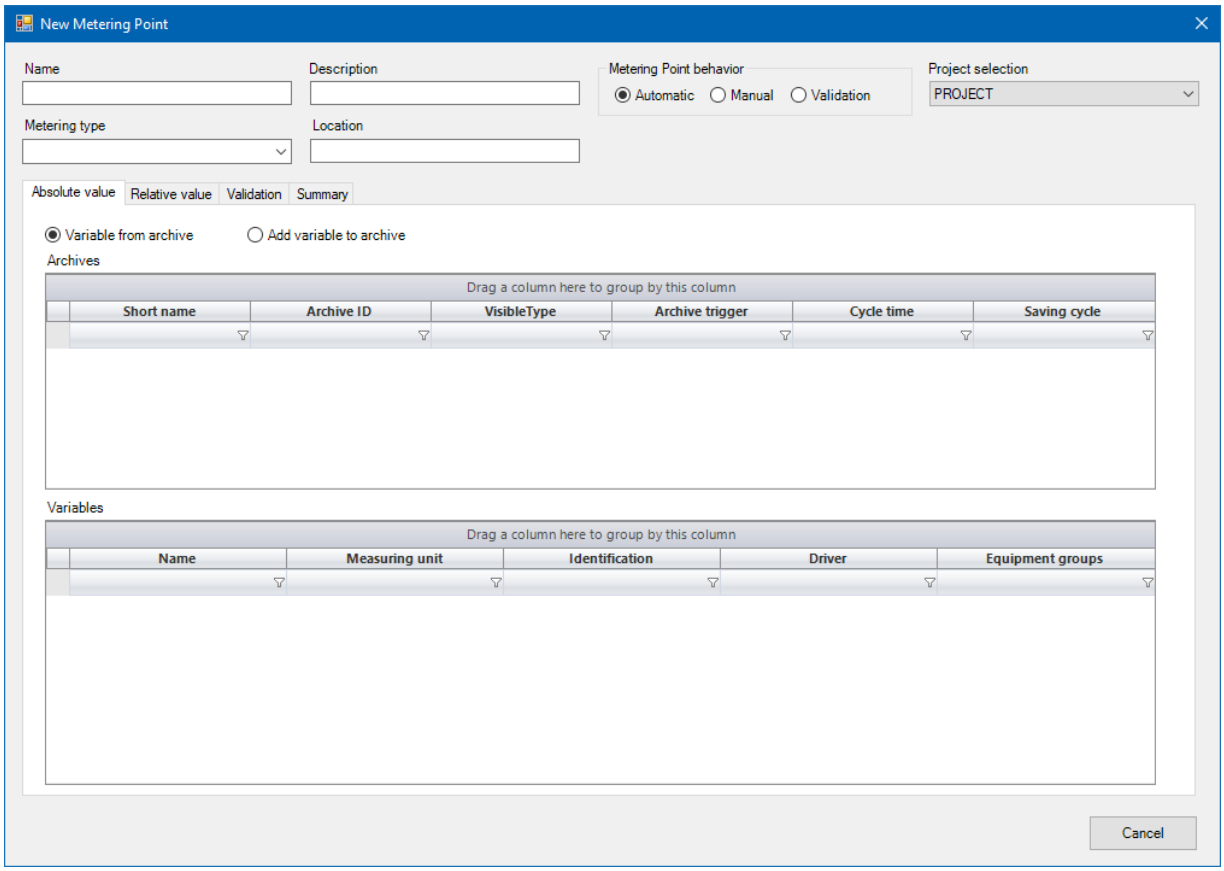
CLOSE DIALOG

Button	Description
Exit	Closes the wizard. Changes that have not been saved are lost.

6.2.1 Create new metering points

Click, in the **Metering points** tab, on **New** to create a new metering point.

The following dialog opens, in which you can configure the new metering point.



Option	Description
Name	Name of the metering point.

Option	Description
	Mandatory field
Description	Description of the metering point. *Optional entry*
Location	Location of the metering point. *Optional entry*
MeteringType	Type assignment of the metering point. *Optional entry* **Note:** A list is kept with all the previously-configured metering point types. These types are displayed when the first applicable letter is typed. If the type that has been entered does not exist in the list, that type is added to the list (auto suggest).
Metering Point behavior	Option field for selection of the value entry ▸ *Automatic*: When this option is activated, both cyclical and spontaneous archives can be selected for the absolute value. The values are taken from the variable. Relative values can be automatically calculated in due course. You can find further information on this behavior in the Relative value (on page 24) tab. ▸ *Manually:* When this option is activated, only spontaneous archives can be selected for the absolute value. The meter values must be read and entered manually. ▸ *Validation:* When activating this option, archive values can be confirmed or modified in Runtime. You can find further information on this behavior in the Validation (on page 28) tab.

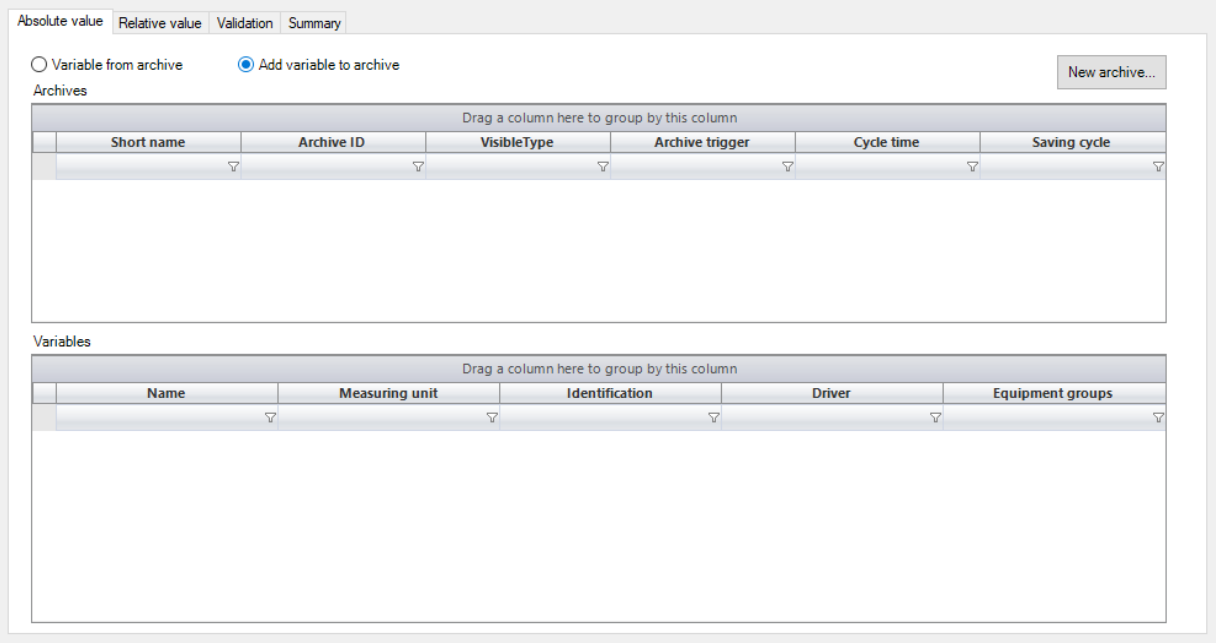
Option	Description
	The following is applicable for *automatic* and *manual* **metering point behavior**: **Note:** The list of the archives and the list of variables for absolute and relative values is filtered according to the metering point behavior. This means that, with manual metering point administration, only spontaneous archives or variables from spontaneous archives are displayed in the list of archives and variables. **Attention:** If you change the metering point behavior of an existing metering point, the absolute value variable and the relative value variable must be reselected.
Project selection	Drop-down list with projects from the current workspace in zenon Editor. **Note:** Archives and variables available are tied to a project. Select the desired project in this field.
Absolute value (on page 21)	Tab for the configuration of the absolute value of the metering point.
Relative value (on page 24)	Tab for the configuration of the relative value of the metering point.
Validation (on page 28)	Tab for the configuration of the validation.
Summary (on page 31)	Checking and conclusion of the configuration of metering point administration.

NAVIGATION

Option	Description
Cancel	Discards all changes in all tabs and closes the dialog.

6.2.1.1 Absolute value

In this tab, an absolute value variable is assigned to the metering point.



Option	Description
Variable from archive	In the list of variables, variables from the selected archive (list of archives) are displayed. Select a corresponding archive and a corresponding variable for the absolute value. **Attention:** The calculation of substitute values must be activated for this archive.
Add variable to archive	Variables from the project are displayed. The selected variable is added to the selected archive. **Attention:** The calculation of substitute values must be activated for this archive.
New archive	Opens dialog for the creation of a new archive (on page 36). Only active if **Add variable to archive** is active.

Option	Description

Information

The options in this tab are not available if the **metering point behavior** is *validation*.

ARCHIVES (LIST)

Here, you select an archive from which you want to have variables displayed or to which you want to add a selected variable.

Note: Existing project configurations of archives are displayed in the list. In addition, it is possible to create a new archive directly in the wizard by clicking on the **New archive** (on page 36) button.

Option	Description
Short name	Archive reference.
Archive ID	Archive name
Type	Archive type ▸ *Cyclic* Archive is cyclical. Values are saved in configured time intervals. ▸ *EventTriggered* Archive is event-triggered. **Note:** Event-triggered archives can only be used for automatic metering points. Direct configuration of event-triggered archives in the metering point administration is not possible. ▸ *Value Change* Archive is spontaneous. Each change to a value is immediately written to the variable in the archive. Hysteresis can be configured.
Archive trigger	Trigger in order to write values to an archive. **Note:** Only available with event-triggered archives.
Cycle time	Time interval in which values are written to the archive with cyclical scanning.

Option	Description
	Format: ▸ *n.A.* If archive type is *Value Change* or *EventTriggered*. ▸ *DD:HH:MM:SS* ▸ *Month* With monthly cycle
Saving cycle	Time interval between the creation of new archive files. Format: ▸ *DD:HH:MM:SS* ▸ *Month* With monthly save cycle. ▸ *Year* With *annual change* save cycle.

VARIABLES (LIST)

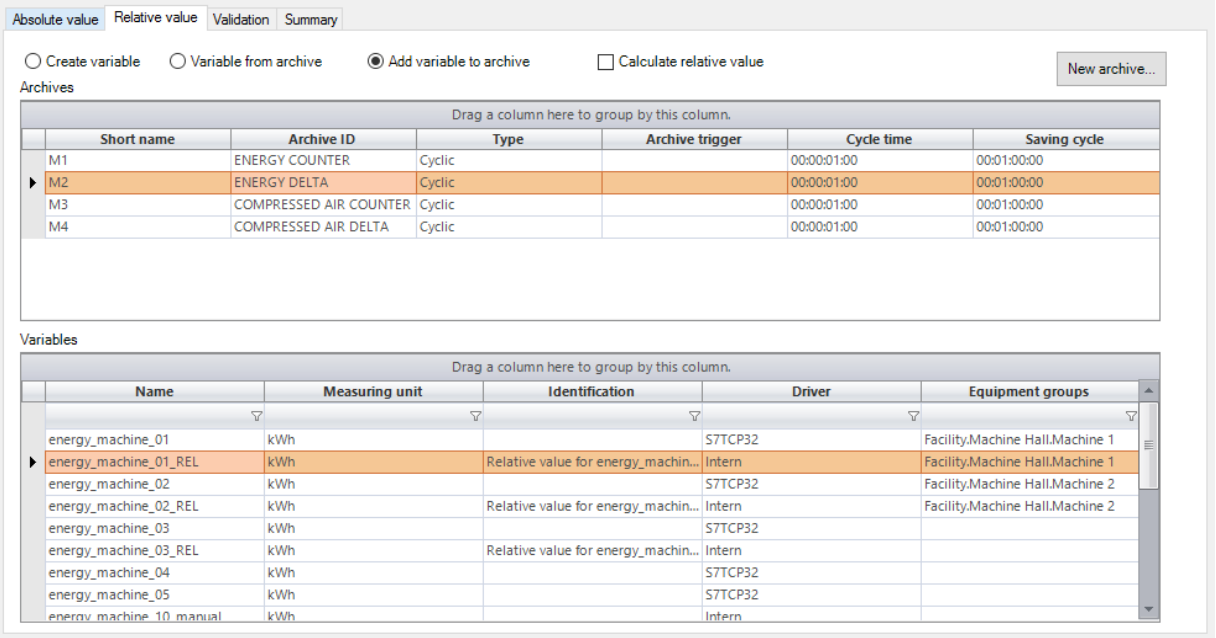
Option	Description
Name	Variable name.
Measuring unit	Measuring unit of the variables.
Identification	Identification of the variable.
Drivers	Driver of the variable.
Equipment groups	Equipment group that is assigned to the variable. **Note**: A variable can also be assigned to several equipment groups.

NAVIGATION

Option	Description
Cancel	Discards all changes in all tabs and closes the dialog.

6.2.1.2 Relative value

In this tab, a relative value variable is assigned to the metering point.



Option	Description
Create variable	A new variable is created for the relative value. Type: *LREAL*, driver: *INTERN*.
Name	Name of the new variable to be created. A valid name, based on the selected absolute value variable, is proposed. The name must be unique and can be given as desired. No special characters are permitted. A maximum of 256 characters can be entered. The entry is validated. The result of the validation (success or error) is shown next to the input field by means of a symbol. **Note:** Only visible if **Create variable** has been selected. A variable must be selected in the Absolute value tab, so that a proposed name is shown here.
Variable from archive	Shows list of archives and list of variables belonging to the selected archive:

Option	Description
	Attention: The calculation of substitute values must be activated for this archive.
Add variable to archive	Variables from the project are displayed. The selected variable is added to the selected archive. **Attention:** The calculation of substitute values must be activated for this archive.
Calculate relative value	Checkbox to activate the automatic calculation of relative values: Selection is optional with automatic metering points. Selection is automatically activated with manual metering points. This automatic preselection cannot be deactivated. **Note:** You can get further information on the automatic calculation of relative values in the zenon Logic (on page 83) chapter.
New archive	Opens dialog for the creation of a new archive (on page 36). Not active if **Variable from archive** is active.
Archives	Archives that were previously created in zenon Editor or with the **New archive** button are ready for selection in list form. Only cyclical archives are displayed.

