PROCON-WEB

Documentation

07. January 2022

Content

1. General information

1.1. Notes on this software

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However, we ask you not to share copies of this product with anyone else, as we have spent a lot of time, effort, and money to provide you with this software.

We strive to provide you with valuable products of the highest quality. If you have any questions about our software, or suggestions for additional programs that we could develop for you, please contact us:

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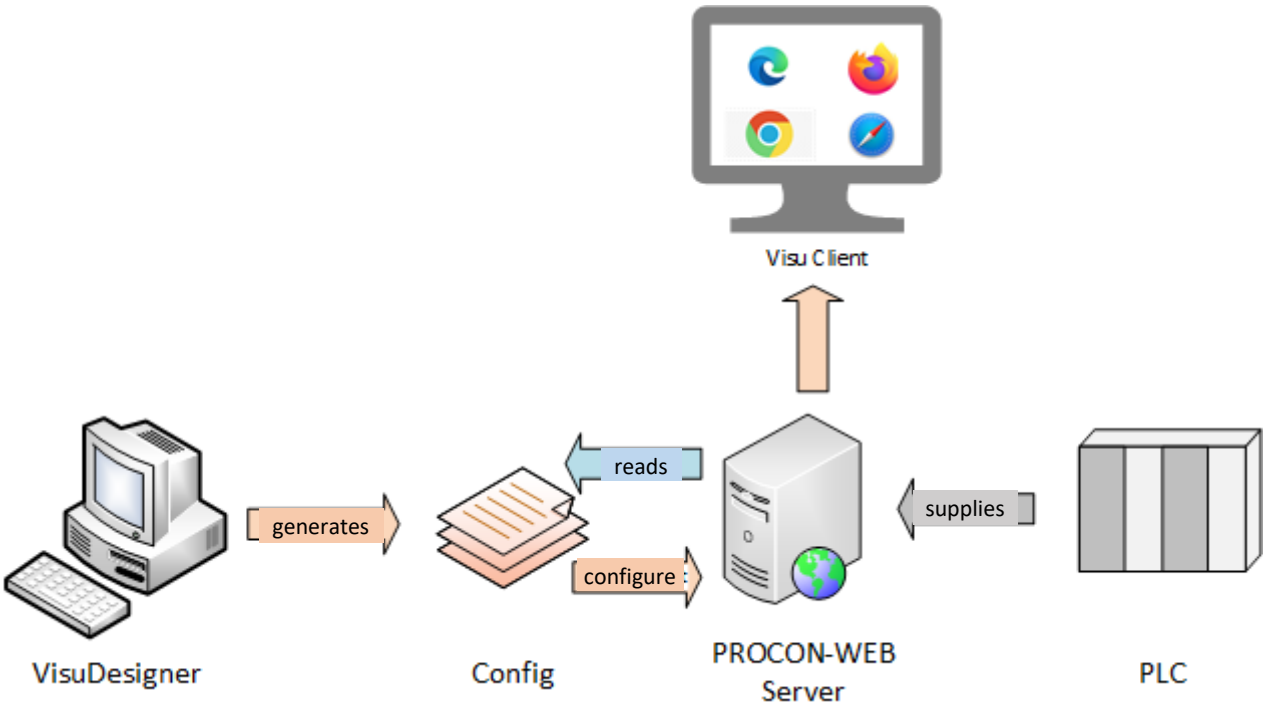
2. Overview PROCON-WEB

2.1. What is PROCON-WEB?

PROCON-WEB offers you the possibility to implement HMI/SCADA projects web-enabled and thus platform-independent. You have the possibility to configure various media such as PC, tablet, smartphone, etc. differently in one project. PROCON-WEB thus supports the use of Adaptive Design. The component that has remained largely the same is the Designer (see Chapter 3). This has retained its structure, but the range of functions has been extended. The structure of a PROCON-WEB system is as follows:



(1) System overview PROCON-WEB

In this overview, all components of PROCON-WEB from the Designer to the server can be recognized. At the beginning of a development process is always the Designer. Here, the project is individually designed and implemented. After the configuration phase is completed, the project is created. The Designer creates the required configuration and HTML files for the runtime based on the project file.

