COPADATA
do it your way

zenon manual

Measuring unit conversion

v.7.50

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1. Welcome to COPA-DATA help

GENERAL HELP

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

PROJECT SUPPORT

You can receive support for any real project you may have from our Support Team, who you can contact via email at support@copadata.com (mailto:support@copadata.com).

LICENSES AND MODULES

If you find that you need other modules or licenses, our staff will be happy to help you. Email sales@copadata.com (mailto:sales@copadata.com).

2. Measuring unit conversion

measuring unit conversion enables conversion and switching of base units into conversion units, for example meters into yards or meters into decimeters, centimeters and millimeters. A base unit contains the initial value for a conversion. The conversion measuring unit contains the converted value in relation to the base value. Both have a unit name. A **Factor**, a **Offset** and a **Shift of the decimal point** can be defined for conversion units, based on the relevant base unit.

A base unit can be selected when setting parameters for a variable. It is possible to switch between the different units during runtime using the Unit switching (on page 10) function.

License information

Part of the standard license of the Editor and Runtime.

CONTEXT MENU PROJECT MANAGER

Menu item	Action
New base unit	Creates a new base unit.
Export XML all	Exports all entries as an XML file.
Import XML	Imports measuring units from an XML file.
Help	Opens online help.

Information

You must not use the unit conversion together with the variablerw Report function. This Report function provides a unit conversion for older projects. If the unit defined in the measuring unit conversion of a variable is changed by the report function in Runtime, you must carry out the configuration in the measuring unit conversion again.

3. Units detail view of toolbar and context menu

CONTEXT MENU UNITS DETAIL VIEW

Menu item	Action
New base unit	Creates a new base unit.
Export XML all	Exports all entries as an XML file.
Import XML	Imports measuring units from an XML file.
Help	Opens online help.

CONTEXT MENU AND TOOL BAR BASE UNIT/CONVERSION UNIT

Menu item	Action
New base unit	Creates a new base unit.
New conversion unit	Creates a new conversion unit for the superordinate base unit.
Linked elements: **Jump back to starting element**	Drop-down list with link back to the element from which you can reach the measuring unit. Only available if the unit is linked to another element.
Rename	Makes it possible to rename the unit. Attention: If units are renamed, all measuring units that are already linked to variables or used in functions must then have the respective variable or function amended manually. See also: Allocate a base unit to a variable (on page 9) Measuring Unit conversion function (on page 10).
Export XML all	Exports all entries as an XML file.
Import XML	Imports measuring units from an XML file.
Copy	Copies the selected entries to the clipboard.
Paste	Pastes the content from the clipboard. If an entry with the same name already exists, the content is pasted as "Copy of".
Delete	Deletes selected entries.
Help	Opens online help.

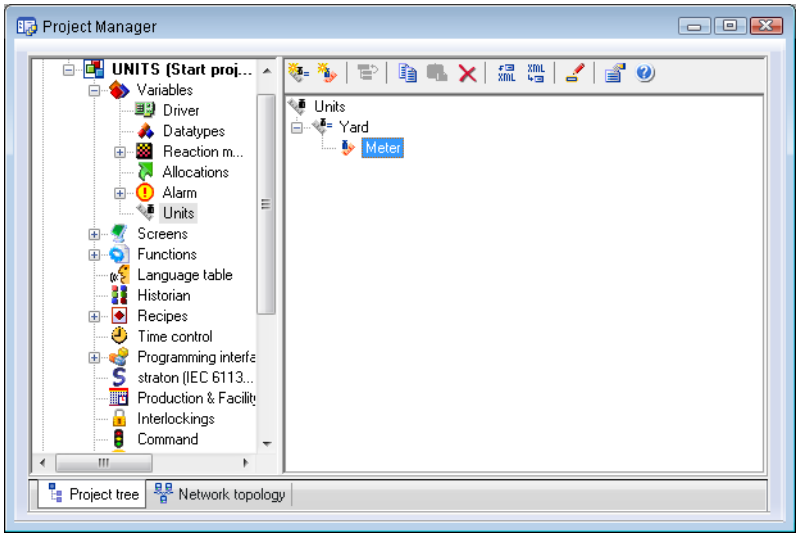
4. Engineer measuring units

You must create a base unit and a conversion unit for the conversion, as well as defining the parameters for conversion. The conversion is carried out using the formula y=kx+d (Austria) or y=mx+b (Germany). Each base unit can be allocated to a variable (on page 9) as a measuring unit.