Information

The options in this tab are not available if the **metering point behavior** is *validation*.

ARCHIVES (LIST)

Here, you select an archive from which you want to have variables displayed or to which you want to add a selected variable.

Note: Existing project configurations of archives are displayed in the list. In addition, it is possible to create a new archive directly in the wizard by clicking on the **New archive** (on page 36) button.

Option	Description
Short name	Archive reference.
Archive ID	Archive name
Type	Archive type ▸ *Cyclic* Archive is cyclical. Values are saved in configured time intervals. ▸ *EventTriggered* Archive is event-triggered. **Note:** Event-triggered archives can only be used for automatic metering points. Direct configuration of event-triggered archives in the metering point administration is not possible. ▸ *Value Change* Archive is spontaneous. Each change to a value is immediately written to the variable in the archive. Hysteresis can be configured.
Archive trigger	Trigger in order to write values to an archive. **Note:** Only available with event-triggered archives.
Cycle time	Time interval in which values are written to the archive with cyclical scanning. Format: ▸ *n.A.* If archive type is *Value Change* or *EventTriggered*. ▸ *DD:HH:MM:SS* ▸ *Month* With monthly cycle
Saving cycle	Time interval between the creation of new archive files. Format:

Option	Description
	▸ *DD:HH:MM:SS* ▸ *Month* With monthly save cycle. ▸ *Year* With *annual change* save cycle.

VARIABLES (LIST)

Option	Description
Name	Variable name.
Measuring unit	Measuring unit of the variables.
Identification	Identification of the variable.
Drivers	Driver of the variable.
Equipment groups	Equipment group that is assigned to the variable. **Note**: A variable can also be assigned to several equipment groups.

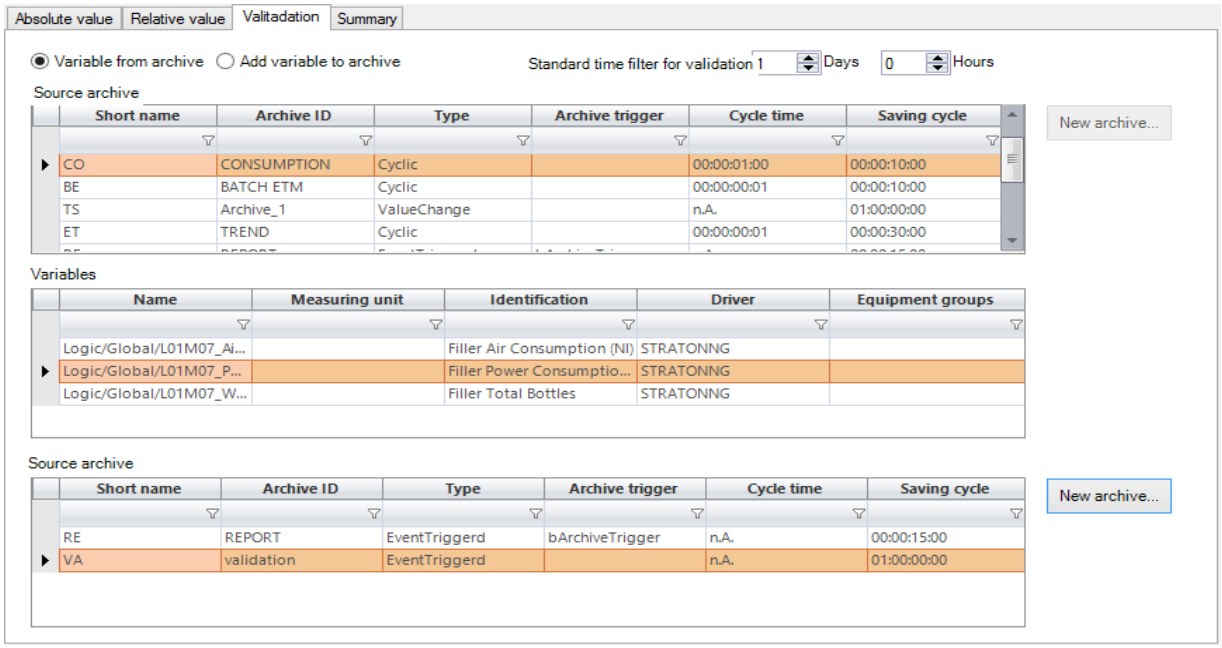
> **Information**
>
> The list of variables is hidden if **Create variable** is active.

NAVIGATION

Option	Description
Cancel	Discards all changes in all tabs and closes the dialog.

6.2.1.3 Validation

Variables from archives are configured for a validated metering point in the **Validation** tab.



The options of this tab are only available if, in the **metering point behavior** property, the *Validation* option has been selected.

Option	Description
Variable from archive	In the list of variables, variables from the selected source archive (list of archives) are displayed. Select a corresponding archive and a corresponding variable for the measured value.
Add variable to archive	Variables from the project are displayed. The selected variable is added to the selected archive.
Source archive	List of the configured archives. Selection of the archive with the click of a mouse. After selection, the variables contained therein are displayed in the variable list.
New archive...	Opens the dialog for the creation of a new source archive (on page 36). Not active if **Variable from archive** is active.
Variables	List of variables: ▸ **Variable from archive**:

Option	Description
	Variables from the selected source archive ▸ **Add variable to archive**: Variable list of the loaded project.
Source archive	List of all configured *EventTriggered* archives.
New archive...	Opens the dialog for the creation of a new target archive (on page 36). **Note:** Target archives have only *EventTriggered* archives by default.

STANDARD TIME FILTER FOR VALIDATION

Input field for selection of the validation time range. The time range set here is used in the Runtime during validation as a time filter for the archive entries to be displayed.

The time range comprises days and hours.
Click on the desired range to highlight this for the change. Change the area with an entry or by clicking on the arrow keys.

The following is applicable for entry:

- Only whole numbers are taken into account.
- Value entries with a comma are rounded up.
- An hour entry >23 is corrected to 23.
- A day entry > 1000 is corrected to 1000.
- Negative inputs receive the value 0.

Option	Description
Days	Time range of validation in days. Default:*1*
Hours	Time range of validation in hours. Default:*0*

ARCHIVES (LIST)

Here, you select an archive from which you want to have variables displayed or to which you want to add a selected variable.

Note: Existing project configurations of archives are displayed in the list. In addition, it is possible to create a new archive directly in the wizard by clicking on the **New archive** (on page 36) button.

Option	Description
Short name	Archive reference.
Archive ID	Archive name
Type	Archive type ▸ *Cyclic* Archive is cyclical. Values are saved in configured time intervals. ▸ *EventTriggered* Archive is event-triggered. **Note:** Event-triggered archives can only be used for automatic metering points. Direct configuration of event-triggered archives in the metering point administration is not possible. ▸ *Value Change* Archive is spontaneous. Each change to a value is immediately written to the variable in the archive. Hysteresis can be configured.
Archive trigger	Trigger in order to write values to an archive. **Note:** Only available with event-triggered archives.
Cycle time	Time interval in which values are written to the archive with cyclical scanning. Format: ▸ *n.A.* If archive type is *Value Change* or *EventTriggered*. ▸ *DD:HH:MM:SS* ▸ *Month* With monthly cycle
Saving cycle	Time interval between the creation of new archive files. Format:

Option	Description
	▸ *DD:HH:MM:SS* ▸ *Month* With monthly save cycle. ▸ *Year* With *annual change* save cycle.

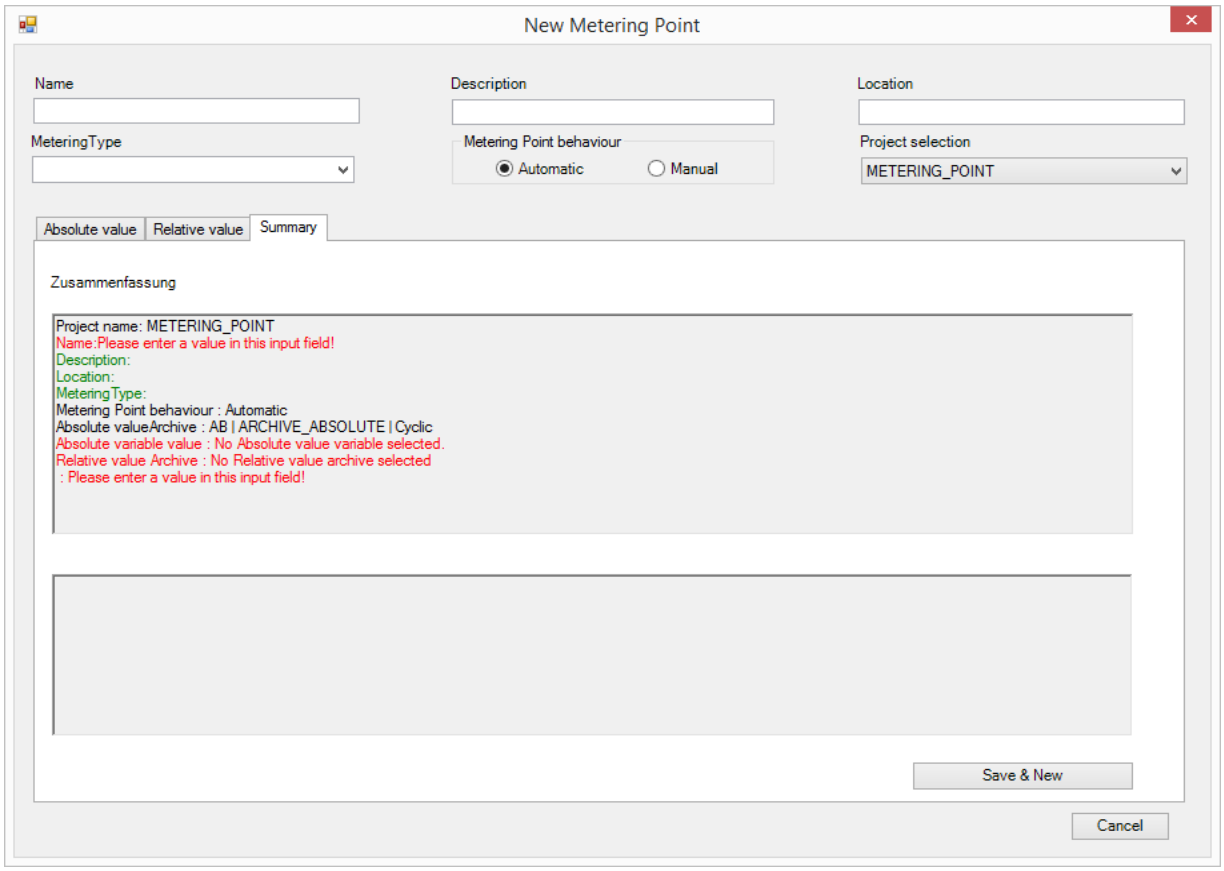
VARIABLES (LIST)

Option	Description
Name	Variable name.
Measuring unit	Measuring unit of the variables.
Identification	Identification of the variable.
Drivers	Driver of the variable.
Equipment groups	Equipment group that is assigned to the variable. **Note**: A variable can also be assigned to several equipment groups.

6.2.1.4 Summary

The configurations of a metering point are evaluated and concluded in this tab.

The result is shown in the summary window in two fields.



SUMMARY

Option	Description
Field for project configuration information	The upper field contains a summary of the configuration of the metering point. The text information is distinguished by being displayed in different colors.
Black text color	Settings are correct. These are created and applied by clicking on **Save & New**.
Red text color	Errors in the configured settings must be checked once again and improved. No saving is possible in this case.
Green text color	New settings are created and applied. Saving is now possible.

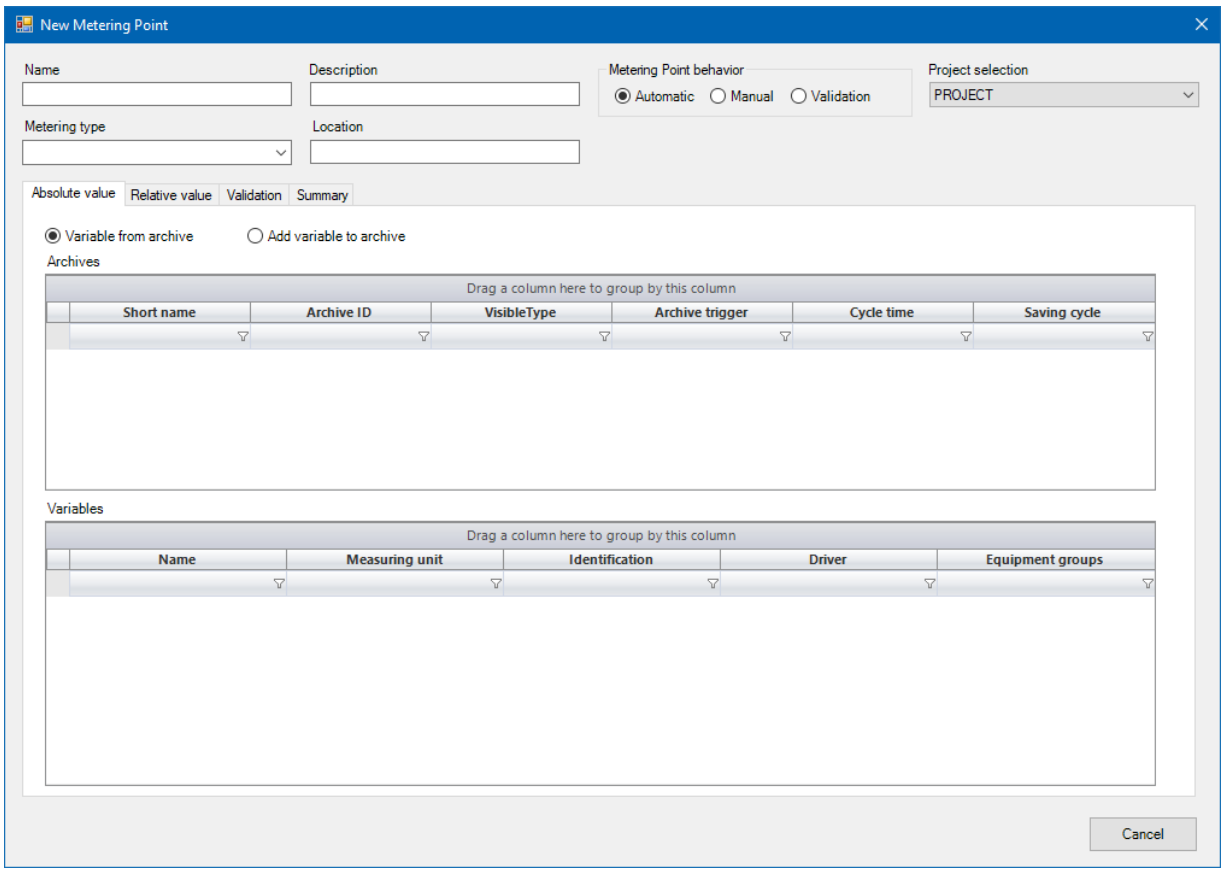
Option	Description
Blue text color	Amended project configurations are shown in blue text.
Orange text color	Warning messages. Project configurations that are not recommended are shown in orange.
Field for additional information	General information about the steps carried out is shown in this field if available. The color coding of the texts is the same as in the field for project configuration information. However in this text field, only successful (green text) and faulty steps (red text) are shown.
Save & New	Accepts settings and creates the new metering point. All values are reset and it is possible to continue with the configuration of other metering points. If the project configuration in incorrect, corresponding project information is shown in the field for project configuration information.
Cancel	Discards all changes in all tabs and closes the dialog.