The server interprets these files to access the desired PLC-Variables (via communication drivers) and creates the web-based HMIs to the connected Clients. PROCON-WEB allows the communication with several established PLCs such as Siemens, Beckhoff and Rockwell) and via open communication protocols, like OPC-UA, ModBus etc.

The VisuClient on which the runtime is displayed can be any device on which a modern HTML5-compatible Internet browser is installed.

2.2. Scalability and Platform

An essential unique selling point of PROCON-WEB is the broad scalability of the system from simple HMI applications to complex SCADA solutions. The optimal platforms can be used for this. PROCON-WEB runs on inexpensive embedded systems as well as on powerful virtualized and highly available servers.

Scalability is limited on the one hand by the license, on the other hand also by the hardware used. Basically, the following aspects can be scaled:

- Number of usable tags (data points used in the project)
- Number of clients (here we distinguish between full-fledged clients and clients that can display a maximum of 5 pictures (e.g., smartphone interface)
- In addition to the number of pieces, scaling is decisive for determining an appropriate license price, which also considers the total price of the customer product (device or machine or plant).

PROCON-WEB has a very wide scalability and can run on different platforms. The following table shows the range of systems available today.

Cloudanbindung

Variant	PROCON-WEB SCADA	PROCON-WEB EMBEDDED SYSTEMS
Designer	Designer (all targets)	Designer (embedded Target)
Operating system	Windows 10 Server 2016/2019	Docker Container or Native for Windows, Linux
Hardware	According to the operating system requirement with x86 architecture	According to the operating system requirement ARM32 or AMD64
Functionality	HMI, User, Alarming, Logging, Data management, Reports, Skripting, OPC-UA-Server, Diagnosis	HMI, Users, Alarming, Logging, Data management, Skripting, OPC-UA-DA-Client
Used cases	**Demanding HMI applications for complex machines or large control system applications with up to 100 clients and comprehensivedata processing**	**User interfaces for machine controls and building automation or IOT applications for machine data acquisition with cloud connection**

2.3. Uniform Project Planning

The same Designer is always used for all applications. By license information, he receives the activation of different targets. All project information is stored in the same format, making it easy to use applications on other targets. Thus, simple surfaces on embedded targets can be transferred directly to the higher-level SCADA system or the same basic application can be used for simple and complex machines.

2.4. Schematic structure of the PROCON-WEB server

The PROCON-WEB server carries out the data exchange with the control system(s) (the process) and is responsible for the central management of data (recipes, logs, ...). It serves the clients with the data necessary for the picture structure, but without knowing the pictures or their contents.