TO CREATE A NEW BASE UNIT:

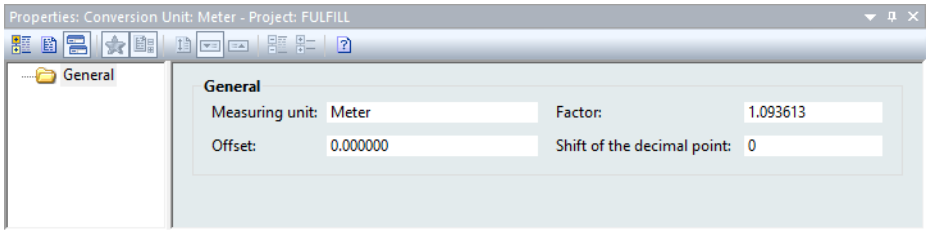
- select the measuring units node in Project Manager
- right-click on measuring units
- select the New base unit command from the context menu

- a new entry is created in the list
- give the measuring unit a name
- create the conversion unit



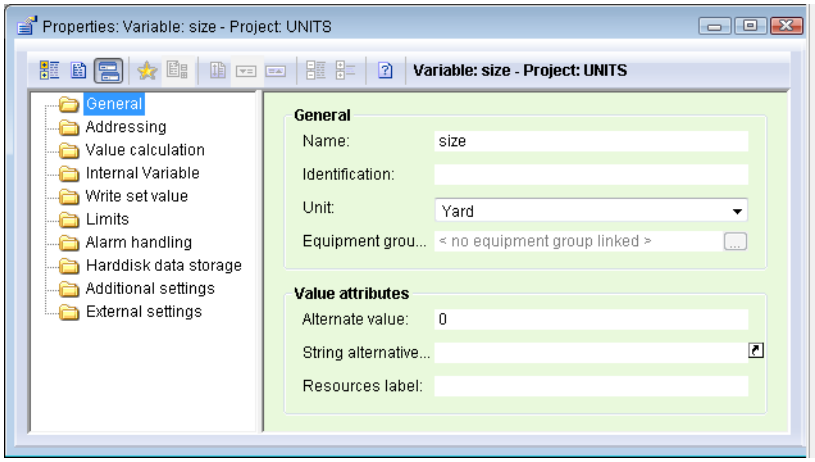
TO CREATE A NEW CONVERSION UNIT:

- right-click on a base unit
- select the Conversion unit command from the context menu
- a new entry is created in the list
- give the measuring unit a name
- define a **Factor** for the conversion
- define a value for the **Shift of the decimal point**
- define a value for the **Offset**



5. Allocate a base unit to a variable

Base units are allocated to a variable in the **Measuring unit** property (**General** node).



You are free to name units as you wish here. If the measuring unit conversion is used during runtime, select a pre-defined basis unit from the drop-down list.

Hint: If you give it a name of your choice, it is best to create a link with the same name straight away in Node units - the basic unit (on page 7).

You must create a Unit conversion function (on page 10) in order to be able to convert during runtime.

Attention

If a measuring unit is subsequently renamed, variables already linked to this are not automatically renamed.