6.2.2 Edit metering points

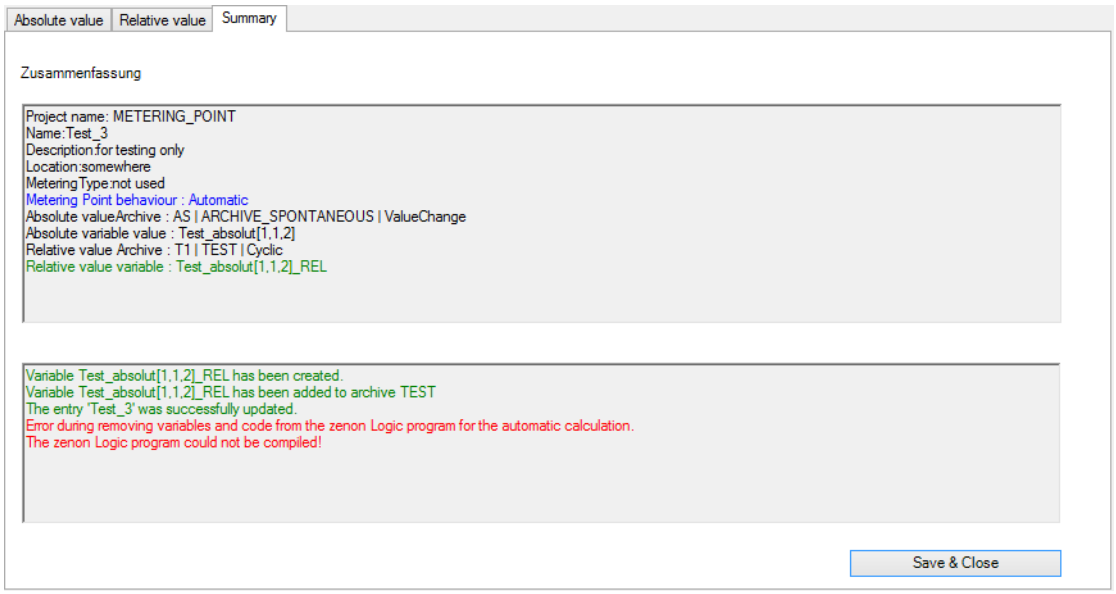
To edit an existing metering point, proceed as follows:

1. Select a metering point that you want to edit in the **Meter** tab.
   The selected metering point is accented in color.
2. Then click on the **Edit** button or double click on the desired metering point.
   The existing project configuration is shown in the dialog **Edit Metering Point**.

3. Add additional information, administer the metering point as you wish and click in the **Summary** tab on **Save & Close**.



SUMMARY:



Amended settings are shown in the summary in *blue*.

- Clicking on **Save & Close** saves the amended settings.

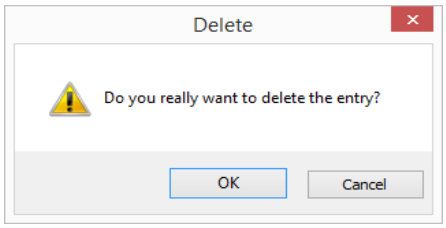
> **Attention**
>
> Ensure that the project is loaded when editing a metering point. Editing without a project destroys the metering point.

6.2.3 Delete Metering Point

To delete an existing metering point, proceed as follows:

1. Select a metering point that you want to delete in the **Meter** tab.
2. Then click on the **Delete** button.
3. A warning dialog appears.
4. Confirm the deletion by clicking on the **OK** button.
5. The selected metering point is deleted.

WARNING DIALOG



Option	Description
OK	Selected metering point is deleted.
Cancel	Cancels deletion process. Warning dialog is closed without an action.

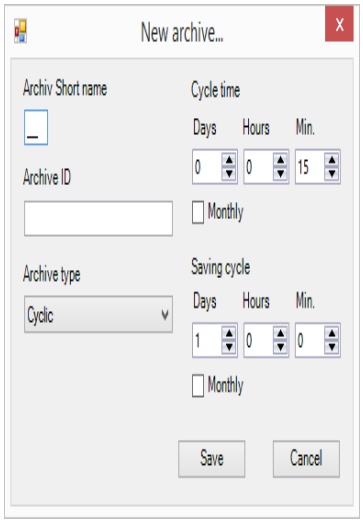
> **Information**
>
> If an automatic metering point with automatic relative value calculation is deleted, the attendant project configurations (variables and code lines) are removed in zenon Logic.

6.2.4 New archive

The "**New archive**" button is visible:

- If, in the **Absolute value** tab of the wizard, the **Add variable to archive** button is active.
- If, in the **Relative value** tab of the wizard, the **Create variable** or **Add variable to archive** buttons are active.

If the **Add variable to archive** button is active in the **Validation** tab.
The button is always active during validation of target archives. These archives have *event triggered* as the archive type by default.



Option	Description
Archiv Short name	Short name for the archive to be created. Maximum 2 characters, 0-9 or A-Z, must be unique. **Attention:** You cannot change the identification afterwards.
Archive ID	Name of the archive. Default: *empty*
Archive type	Type of recording: ▸ *Cyclic* The data is written to the archive in the set interval (default). ▸ *ValueChange* Record on change

Option	Description
	▸ *Event triggered* Is only available for target archives of the validation.
Cycle time	Define the cycle (days, hours, minutes and seconds) in which values for cyclical archives are to be read. Default: *15 minutes* (for cyclical archives)
Monthly	If active: The values are read in each time the month changes (monthly archive). Default: *inactive*.
Saving cycle	Define the cycle time (days, hours and minutes) in which new archive files are to be created. Default: *1 day* **Note:** grayed out if cycle time is monthly
Monthly	If active: The archive file is saved each time the month changes Default: *inactive*.

CLOSE DIALOG

Option	Description
Save	Applies settings and closes the dialog.
Cancel	Discards all changes and closes the dialog.

Information

You can get further information about archives in the Historian manual, in the Edit archives chapter.

6.2.4.1 Background information

When creating new archives for absolute value and relative value variables in metering point administration, the duration of storage for archive files is set to the maximum possible value.

This is necessary because manual editing via the metering point administration is not possible for non-evacuated archive files (in *.ARX format). This does not include data that has been evacuated to SQL; subsequent manual editing of this is always possible.

Attention

Evacuated archive files in .ARX internal database format cannot be edited. You should therefore always select SQL database for evacuated archives.
Note: You configure the evacuation in the **Edit archive** dialog in the **Save**.tab

RECOMMENDATION

To keep the number of files to be stored within limits, it is recommended that you configure a sufficiently large save cycle.

Hint

Always configure your save cycle >= 1 day.
You can get further information in the Historian manual, in the Edit archive, Save chapter.

OFFSET AND WAITING TIME

To ensure correct archiving of the relative value, the metering point administration module carries out automatic project configurations.

The following settings are set automatically:

- Offset: 5 seconds (only for relative value archives)
  You can find further information in the Historian manual, in the Edit archive, Recording type chapter.
- VACO waiting time: 10 seconds
  If an automatic measuring point calculation is activated for relative value, the waiting time of the VACO (on page 85) must be set to 10 seconds and the offset for new relative value archives to 5 seconds.
  For existing relative value archives, the offset must be checked manually and amended accordingly.
  You can find more information in the VACO function block chapter.

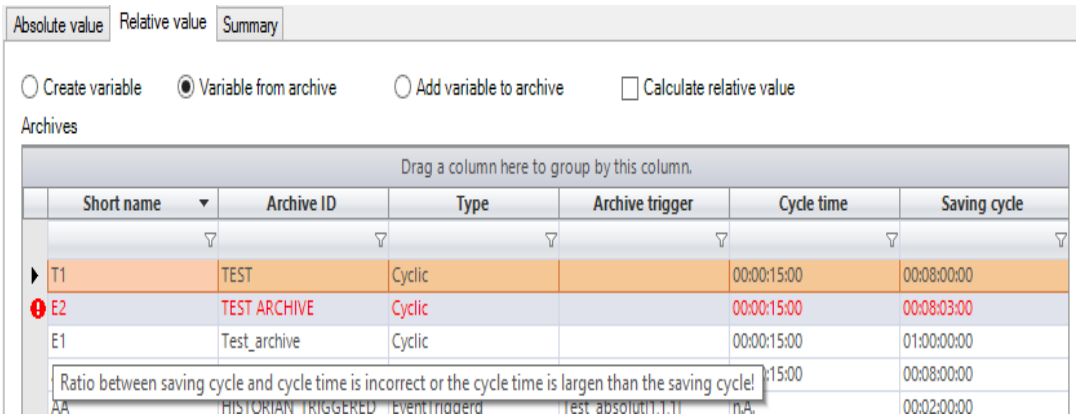
INFORMATION DURING PROJECT CONFIGURATION

The corresponding information is shown during project configuration in the **Summary** (on page 31) tab for the Metering Points (on page 16):

- Archive for absolute values should have offset 0 (corresponding warning message)
- Relative value archive must have offset 5 (information, amendment is automatic)
- Both archives should be different (corresponding waning message)

6.2.4.2 Visualization of incorrect project configurations

If a problem occurs when configuring a project, this is signaled by a red warning symbol next to the problematic element. You get a detailed description in the tool tip, if you move to the warning symbol with the mouse.



6.2.4.3 Checking the archives

Archives used in the **Metering Point Administration** module are evaluated during project configuration.

The archive configuration is checked as follows:

- After the wizard has started, in the list of metering points.
  A cause for the incorrect project configuration could be editing the archive in zenon Editor directly.
- When creating/editing metering points.
- When creating a new archive using metering point administration.
  Validation is triggered by clicking on the **Save** button.

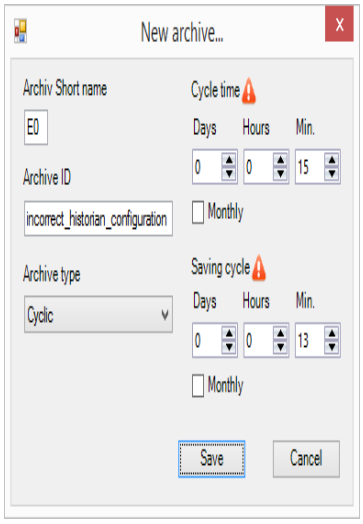
CONFIGURATION CRITERIA FOR RELATIVE VALUE ARCHIVES

Certain configuration criteria are applicable for automatic metering points for relative value archives. These criteria result due to the logic of the relative value calculation.
Archives created with the wizard always correspond to these criteria.

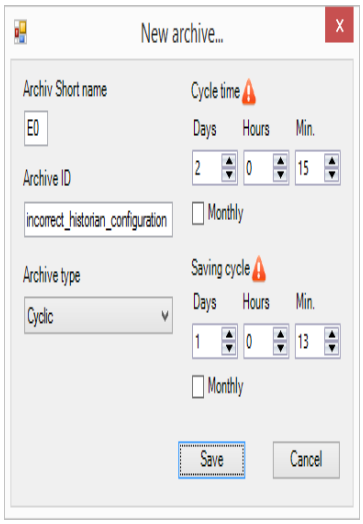
- The cycle time must not be greater than the save cycle.
- The save cycle must be an integral multiple of the cycle time.
- If monthly change is selected as a cycle time, the save cycle must be a monthly change or yearly change.
- If monthly change is selected as a save cycle, the cycle time must be a maximum of 1 day.