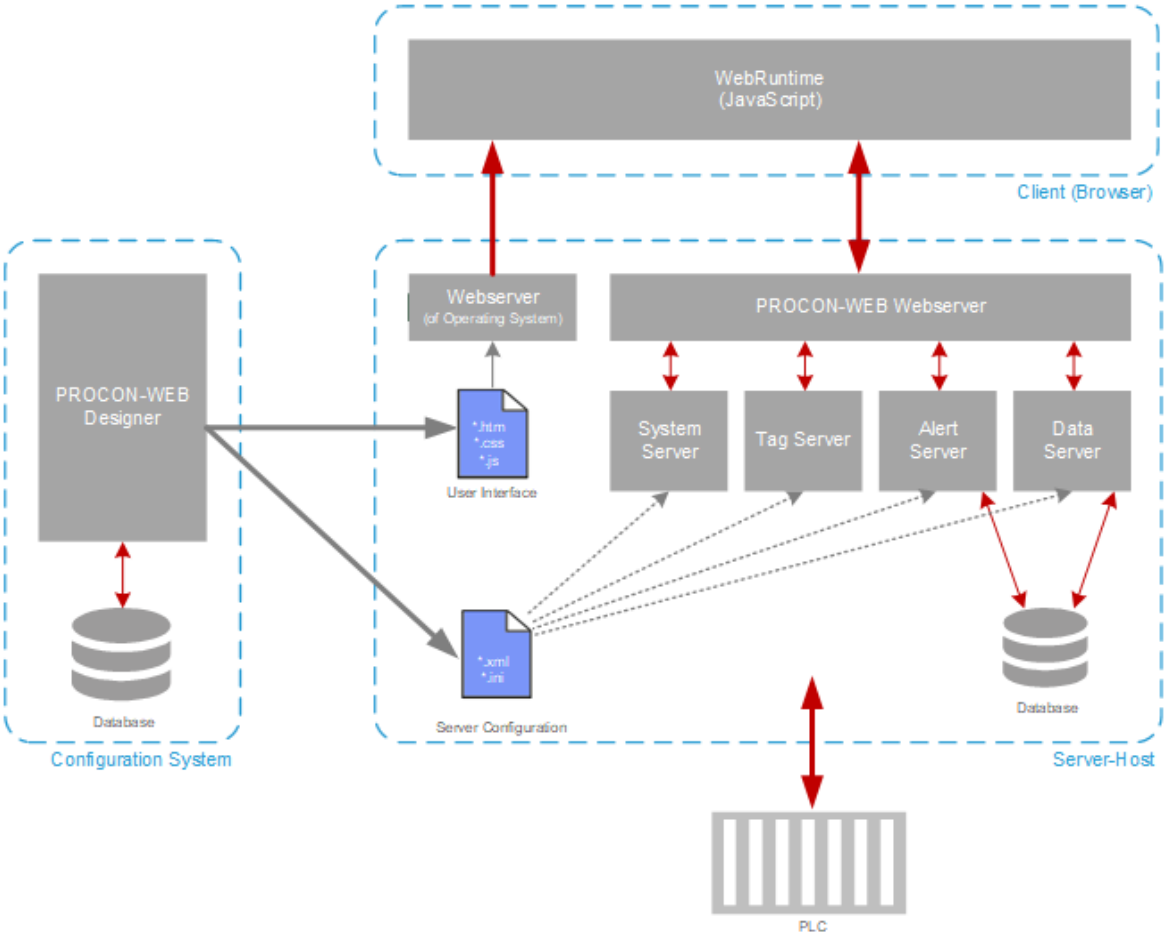


Fig. 2 System setup of PROCON-WEB with Designer, Server and Client

The Designer generates picture data as web files and transfers it to the web server for delivery to the client. Additional configuration files are intended to describe the tasks of the various server modules (services). Each module is responsible for a different task and the specific constellation of modules (services) can be adapted to specific applications.

For PROCON-WEB EMBEDDED SYSTEMS there is a simple installation guide. Depending on the target system, services are executed in a combined form as a single process.

2.5. Versions of the target in the Designer

The PROCON-WEB Designer uses MS SQL database.
Depending on the currently selected target (either SCADA or Embedded System) , the user interface in the Designer is reduced to the respective usable functions. This has effects in the object tree, but also in the concrete function assignment for a control.

For embedded devices, different user interfaces for project transfer can be displayed that consider the functions of the target.

2.6. Web browser (VisuClient)

Fig. 3 Different device classes

The Designer can create an application for different devices. These devices are divided into different device classes such as tablets or smartphones. Three devices as potential clients are predefined. A default class, a class for tablet and a class for smartphones. Further classes can be added individually according to the desired device. HTML pages are generated for each device that has been considered in the configuration. Depending on the device, these pages are then shown appropriately and displayed in the browser.