To rename measuring units already linked:

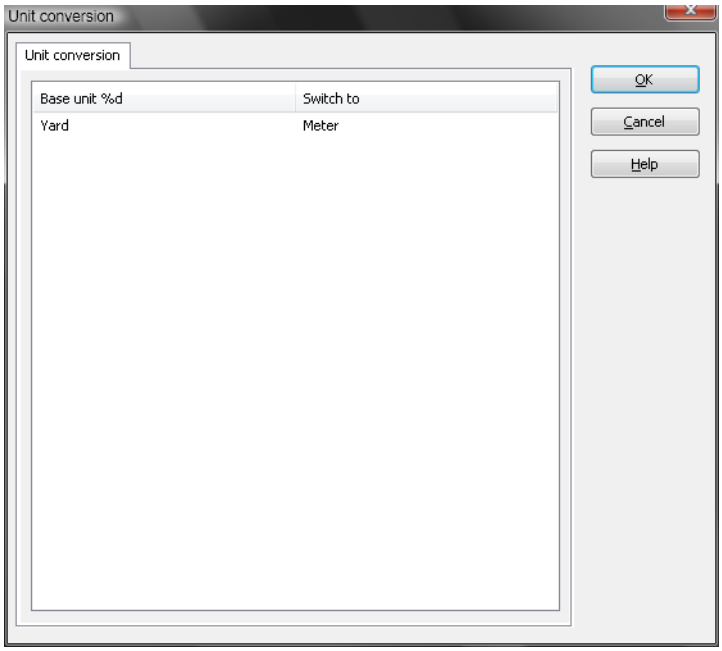
- select detail view in Project Manager
- select the measuring units column or add this to the view if it is still displayed
- in the context menu, select the Text command in Replace selected column
- In the opening dialog, search by name and replace it with the new name

6. Function measuring unit conversion

In order to carry out measuring unit conversion in the Runtime, create function unit conversion:

- select the Functions node in Project Manager
- in the context menu, select the command New function...
- navigate to the variable
- Select the measuring unit conversion function

  Note: The execution of function Unit conversion triggers a refresh of the report if it is displayed at the moment.
- The dialog for the definition of the measuring unit conversion opens.



Property	Description
Unit conversion	Dialog for the allocation of conversion units to basic units.
Base unit	List of the created basic units.
Switch to	Drop-down list for the selection of the conversion unit. You can either select a conversion unit or the basic unit. Engineered conversion unit: In the Runtime the basic unit is converted to the conversion unit. <Base unit>: The basic unit is still active in the Runtime.

Information

The units are not exported with the XML export of this function. You must export the units separately.

Attention

If a measuring unit is renamed afterwards, the renamed basic unit is automatically taken into consideration in the function. However you must change the conversion units manually.

7. Runtime

Each variable value for each input or output in addition to those used as standard when converting signal units to measuring range units is converted in runtime.

- Output: A conversion unit for a variable is activated with the Unit switch function (on page 10). The value in measuring units is subject to the pre-defined offset and factor. In addition, to convert the value into a string, the number of decimals set for a variable is corrected accordingly.
- Input The conversion is carried out along the lines of output in the other direction.

LIMITATIONS:

- At the export the new units are exported.
- Values that are saved as a string are not recalculated for output. These values remain in the measuring unit that was active at the time of creating the string. This particularly affects all values inserted into the text of a CEL entry, such as "Set value changed from OLD to NEW" etc.
- Operating hours and operations counters in Industrial Maintenance Manager are always displayed in base units here.
- Outputs in the EMS screen are always displayed in the base unit.

VBA

Values above VBA are always accessed in base units. For example, `Variable.Value` does not provide a value with units switched, because it is not a value output. 4 new functions have been incorporated into `Variable.` so that unit switching can also be used above VBA:

Keyword	Description
`SecondaryUnitName`	gives the name of the conversion unit set
`SecondaryUnitDigits`	gives the decimals for the conversion unit set
`CalcSecondaryUnitValue`	converts the value of the **base unit** into the value of the **conversion unit**
`CalcPrimaryUnitValue`	converts the value of the **conversion unit** into the value of the **base unit**