6.2.4.3.1Examples

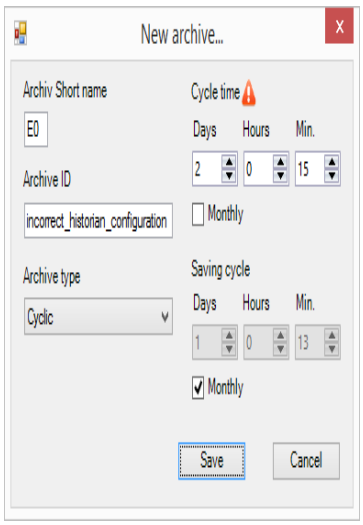
CYCLE TIME GREATER THAN SAVE CYCLE



SAVE CYCLE NOT A WHOLE-NUMBER MULTIPLE OF THE CYCLE TIME



INCORRECT CYCLE TIME FOR MONTHLY SAVE CYCLE

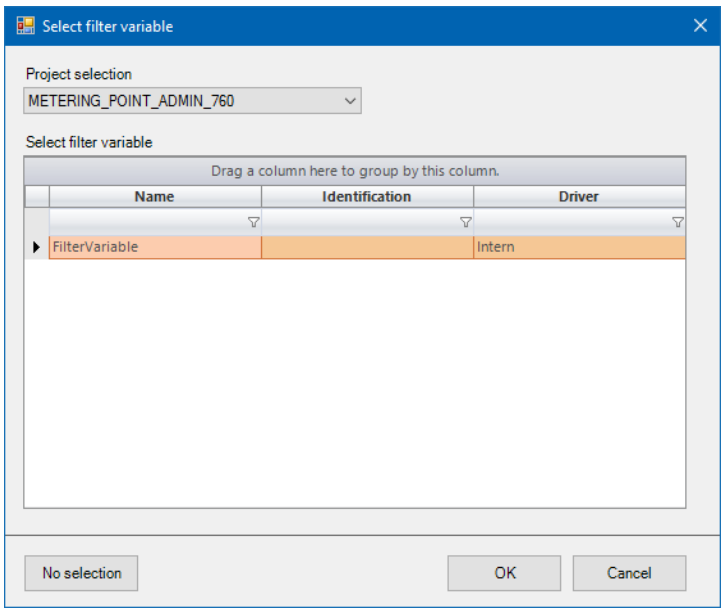


6.2.5 Link filter variable

This dialog can be used to select a variable for filtering in Runtime.

First, create a variable from the *Intern* driver with the *String* **Data Type** and sufficient **String length** (such as *500*) in you project.

Note: The filter is always updated if the variable is updated.

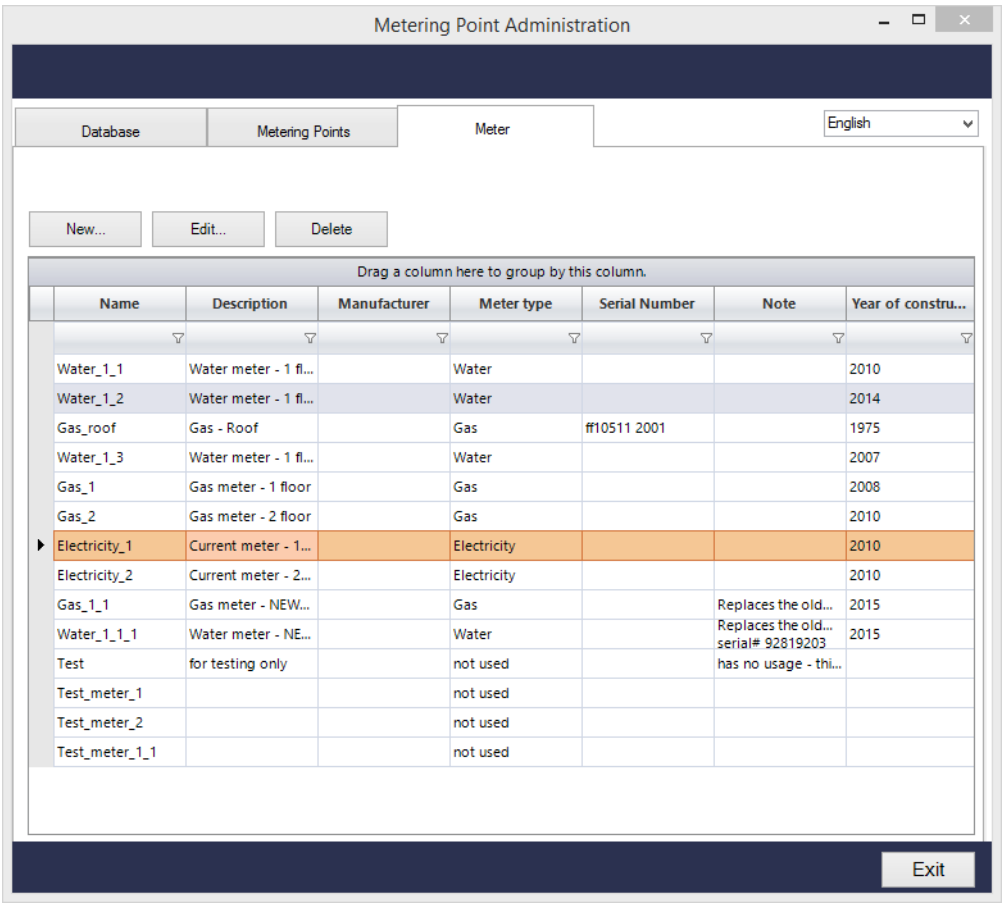


Option	Description
Project selection	Combobox to select the project. A variable from another project can also be selected as a filter variable.
List of variables	Selection of the variable by clicking. The selected metering point is highlighted in color. Multiple selection is not possible. ▸ *Name* Name of the variable ▸ *Identification* Identification of the variable ▸ *Driver* Driver on which the variable is based
No selection	Deletes the variable selection and closes the dialog.
OK	Applies settings and closes the dialog.
Cancel	Discards all changes and closes the dialog.

This variable is used for filtering in Runtime. You can find detailed information on this in chapterFiltering of metering points by means of variable (on page 76).

6.3 Counter

In this tab, there is the possibility to create new meters, to administer them and to display the meters that have already been created in a list.



Option	Description
New...	Opens the dialog to create a new meter (on page 44).
Edit...	Opens a dialog to edit the selected meter (on page 46).
Delete	Deletes the selected meter.

LIST OF THE CONFIGURED METERS

Option	Description
Name	Name of the meter.
Description	Description of the meter.

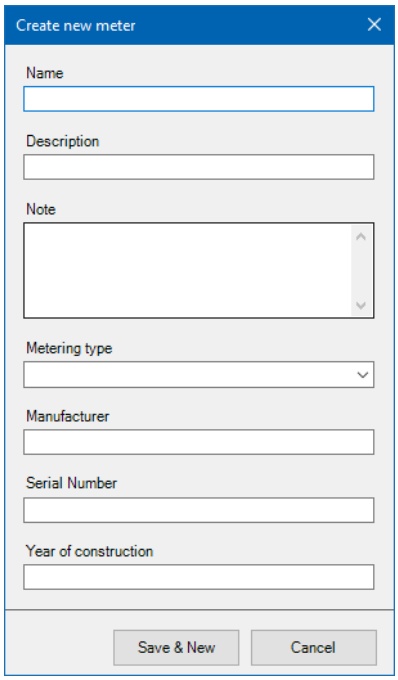
Option	Description
Manufacturer	Manufacturer of the meter.
Meter type	Type assignment of the meter.
Serial number	Serial number of the meter.
Comment	Note for the meter.
Year of construction	Year of construction of the meter.

CLOSE DIALOG

Button	Description
Exit	Closes the wizard. Changes that have not been saved are lost.

6.3.1 Create new meter

In this dialog (both in the wizard and in Runtime), meters are configured or existing project configurations are amended.



Option	Description
Name	Identification of the meter. *Mandatory field*
Description	Description for the meter. *Optional entry*
Comment	Note in relation to the meter. *Optional entry*
MeteringType	Type assignment of the meter. Drop-down list with types that have already been configured. This drop-down list also corresponds to the type list for the creation of a new metering point. *Optional entry*
Manufacturer	Name of the manufacturer of the meter. *Optional entry*
Serial number	Serial number of the meter. *Optional entry*
Year of construction	Year of construction of the meter. *Optional entry*

CLOSE DIALOG

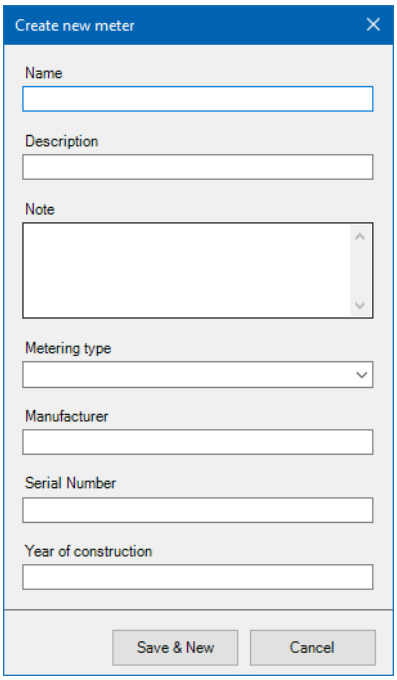
Option	Description
Save & New	Saves the new meter. The dialog to create a new meter is then called up with empty content again. Other meters can be configured.
Cancel	Discards all changes and closes the dialog.

Note: Once the entries have been saved, a new entry is written to the database and the new entry is added to the list.

6.3.1.1 Configuration of a meter

To create a new meter, proceed as follows:

1. Click on the **Meter** button in the wizard
2. Click on **New**.
3. The dialog to create a new meter or amend an existing one is opened.



4. Enter the information about the meter.

Note: Incorrect entries are signaled by a red warning triangle next to the input field.

6.3.2 Edit meter

To edit a meter that already exists, proceed as follows:

1. Switch to the **Meter** tab.
2. Select the corresponding meter in the list of the configured meters.
3. Click on **Edit**.
4. The **Edit meter** dialog is opened.
5. Add any other desired information and administer the meter as you wish.
6. Click on **Save & Close**.

6.3.3 Delete meter

To delete an existing meter, proceed as follows:

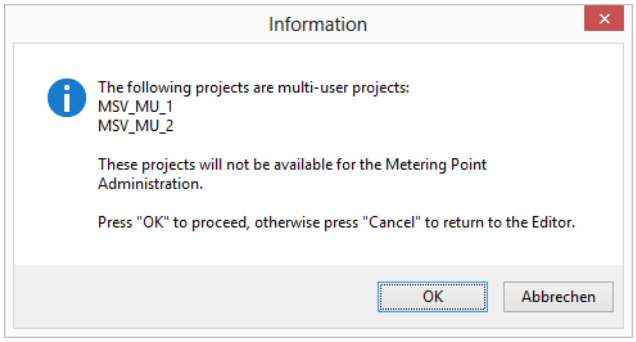
1. Select a meter that you want to delete in the **Meter** tab.
2. Then click on the **Delete** button and confirm the warning dialog with **OK.**
3. The meter you have elected is deleted.

Note: If a meter is already connected to a metering point, it cannot be deleted. The **Delete** button is grayed out in this case. To delete a meter that has already been assigned, it must first be deleted from the metering point or replaced in Runtime.

6.4 Multi-user projects

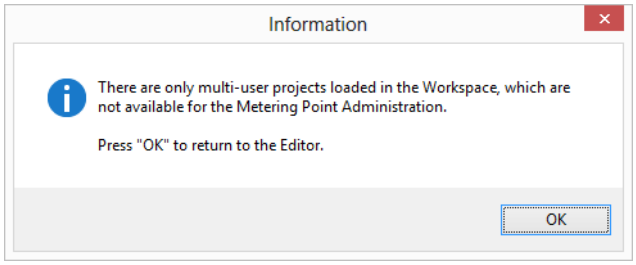
The wizard for metering point administration in the zenon Editor does not support multi-user projects.

If there are multi-user projects in the workspace, a dialog is shown accordingly when the wizard is started:



Note: This dialog is only available in English.

If there are only multi-user projects in the workspace, the following message is given:



Note: This dialog is only available in English.

CONVERT MULTI-USER PROJECT TO STANDARD PROJECT

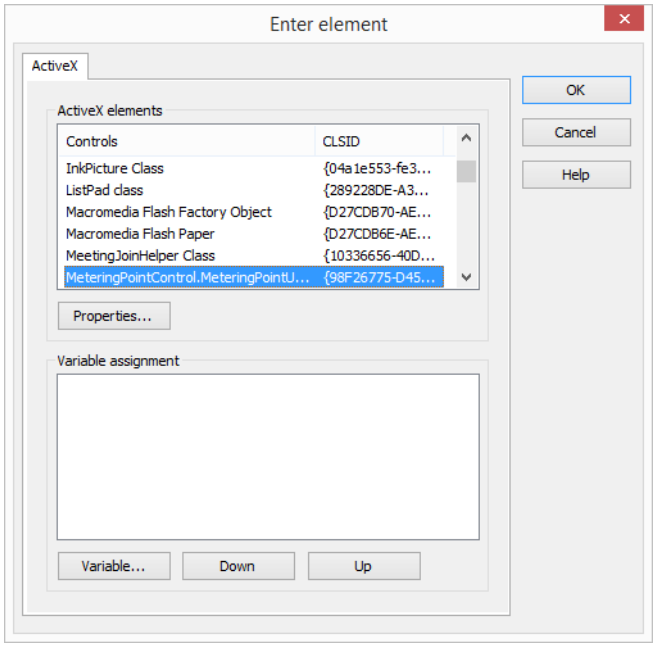
A multi-user project can be converted to a "non-multi-user" standard zenon project:

1. Create a project copy:
   Select, in the context menu of the respective project, the **Project** -> **Save as ...** command.
   The dialog to back up the project data is opened.
2. Give it a new name.
3. The backed-up project is read back as a new "non-multi-user" project in the current workspace and created.

> **Information**
>
> If the project is in an association of multi-user projects, the project references must be taken into account.
>
> You can find further information in relation to this in the Project administration and workspace manual in the Replace project references chapter.

7 Engineering in the zenon Editor

In zenon Editor, configure an *ActiveX element* in a screen in order to be able to use **metering point administration** in Runtime.



1. To do this, create a new screen in zenon Editor.
2. Select the **ActiveX** element and draw an area in the screen with it.
3. The **Enter element** dialog is opened.

4. In this dialog, select **MeteringPointControl.MeteringPointUserControl** from the list of the **ActiveX elements**.

Attention: The ActiveX element must be at least *900 pixels* wide and *575 pixels* high in order for it to be shown correctly in Runtime.