To call up a project in runtime, a URL must be entered into the browser that has the following structure:

http://IP-of-the-server:Port-of-the-web server/

EXAMPLE

http://192.168.0.100:16700/

3. Basic Working with PROCON-WEB

This quick guide gives you a step-by-step introduction to project generation with PROCON-WEB. The full range of functions of PROCON-WEB is not discussed. Through the step-by-step processing, a complete PROCON-WEB project with a number field object and a button can be generated.

3.1. Typical approach when starting a project

For the creation of an HMI project, we recommend the procedure described below, depending on the project.

1. Create a concept
2. Setting the basic configuration
3. Define user roles and rights (at least one right per user role)
4. Define communication with the process or PLCs and define tags as database of the project
5. Configure picture class(es) to match the desired representations
6. Check and adjust styles for the required controls
7. Create Control classes for the typical display elements
8. Create or import graphics
9. Merge pictures from the local library, the self-created control classes and link them to the tags already created
10. Link pictures with each other via buttons
11. Optionally create scripts

For the first project, a simple picture with the representation of 1-2 process values as a number field should be configured and started as a test. This would have checked the communication to the I/O or the PLC and carried out the basic workaround once.

Experience has shown that various questions about different functions arise during picture creation. With the very comprehensive manual of the PROCON-WEB Designer, which is also available as PDF and online manual, many of these questions can be clarified. In addition, Weidmüller GTI Software GmbH offers training courses and workshops, which also include topics of customer-specific adaptations and extensions.