Information

You can find information about the ActiveX element in the Screens manual in the Screen elements/ActiveX chapter.

8 Metering Point Administration in the Runtime

The following is carried out in Runtime:

- Configured metering points and meters are linked to one another.
- New meters are created.
- Existing meter information is amended.
- Manual values are entered.

8.1 Database

Parameter	Description
Database Host	Drop-down list for the selection of the database server. Select, for example, your computer in this field. **Note:** Your computer is shown as a default when the tab is opened.
Authentication	Drop-down list for selection of the login method: ▸ **Windows Authentication** (Default):

Parameter	Description
	The login to the database is carried out with the information of the user logged in to the local computer. ▸ **SQL Server Authentication**: User name and password are entered manually. The corresponding login data must be available for database login.
User name	User name for login to a database. Grayed out if the authentication is **Windows Authentication**.
Password	Password for login to a database. For security reasons, each letter is shown with a * when the password is entered. Grayed out if the authentication is **Windows Authentication**.
Connect	Establishes the connection to the configured database server. If no connection is possible (for example due to incorrect entry of user name or password), an error message is called up. Grayed out if it is already connected to a database server.
Disconnect	Disconnects an existing connection to a database server. Grayed out if no connection is active.
Database Name	Drop-down list to select a database. This list shows all available databases of the database server configured under **Database host**. If this list is empty, there is no connection to a database server or there is no SQL database available on the selected computer.
Start configuration	Switches to the **Metering point** tab. If there is not currently a connection to a database,

Parameter	Description
	a connection with the login information that has already been entered is established when clicking on the **Start configuration** button. If this input is incorrect or incomplete, no further settings can be changed in the **Metering points** or **Meters** tabs. A connection to a database is always necessary for this!

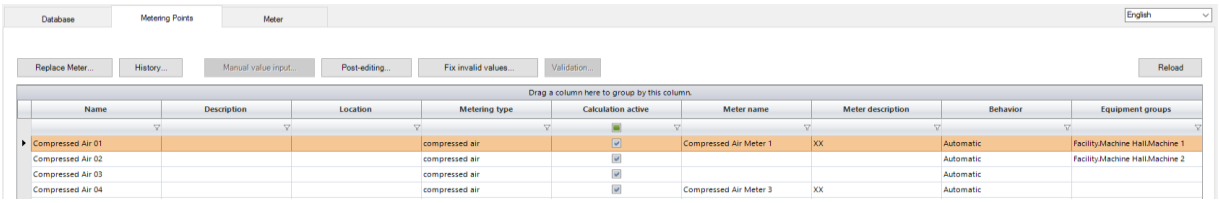
CLOSE DIALOG

Button	Description
Exit	Closes the wizard. Changes that have not been saved are lost.

> **Information**
>
> If there is already a connection to a database, all input fields are grayed out.

8.2 Metering Points

Metering points in zenon Runtime can be administered in this tab.



Option	Description
Assign Meter... (on page 53)	Only active if the selected metering point has not been assigned a meter.
History... (on page 59)	Keeps a log of edited metering points and replaced meters.
Replace Meter... (on page 53)	Only active if the selected metering point has already been assigned a meter.
Manual value input... (on page 61)	Allows manual value input for the desired metering point.

Option	Description
	If, in the list of metering points, an automatic metering point is selected, the **Manual entry of values** button is grayed out.
Manual post processing... (on page 64)	Allows subsequent manual editing of relative values of metering points.
Fix invalid values... (on page 68)	Opens the **Fix invalid values** dialog. Allows the determination, display and correction of invalid values. Only available for *automatic* metering points. **Note:** Multiple selection of metering points for the correction of the values of several metering points is possible.
Validation... (on page 72)	Allows the taking and modification of values from a *validation* metering point. Only active if the selected metering point is *Validation*.
Reload	Loads zenon project configurations in Runtime and gets new settings from the database.
List of metering points	List of the created metering points. Selection by means of clicking. The selected metering point is highlighted in color. ▸ *Name* Name of the metering point ▸ *Description* Short description of the metering point ▸ *Location* Location of the metering point ▸ *Metering point Type* Type of the metering point ▸ *Calculation active* Active if **Calculate relative value** has been *activated*. ▸ *Meter name*

Option	Description
	▸ *Meter description* ▸ *Behavior* Metering Point Administration ▸ *Equipment groups*

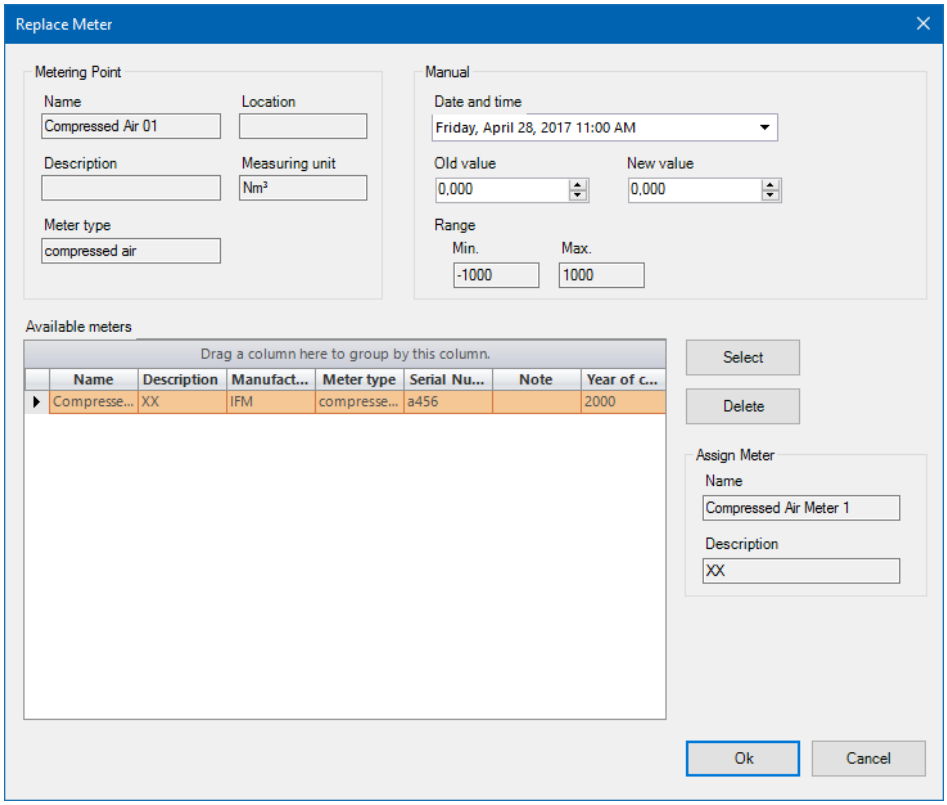
Information

If a variable of a project is not available, this is signalized by a red warning symbol in the list view. In this case, check to see if a project with these variables is loaded.

8.2.1 Assign, replace or remove meter

In this dialog, individual meters can be assigned to a metering point, amended or removed.

With automatic metering points, the dialog for subsequent editing (on page 64) always opens when there is a change to the allocation of meters (new assignment, change, deletion).



METERING POINT

Option	Description
Name	Name of the metering point. Cannot be changed in this dialog.
Location	Location of the metering point. Cannot be changed in this dialog.
Description	Description of the metering point. Cannot be changed in this dialog.
Measuring unit	Measuring unit of the metering point. Cannot be changed in this dialog.
Meter type	Type of meter. Cannot be changed in this dialog.

MANUAL

Option	Description
Date and time	Date and time of the meter allocation or meter replacement. Default:Query time period, rounded up to a complete hour. Clicking on the drop-down list opens a dialog to select the date and time. **Note:** Only the entry of dates from 1. 1. 2000 is possible. Calls before this date are not valid and are signalized by a red warning symbol.
Range	The range of the absolute value variable.
Min.	Minimum input range. Cannot be changed in this dialog.
Max.	Maximum input range. Cannot be changed in this dialog.

Option	Description
Old value	Value of the old meter at the time of replacement. Default: *0* **Note**: Only visible when a meter is replaced.
New value	Value of the new meter at the time of replacement. Default: *0* **Note:** If the entry is outside the input range of the variable (min./max.), the incorrect entry is automatically amended to the range.

AVAILABLE METERS

Option	Description
Available meters	List of available meters All meters of the appropriate meter type that are not yet assigned to a metering point are displayed. Only one meter per metering point can be assigned.
Select	Assigns the selected meter and transfers its values to the **Assign meter** range.
Delete	Deletes the assignment of a meter to a metering point. The meter itself is not deleted and remains in the list of meters.

ASSIGN METER

Option	Description
Name	Name of the assigned meter. Cannot be changed in this dialog.
Description	Description of the assigned meter Cannot be changed in this dialog.

CLOSE DIALOG

Option	Description
OK	**Applies settings and closes the dialog.**
Cancel	Discards all changes and closes the dialog.

8.2.1.1 Project configuration - meter assignment

To assign a meter to a metering point or to amend an existing assignment:

1. Select a metering point in the **list of metering points**.
2. Click on:
   a) **Assign Meter** if the meter has not yet been assigned to a meter.
   b) **Replace Meter** if the meter has already been assigned to a meter.
3. The **Assign Meter/Replace Meter** dialog is opened.
4. If there is a meter replacement or allocation, enter the current value of the newly-assigned meter in the **New value** input field.
   A warning dialog appears if this value is already present in the archive.
   Entries that do not correspond to the input range are automatically amended to the maximum or minimum value.
   Note: For automatic metering points, the value entered here in the **dialog for subsequent editing** is shown in green in the **Absolute value** column.
5. In the event of a meter replacement or when a meter assignment is deleted:
   Also enter the current value of the meter to be replaced or deleted in the **Old value** input field.
   Entries that do not correspond to the input range are automatically amended to the maximum value or minimum value.
   Note: For automatic metering points, the value entered here in the **dialog for subsequent editing** is shown in green in the **Absolute value** column.
6. Select a meter from the list of **available meters**.
   Note: All meters with the same metering point type as the selected metering point are displayed here.
7. Configure the meter assignment:
   a) Click on the **Select** button to assign the selected meter to the metering point.
   b) Click on the **Delete** button to release a meter that has already been assigned from the metering point.
8. The selected meter is:
   a) Applied in the **Assign Meter** area.

b) Removed from the **Assign meter** area.

9. Click on **OK** to end the assignment.
10. The dialog is closed:
    a) For manual metering points:
    Absolute values are written to the absolute value archive. Corresponding relative values are calculated automatically and written to the relative value archive.
    b) For automatic metering points:
    The dialog for subsequent editing is opened.

8.2.1.2 Meter assignment for manual metering points

Values are automatically written to the archive depending on the action:

1. Assign meter:
   New value
2. Remove meter:
   Old value
3. Replace meter:
   Both values
   Note: Time stamp for replacement:
   a) Old value: Current time stamp
   b) New value: Two seconds later than the time stamp of the old value.

RELATIVE VALUE CALCULATION

The relative values are automatically recalculated.

1. During assignment:
   a) Relative values between the new value and the last absolute value found before that are recalculated.
   a) Relative values between the new value and the first absolute value found after that are recalculated.
2. During deletion:
   a) Relative values between the old value and the last absolute value found before that are subsequently calculated.
   b) Relative values between the old value and the first absolute value found after that are recalculated.

3. When replacing:
    a) Relative values between the old value and the last absolute value found before that are subsequently calculated.
    b) Relative values between the new value and the first absolute value found after that are recalculated.

EXAMPLE OF A METER REPLACEMENT:

Maintenance should be carried out every 11 operations.

The last maintenance was carried out when the counter reading was 90. The current counter value is 99 operations.

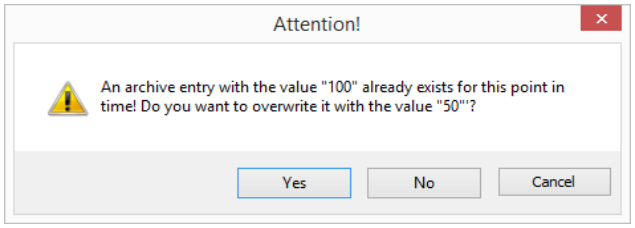
The next maintenance must therefore be carried out 2 operations later when the counter reading is 101.

If the counter now breaks down, it must be replaced with another counter. This has the counter value 12.

Because the next maintenance is due 2 operations later, it is to be carried out when the counter reading is 14.

WARNING DIALOG

If a meter replacement is carried out at a time at which an archive entry already exists, this must be overwritten. A dialog warns of this.



Option	Description
Yes	Applies settings and closes the dialog.
No	Discards all changes and closes the dialog.
Cancel	Retains all changes. The changes are not carried out. The dialog remains open for corrections.

8.2.1.3 Meter assignment for automatic metering points

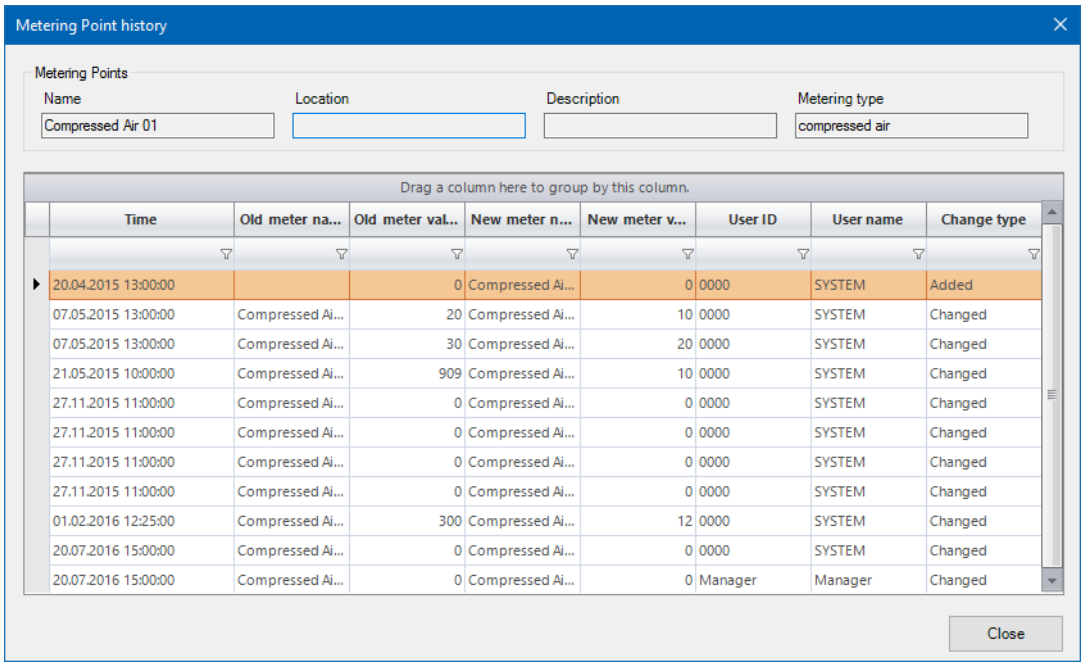
With automatic metering points, the post editing dialog (on page 64) always opens when amending the assignment of a meter. The values configured in the allocation dialog (**Old value** and **New value**) are shown in green in the **Absolute value** column. The respective time stamp is increased by two seconds.

Information

The new values are only applied to the relative value archive after completion of the project configuration in the post editing dialog!

8.2.2 History

The metering point history dialog shows the course of configuration of the selected metering point. Changes are not possible in this dialog.



Option	Description
Name	Name of the metering point. Cannot be changed in this dialog.
Location	Location of the metering point. Cannot be changed in this dialog.
Description	Description of the metering point.

Option	Description
	Cannot be changed in this dialog.
MeteringType	Type of the metering point Cannot be changed in this dialog.

HISTORY

Option	Description
Time	Time of the meter assignment or the meter replacement.
Old meter name	Name of the old meter.
Old meter value	Value of the old meter.
New meter name	Name of the new meter.
New meter value	Value of the new meter.
User ID	ID of the user who has entered the meter replacement.
User name	Name of the user who has entered the meter replacement.
Change type	The change that has been made is shown. ▸ *Added* When a meter is assigned for the first time = **Assign Meter** ▸ *Changed* When a meter replacement is carried out = **Replace Meter** ▸ *Deleted* The assignment of a meter has been removed. No new meter was assigned to the metering point.
Close	Closes the dialog.

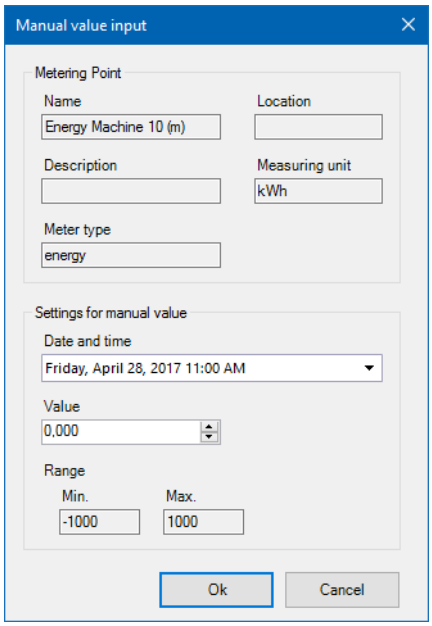
Information

The history only shows changes of meter assignments for a metering point.

Value changes are not displayed in the history.

8.2.3 Manual value input

Manual values can only be entered for manual (i.e. not automatic) metering points. With the manual value entry, values can be entered for a certain point in time. Value entries for the future are not permitted.



METERING POINT

Option	Description
Name	Name of the metering point. Cannot be changed in this dialog.
Location	Location of the metering point. Cannot be changed in this dialog.
Description	Description of the metering point. Cannot be changed in this dialog.

Option	Description
Measuring unit	Measuring unit of the metering point. Cannot be changed in this dialog.
Meter type	Type of meter. Cannot be changed in this dialog.

SETTINGS FOR MANUAL VALUE

Option	Description
Date and time	Date and time of the entry of the absolute value. Clicking on the drop-down list opens a dialog to select the date and time. **Note:** Only the entry of dates from 1. 1. 2000 is possible. Calls before this date are not valid and are signalized by a red warning symbol. Default: Query time point, rounded up to a complete hour.
Value	Absolute value of the manual meter. **Note:** If the entry is outside the input range of the variable (*Min./Max.*), this is signalized by a red warning symbol. Default: *Last-saved absolute value in the archive.*
Range	Range of the absolute value.
Min.	Minimum value of the absolute value variable Cannot be changed in this dialog.
Max.	Maximum value of the absolute value variable Cannot be changed in this dialog.

CLOSE DIALOG

Option	Description
OK	**Applies settings and closes the dialog.**
Cancel	Discards all changes and closes the dialog.

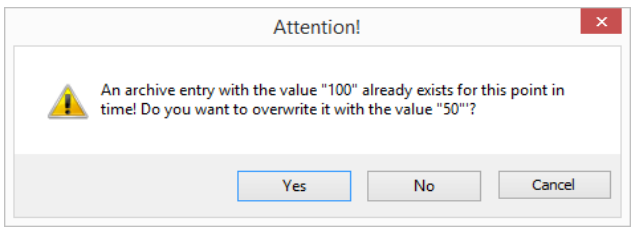
8.2.3.1 Manual value input

To enter values manually:

1. Select a manual metering point from the list of metering points.
2. Click on the **Manual value input** button.
3. The **Manual value input** dialog is opened.
4. Select the date and time of the manual value:
   To do this, click on the **Date and time** drop-down list or enter the corresponding time in the input field directly.
   Attention: Manual value entries must not be in the future!
5. Enter the new value in the input field
   Note: The valid input range of the selected variable is shown under Range.
6. Click **OK** to apply the new value with the configured time stamp.
7. The value input is validated.
   A warning dialog opens if there is already a value for the selected time point.
8. The relative values are automatically recalculated.
   The following takes place after the values are entered:
   a) From the entered value until the last absolute value found is subsequently calculated.
   b) From the entered value until the next subsequent absolute value found is subsequently calculated.

DIALOG IN THE EVENT OF DUPLICATE VALUE ENTRIES

If there is already an archive entry at the selected time point, this must be overwritten. A dialog warns of this.



Option	Description
Yes	Applies settings and closes the dialog.
No	Discards all changes and closes the dialog.

Option	Description
Cancel	Retains all changes. The changes are not carried out. The dialog remains open for corrections.

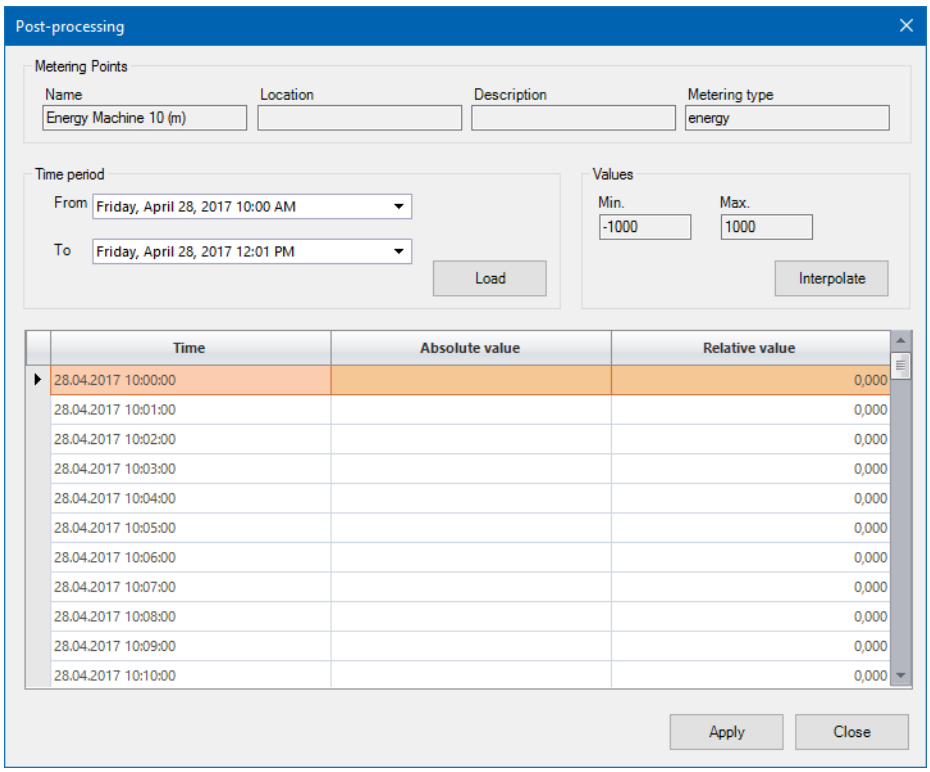
SHOW MANUAL ENTRIES

> **Hint**
>
> To have manual value entries shown, use the **Post-editing** button.

8.2.4 Manual post processing

Values from an archive can be subsequently edited in this dialog. Missing entries for relative values can be interpolated in order to get continuous values and thus, for example, close gaps more quickly as a result.

If, for an automatic metering point, the meter is replaced or deleted, the dialog for subsequent editing also opens.



METERING POINTS

Option	Description
Name	Name of the metering point. Cannot be changed in this dialog.
Location	Location of the metering point. Cannot be changed in this dialog.
Description	Description of the metering point. Cannot be changed in this dialog.
MeteringType	Type of the metering point Cannot be changed in this dialog.

VALUES

Option	Description
Time period	Time range from relative values and absolute values that is to be displayed.
From	Start of the time query Clicking on the drop-down list opens a dialog to select the date and time. **Note:** Only the entry of dates from 1. 1. 2000 is possible. Calls before this date are not valid and are signalized by a red warning symbol. Default: Query time point - 2 h (rounded up to a full minute).
To	End of the time query Clicking on the drop-down list opens a dialog to select the date and time. **Note:** Only the entry of dates from 1. 1. 2000 is possible. Calls before this date are not valid and are signalized by a red warning symbol. Default: Query time point (rounded up to the next whole minute).

Option	Description
Load	Loads the archive files for the absolute and relative values for the selected time range and lists these individually in the list of archive entries.
Interpolate	Calculates the relative values in the range between two selected absolute values. Selection of start and end by clicking and pressing the **Shift key**.
Apply	Writes the changes that have been made into the archive.
Range	Value range of the relative value.
Min.	Minimum value of the relative value variable Cannot be changed in this dialog.
Max.	Maximum value of the relative value variable Cannot be changed in this dialog.

LIST OF ARCHIVE ENTRIES

This list is empty when the dialog is called up. After the query time has been entered and the Load button is clicked on, the list is filled with the archive entries that are found.

Option	Description
Time	Time of the archive entry. Format: *DD.MM.YYYY hh:mm:ss*
Absolute value	Absolute value of the archive entry. **Note:** Values that are transferred from a meter assignment, a meter replacement or a meter deletion are shown in green.
Relative value	Relative value of the archive entry.

CLOSE DIALOG

Option	Description
Close	Closes the dialog.

8.2.4.1 Subsequent editing of values

To edit values subsequently:

1. Select the desired metering point in the **Metering points** tab.
2. Click on the **Post-editing...** button.

   The post editing dialog is opened
3. Select a **time range**.
4. Click on **Load** to load the archive data for the absolute and relative values for the selected time range.

   The value entries that are found are shown in the list.

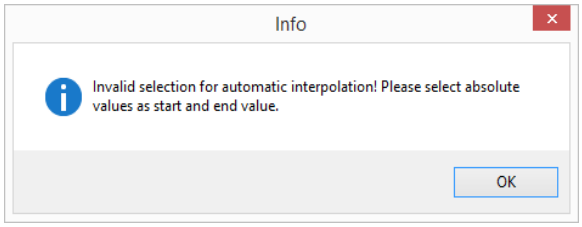
INTERPOLATE VALUES

There must be valid absolute values in order to be able to interpolate values.

1. Go to the list of archive entries and select the absolute values that you want to use for the calculation of relative values.
2. To do this, hold down the **Shift key** and select the start and end values that are to be used for interpolation.
3. Click on **Interpolate** to automatically calculate relative values between these.

   The new values are shown in the relative value column.
4. Click on the **Apply** button to transfer the newly-calculated relative values to the archive.

A dialog is called up if the start or end values for interpolation are not valid:



ENTER RELATIVE VALUES

1. Click on the list of the archive entries for the relative value that you want to change.

   The field to enter the relative value is unlocked.
2. Enter the desired new relative value.

   The entry is validated.