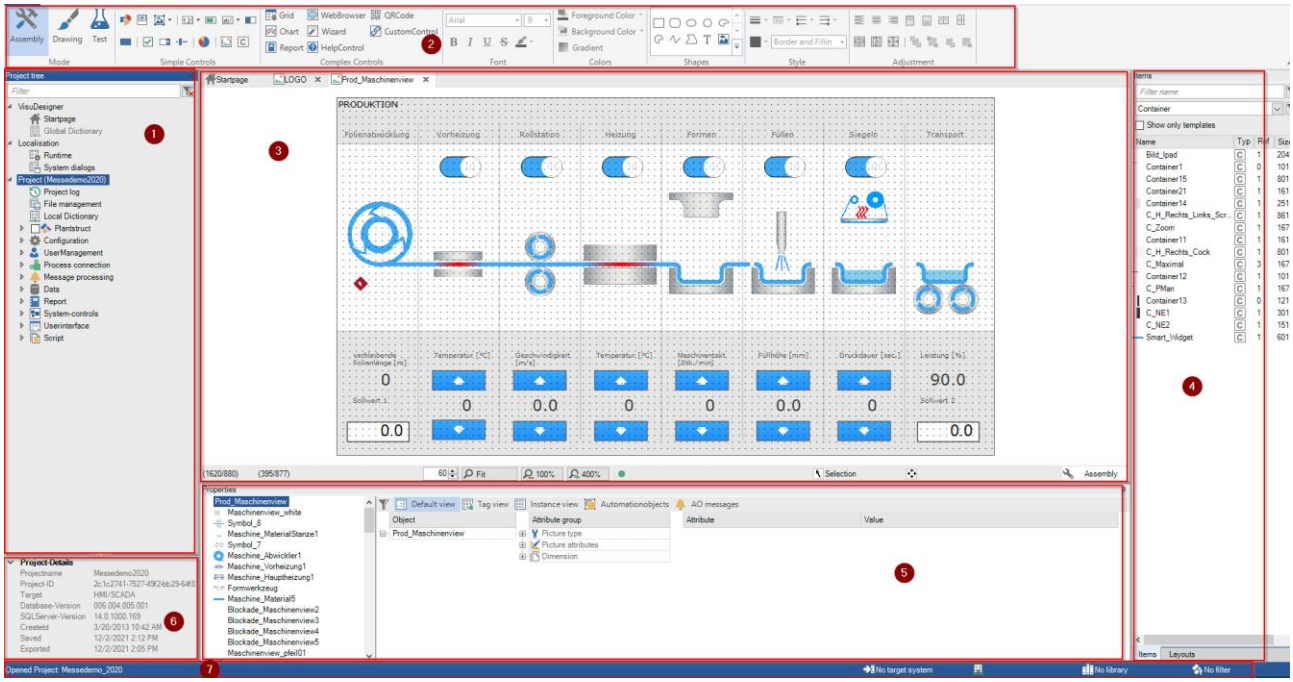
3.2. Class-Instance-Concept

The class-instance concept in PROCON-WEB is based on object-oriented programming. Classes are defined from which the instances later inherit. PROCON-WEB distinguishes between class and instance values. If a change is made in a class, this has an impact on the instances formed by it. As soon as instance values are changed, the remaining instances of the same class remain unaffected.

EXAMPLE

You create a button. For this purpose, a class is first defined in PROCON-WEB. This class contains basic characteristics of this button (colour, functions, ...).
After the class is created, an instance of that class is inserted into the picture. This instance, in turn, can extend or replace the characteristics of the class.

3.3. Structure of the Designer



The designer is seperated in different departments. The ribbon control bar (1) on top, the project tree (2) on the left side. Below the informations (6) about the project and tags. On the ride side there is the overview of the elements (4). Underneath the panel is the workspace (3) and the attribute area (5). In the footer (7) the project name and target system can be found

3.4. Control panel with Ribbons

A ribbon control bar for calling the functions is integrated in PROCON-WEB.

3.5. Function and structure of the Ribbon-Control panel

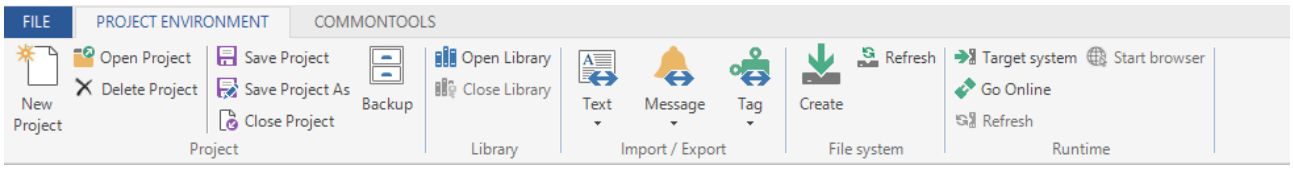


Fig. 4 Ribbon Control Panel

In the header area of the window there is a Quick Access toolbar, which includes frequently used functions and tools such as the functions "Save Project", "Close Project", "Print", "Undo" and "Redo".

Below the Quick Access toolbar are ribbon tabs, in which the various ribbon groups are present. The tools are listed in these. Depending on the currently engineered part of the project context-related ribbon tabs are displayed.

Ribbon tab File

Under the backstage area in the File tab, you will find general functions for project management, help, printing, and the options. The options are discussed in more detail in the chapter "Options in the Designer".

Ribbon tab Project Environment

The following chapter shows the ribbon groups and tools that are available under Project Environment.

Ribbon tab Standard Tools

The Default Tools ribbon tab contains the Insert, Cut, Duplicate, Undo, Redo, Find, Replace, Print, and Print Preview tools. In addition, the language selection and the filter for the plant structure are in this tab.

Ribbon Tab Tag

The "Tag" ribbon tab is available when the operator is in the process variables or .dem structure editor.

Ribbon tab Alarm Tools

The Alarm ribbon tab is available when the operator is in the Message Processing Editor.

Ribbon tab Data Tools

The ribbon tab "Data" is available when the operator is in the PlugIn Data. In the Ribbon tab Data, the displayed tools are analogous to those in "Tag" and "Message".

Ribbon tab Picture Tools

The "Picture Editing" ribbon tab is available when the operator is in the picture editor.