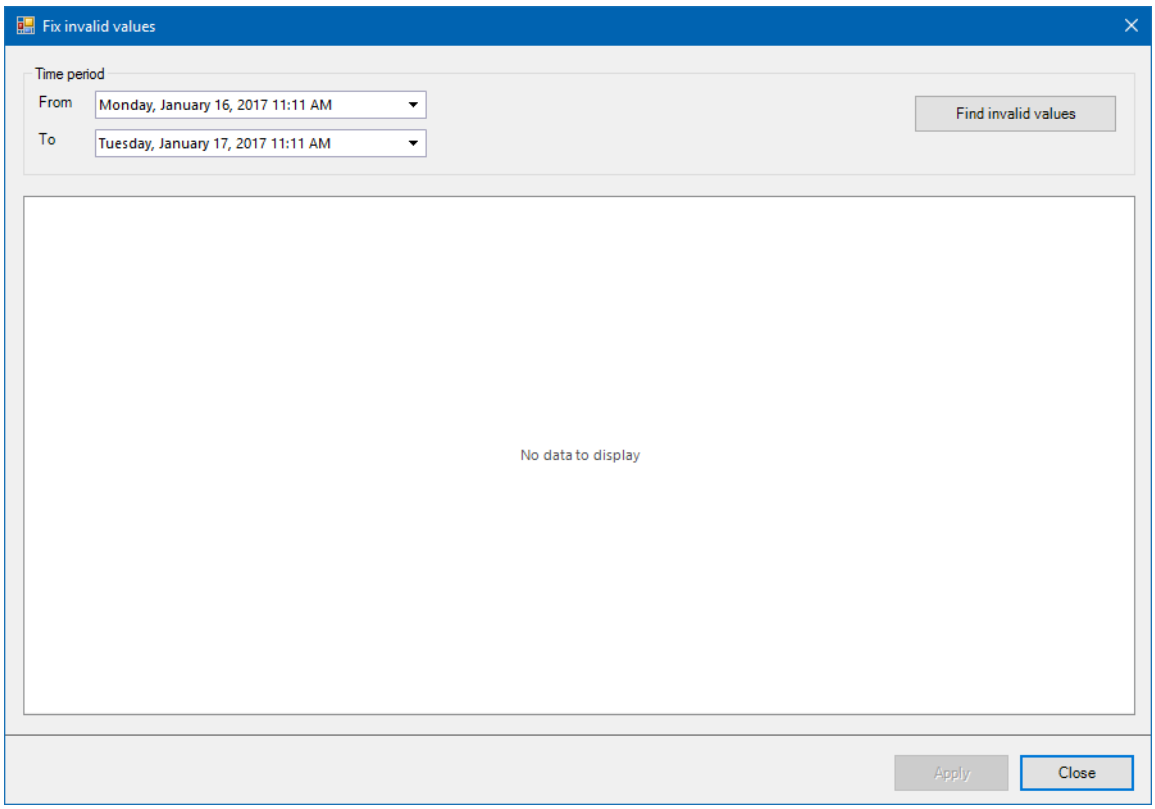
VALIDATION

If the value entered is outside the valid input range, it is not possible to complete the entering of the values in the input field. This is visualized with a red warning symbol at the start of the line. You can get other error details in the tool tip if you move the mouse over the warning symbol.

Note: empty value entries are not permitted. In this case, enter the figure *0*.

8.2.5 Fix invalid values

Invalid values are determined, displayed and corrected in this dialog.



TIME PERIOD

The time range for the determination of invalid values is configured in this area.

Option	Description
From	Start of the time range to be examined. Selection from drop-down dialog or by direct input. Invalid entries are already corrected or suppressed during input. Format: *Weekday, DD. Month YYYY hh:mm*

Option	Description
	Default: *1 day before calling up the dialog*
To	End of the time range to be examined. Selection from drop-down dialog or by direct input. Invalid entries are already corrected or suppressed during input. Format: *Weekday, DD. Month YYYY hh:mm* Default: *Time the dialog is called up*
Search invalid values	Starts the search for possible invalid values for the specified time range. The progress is shown in a bar during the search. The search can be canceled by clicking on the Cancel button. **Note:** A value is invalid if the *18 [INVALID]* status bit is active for this. The relative value archive of the selected metering point is examined.
List of invalid values	List of entries found in the relative value archive with invalid values. Default: *Empty with display text "No data to display"*.

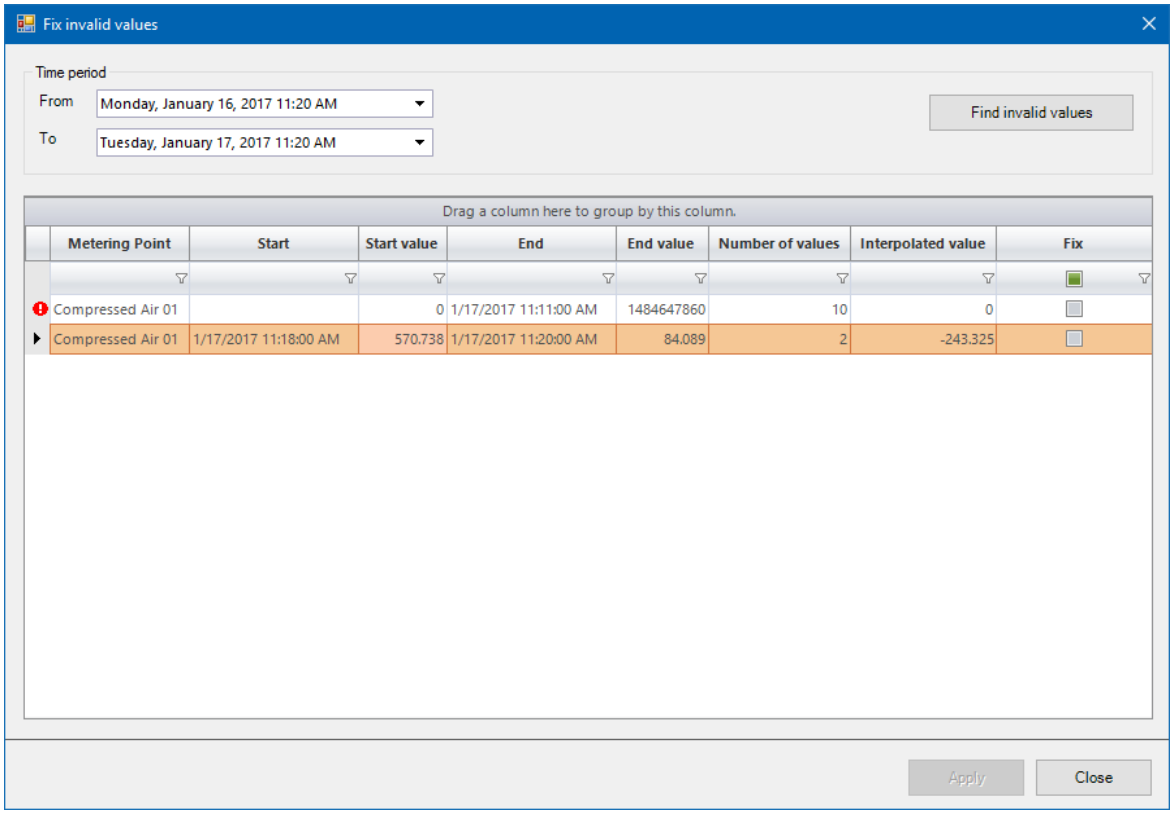
FOOTER

Option	Description
Apply	Starts the correction for the selected entries. Correction is visualized with a progress bar and can be canceled by clicking on the Cancel button. Correction overwrites the incorrect relative values in the archive. **Note:** Corrections are logged for each entry in the CEL. *Relative value correction for the metering point [metering point name]: Start [date], end: [Date], Relative value: [Relative value]*

Option	Description
	Not available if no value is selected for correction or correction is not possible for the selected value.
Close	Closes the dialog.

LIST OF INVALID VALUES

All invalid values are shown in this list.



- Consecutive incorrect values are compiled into one entry.
- Entries that cannot be corrected are marked with a warning symbol (red circle or exclamation mark).
- The possible reason for the prevention of automatic correction is visualized with a tool tip.
- The view of the list can be configured:
  - Move the display width by clicking on the hyphen in the column view and moving the divider.
  - Arrange the columns by means of clicking the mouse and Drag&Drop.
- The list can be sorted and filtered.
  - Sort by clicking on the column heading.

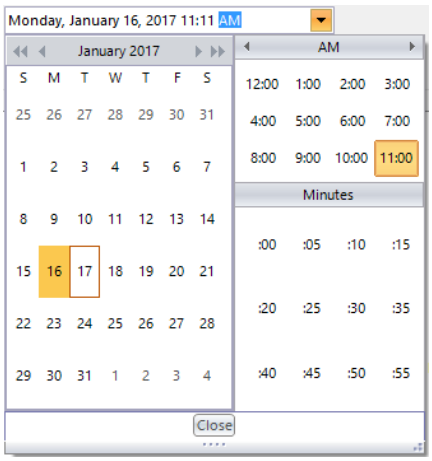
- Filter by entering a filter term into the input field underneath the column heading. The filter criteria can be selected with the context menu

Option	Description
Metering Point	Name of the metering point.
Start	Time stamp of the last valid absolute value.
Start value	Last valid absolute value before an invalid value.
End	Time stamp of the first valid absolute value after an invalid value.
End value	First valid absolute value after an invalid value.
Number of values	Number of invalid relative values in the entry.
Interpolated value	Value that is written to the archive on correction.
Fix	Checkbox for the activation of automatic correction. Default:*inaktiv* **Note:** Clicking on the checkbox in the column header activates correction for all entries. Not available if correction is not possible for the entry (warning symbol).

TIME SELECTION DROP-DOWN DIALOG

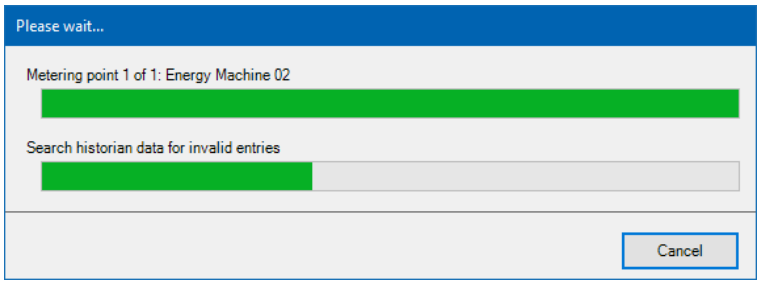
Drop-down dialog to select the start time and end time for the determination of the invalid entries. Selection by means of mouse click.

Note: The drop-down dialog is only available in English.



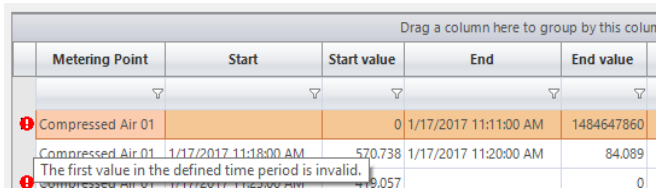
PROGRESS BAR

Progress bar when determining the correction of invalid values.



INVALID VALUES

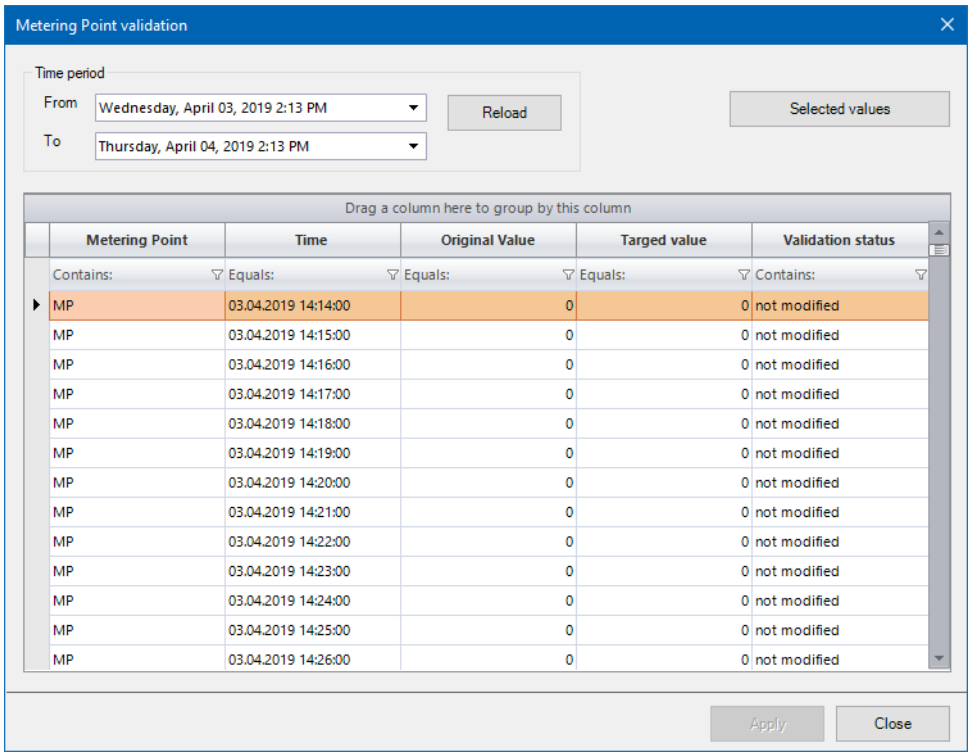
Visualization and tool tip for values that cannot be corrected.



8.2.6 Validation

In the **metering point validation** dialog, all archive values in the selected time range are shown for the configured metering point in a list.

The individual values can be confirmed and modified.



TIME PERIOD

Time filter for the display of variables from the archive.

Option	Description
From	Validation start time. Selection using calendar.
To	Validation end time. Selection using calendar.
Reload	Updates the list of values with the configured time range.
Selected validation	Clicking on the **Validate Selected** button sets the validation type to *confirmed* for all selected entries.

LIST OF VALUES

The list of values shows all archive entries of the archives configured for the metering point.

The list can be sorted and filtered.

- Click on a column heading to sort the list.

- Another click reverses the sorting order.
- Right clicking on a column heading activates the context menu for the configuration of filtering.

Option	Description
Metering Point	Name of the metering point as configured. **Note:** cannot be changed
Time	Time stamp of the archive value. **Note:** cannot be changed
Source value	Value from source archive. **Note:** cannot be changed
Target value	Target value as applied after validation: ▸ The original value from the source archive is entered by default. ▸ The target value is 0 if there is not yet any value in the archive. A new target value is entered: ▸ By double-clicking in the entry's target value cell ▸ By entering the target value in the cell manually. Input takes valid counter values into account. There is no check of the limit values. The validation type is amended to *manipulated* after the value has changed.
Validation type	Editing status of the value ▸ *Unedited*: Value has not yet been confirmed or amended. ▸ *Edited*: The target value has been amended. **Note:** Amended entries are shown in the list in blue. ▸ *Confirmed*: Value has been confirmed. **Note:** Confirmed values are shown in green in the list.

CLOSE DIALOG

Option	Description
Close	Closes the dialog. Before the closing process, a check is carried out to see whether all loaded values have been confirmed or processed. If there are still unconfirmed or corrected values in the list (validation type: *unprocessed*), this is shown with a dialog.
Apply	Applies settings and writes amended values to the archive. For each value that is written to the target archive, a corresponding CEL entry is also created.