Ribbon tab Script Tools

The Script Tools ribbon tab is available when the operator is in the picture editor.

Quick Access Toolbar

The toolbar can be used to quickly access frequently used tools.

This allows you to work faster and more efficiently, as you do not have to jump back and forth between the individual tabs.

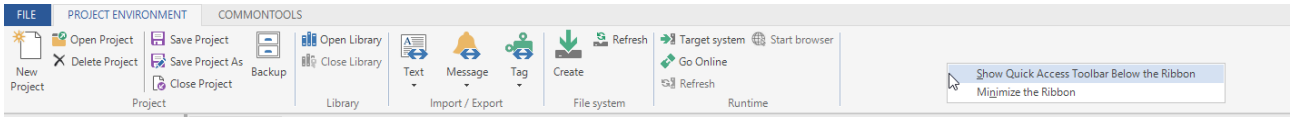


Fig. 5 Enable the Quick Access Bar

The bar can be arranged below the ribbon. If it is hidden, you will find it in the upper left corner of the GTI logo. If you want to add another function, right-click to press the corresponding symbol. A dialogue opens with the field "Add to Quick Access Toolbar".

Now the icon appears in the Quick Access Toolbar.

3.6. Options in the Designer

The specific settings for the Designer are made in the options. The "Options" dialogue is opened by the "File" > "Options" entry.