DIALOG - MISSING VALIDATION

Clicking on the **Close** button instigates a check for the *unprocessed* validation type. If there are still entries with the *unprocessed* validation type present, this is shown in a notice dialog.

Option	Description
OK	Closes the dialog. **Attention:** Values that have not been applied are thus not transferred to the archive.
Cancel	Returns to the **metering point validation** dialog. Further configuration can be carried out.

8.2.6.1 Validation - Operation in the Runtime

In order to validate entries of a metering point in Runtime:

- Go to the **Metering Points** tab:
  A list of configured metering points is shown.
- Highlight the metering point with the *validation* action.
- Click on the **Validation** button:
  The **metering point validation** dialog is opened.
  Opening this dialog can take some time depending on the size of the archive entries. This loading process is shown.
- Validate the data:
  - Modify the corresponding entries with new values.

- Confirm the existing entries for which no changes are necessary.
  To do this, use multiple selection and the **Validate selected** button.
  Individual entries can be confirmed by double-clicking in the **target value** line.

- Click on the **Apply** button to write your amendments to the target archive.
  Successful saving of the data in the target archive is visualized with a green tick next to the button.
  The status of an edited entry is set to manual value (**MAN_VAL**).
- Carry out further amendments.
- End the validation by clicking on the **Close** button.
  Before closing the dialog, the list is checked for entries that have not yet been confirmed.
- The validation dialog is closed by clicking on the **OK** button.

> **Information**
>
> Entries that have already been amended or transferred (validation type: *validated*) can be amended again. These get the *edited* validation type again after a change. Ensure that each change is transferred to the archive with the **Apply** button.

8.2.7 Filtering of meters by means of variable

You have the possibility to filter the list of metering points according to certain criteria. To achieve this, write a corresponding value to the filter variable (on page 41).

> **Hint**
>
> You can define a filter string for each user and set this to the filter variable using a recipe when the user is logged in.
>
> You thus have each user only having the metering points that are relevant to them visible in the list.
>
> This filtering can also be used for more simple validation, in that all metering points that are not relevant to validation are removed from the filter and the remaining ones are automatically selected.

The following is applicable for filtering:

- A filter can be defined for each column
- Individual filter strings are separated by **#**
- The divider within a filter string is an empty space

- The arrangement of the elements in the filter string is as desired
- All filtered entries are automatically selected with the **SelectAll** string

Structure of a filter string

Operator filter value column code

OVERVIEW OF COLUMN CODES AND OPERATORS FOR FILTERING

The following column codes and operators are available

OVERVIEW OF THE COLUMN CODES

Code	Column
na	Name
de	Description
lo	Location
mt	MeteringType
ca	Calculation active
mn	Meter name
md	Meter description
bh	Behavior
eq	Equipment groups

OVERVIEW FOR OPERATORS

The number or string can be chosen to be used as an operator.

Number	String
0	None
1	IsLike
2	IsNotLike
3	IsLessThan
4	IsLessThanOrEqualTo
5	IsEqualTo

Number	String
6	IsNotEqualTo
7	IsGreaterThanOrEqualTo
8	IsGreaterThan
9	StartsWith
10	EndsWith
11	Contains
12	NotContains
13	IsNull
14	IsNotNull
15	IsContainedIn

EXAMPLES

Entry in the **Name** column contains the *Com* string:
Value of the filter variable: **na Contains Com**

Calculation active is set:
Value of the filter variable: **ca 5 True**

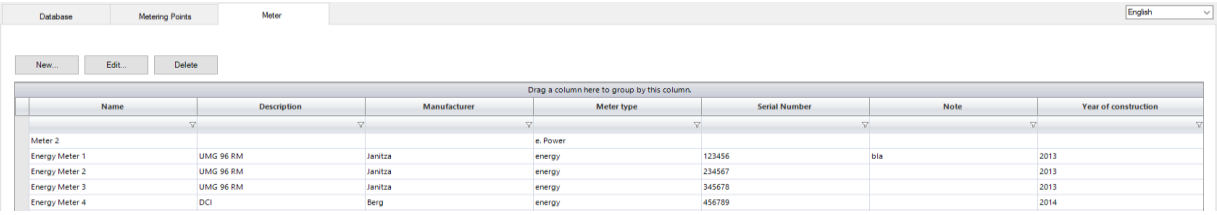
Entry in the **Behavior** column starts with *Auto*, automatic selection of the filtered entries:
Value of the filter variable: **bh StartsWith Auto#SelectAll**

Combination of all three filters:
Value of the filter variable: **na Contains Com#ca 5 True#bh StartsWidth Auto#SelectAll**

If a filter string contains invalid values, the other filter strings are nevertheless applied.

8.3 Counter

Meters are administered in Runtime in this tab.



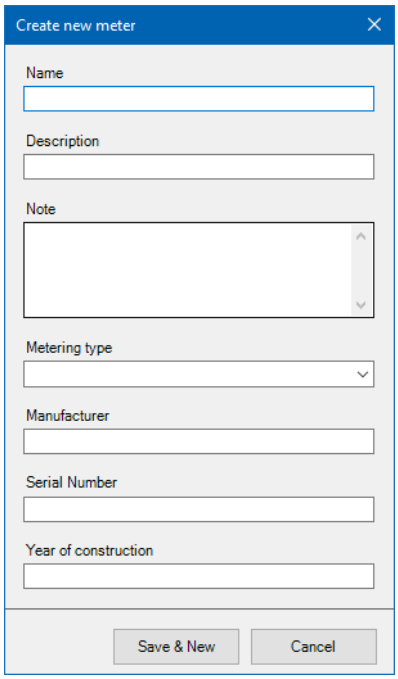
Option	Description
New (on page 44)	Opens the dialog to create a new meter.
Edit (on page 46)	Opens the dialog to edit the selected meter.
Delete (on page 47)	Deletes the selected meter.

LIST OF THE METERS

Option	Description
Name	Name of the meter that has been created.
Description	Description of the meter.
Manufacturer	Manufacturer of the meter.
Meter type	Meter type of the meter.
Serial number	Serial number of the meter.
Comment	Note in relation to the meter that has been created.
Year of construction	Year of construction of the meter.

8.3.1 Create new meter

In this dialog (both in the wizard and in Runtime), meters are configured or existing project configurations are amended.



Option	Description
Name	Identification of the meter. *Mandatory field*
Description	Description for the meter. *Optional entry*
Comment	Note in relation to the meter. *Optional entry*
MeteringType	Type assignment of the meter. Drop-down list with types that have already been configured. This drop-down list also corresponds to the type list for the creation of a new metering point. *Optional entry*
Manufacturer	Name of the manufacturer of the meter. *Optional entry*

Option	Description
Serial number	Serial number of the meter. *Optional entry*
Year of construction	Year of construction of the meter. *Optional entry*

CLOSE DIALOG

Option	Description
Save & New	Saves the new meter. The dialog to create a new meter is then called up with empty content again. Other meters can be configured.
Cancel	Discards all changes and closes the dialog.

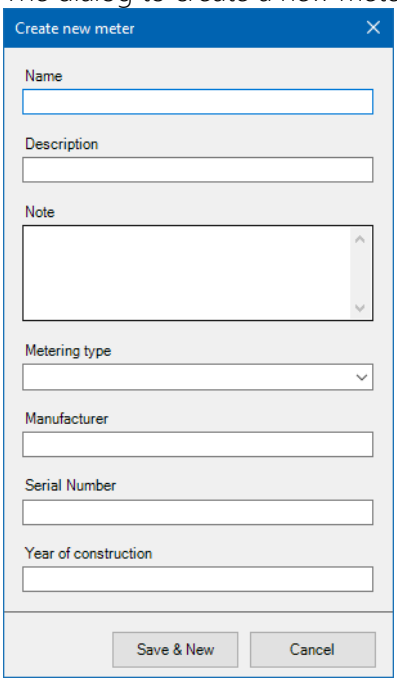
Note: Once the entries have been saved, a new entry is written to the database and the new entry is added to the list.

8.3.1.1 Configuration of a meter in Runtime

To create a new meter, proceed as follows:

1. Click on the **Meter** tab.

2. Click on **New**.
3. The dialog to create a new meter or amend an existing one is opened.



4. Enter the information about the meter.

Note: Incorrect entries are signaled by a red warning triangle next to the input field.

8.3.2 Edit meter

To edit a meter that already exists, proceed as follows:

1. Switch to the **Meter** tab.
2. Select the corresponding meter in the list of the configured meters.
3. Click on **Edit**.
4. The **Edit meter** dialog is opened.
5. Add any other desired information and administer the meter as you wish.
6. Click on **Save & Close**.

8.3.3 Delete meter

To delete an existing meter, proceed as follows:

1. Select a meter that you want to delete in the **Meter** tab.
2. Then click on the **Delete** button and confirm the warning dialog with **OK.**
3. The meter you have elected is deleted.

Note: If a meter is already connected to a metering point, it cannot be deleted. The **Delete** button is grayed out in this case. To delete a meter that has already been assigned, it must first be deleted from the metering point or replaced in Runtime.

8.4 Metering Point Administration in the zenon network

If the **metering point administration** in the Runtime is executed on a client and the primary server fails, the module is deactivated. A corresponding message is shown in zenon Runtime.

Entry of dialogs that are still open at the time of the server failure are ignored. This ensures that there is no inconsistent data between zenon archives / Chronological Event List and the metering point history.

The module is active again as soon as the primary server can be reached again.

9 zenon Logic components of metering point administration

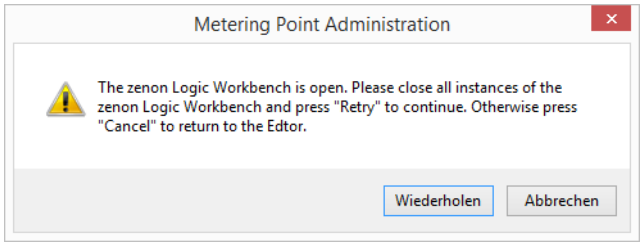
The calculation of relative values with automatic metering points is implemented with the **Calculate relative value** setting active with zenon Logic.

Necessary configurations are automatically applied by the **metering point administration**. You can find information about these automated steps in the **Summary** (on page 31) tab of the *Metering Point Administration* wizard in zenon Editor. You are informed of any problems that occur in this tab.

9.1 Check for open zenon Logic Workbench

When starting the **Metering point Administration** in the zenon Editor, a check is first made to see whether zenon Logic Workbench is open. To avoid incorrect configurations, you are requested to close zenon Logic Workbench if it is open. The wizard cannot be started if Workbench is open!

Note: This dialog is only available in English.



Option	Description
Redo	Another check for open zenon Logic Workbench. If zenon Logic Workbench is not open, the wizard is loaded. If zenon Logic Workbench is still open, the error dialog appears again.
Cancel	Cancels the opening of the metering point administration.

9.2 zenon Logic project configurations for metering point administration

When creating automatic metering points with the **Calculate relative value** setting activated, the following actions are carried out in the background:

CREATION OF A DRIVER

1. Typ STRATONNG
2. Name: MeteringPoint
3. Amendment of the driver settings
   a) Host: localhost
   b) Port: 14731
   The port number is increasing by 1 for every loaded project if there are many projects in the workspace.

CREATION OF A ZENON LOGIC PROJECT

1. Name: MeteringPoint
2. Host: localhost

3. Port: 14731
   The port number is increasing by 1 for every loaded project if there are many projects in the workspace.

CREATION OF A PROGRAM IN THE ZENON LOGIC PROJECT FOR THE CALCULATION OF RELATIVE VALUES

Name: *RelativeValueCalculation*

Once configuration has been completed, the zenon Logic project and the zenon project are compiled.

The zenon Logic Workbench must be closed during the configuration of a metering point in the wizard. If there is a problem, a corresponding warning message appears in the Summary of the wizard (on page 31).

Attention

All manual changes to the **MeteringPoint** driver, as well as the changes to the zenon Logic *MeteringPoint* project (including *RelativValueCalculation* program) can lead to automatic relative value calculation no longer working.

9.3 Apply changes in zenon Logic

Changes to the configuration of metering points can lead to changes in the zenon Logic Program (on page 83).

These changes are not applied in zenon Runtime by reloading. The current zenon Logic program is only loaded when Runtime is restarted.

Example

Change to the cycle time of an existing archive.

In order for correct calculations to take place for a metering point with calculated relative values (**Calculate relative value** property active), zenon Runtime must be restarted.

9.4 VACO function block

The VACO function block in zenon Logic carries out the calculation of relative values.

When creating automatic metering points with the **"Calculate relative value"** setting activated, an instance of the function block is created in the zenon Logic program *RelativValueCalculation* for the corresponding metering point. If an automatic metering point with activated relative value calculation is deleted or the relative value calculation for an automatic metering point is deactivated, the attendant project configurations (variables and lines of code) are removed in zenon Logic.

PROGRAMMING - SOURCE CODE

```
//Instance for Metering Point MessstellenName

VACO_MeteringPointID(Enable(ENA), FunctionTrigger(TF), Holding Time(HT),ResetTrigger(RST), Delta, IN(AbsoluteValue));

{RelativVariablenName}:=ANY_TO_DatenTypRelativVariable(VACO_0001);

{ArchivTriggerVariablenName}:=VACO_MessstellenID.TA;
```

Note: You can find details on function blocks in the zenon Logic documentation.

9.5 ArchivTrigger function block

The ArchivTrigger function block carries out the necessary calculations (in the background) in order to trigger cyclical archives with the configured cycle time.

If the project configuration of a cyclical archive for the metering point administration in zenon is changed, the zenon Logic program is automatically updated after the wizard is opened.

PROGRAMMING - SOURCE CODE

```
//Instance for Trigger RE

Trigger_RE(ULINT#1420066800,ULINT#900,ULINT#28800,False,False,False);

OUT_TF_RE:=Trigger_RE.TF;
```

Note: You can find details on function blocks in the zenon Logic documentation.