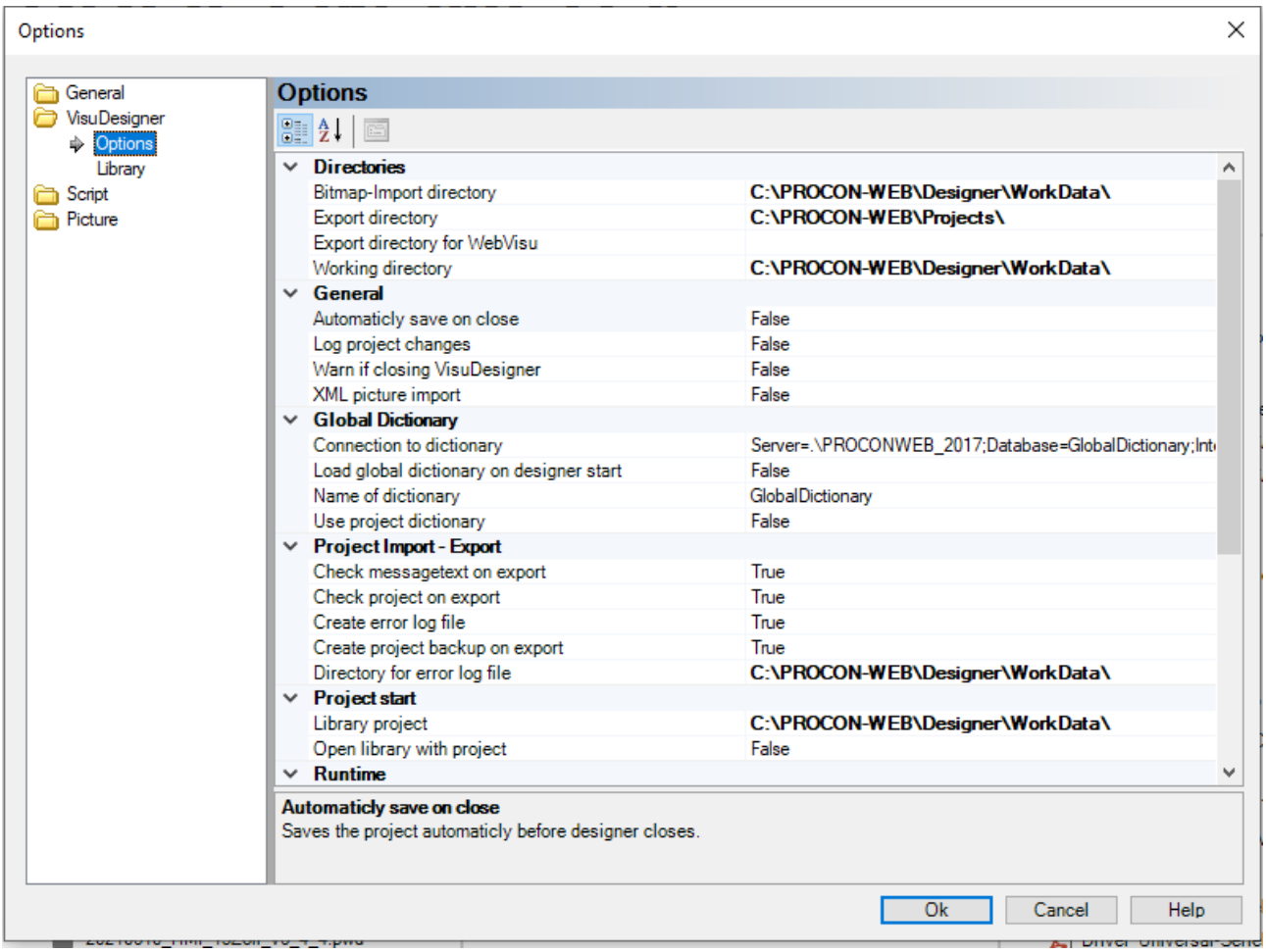


Fig. 6 Options for the Designer

3.7. Structure and Handling

The PROCON-WEB Designer works with the "multi-Window" technique. The user interface is divided into four windows: the Project Tree, the Workspace, the Toolbox, and the properties window. The following paragraphs explain each window in more detail.

The Project Tree

All editor plug-ins can be opened via the project tree. By default, the project tree is located on the left side of the interface but can also be hidden.

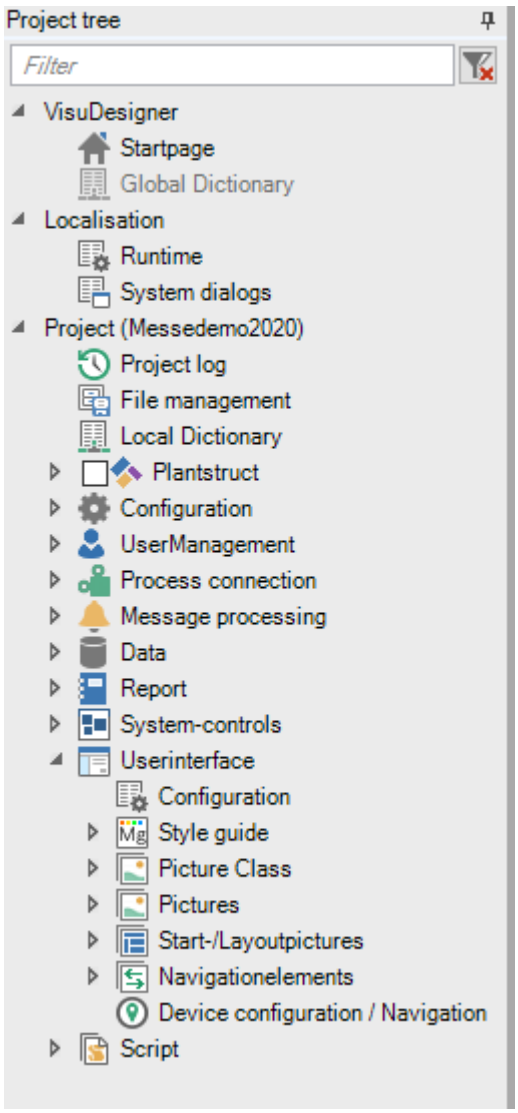


Fig. 7 The project tree

In addition to the editors, information about the currently open project is also available via the project tree. To do this, "Project" must be selected in the project tree. Below the window, a small overview with the project information is displayed.

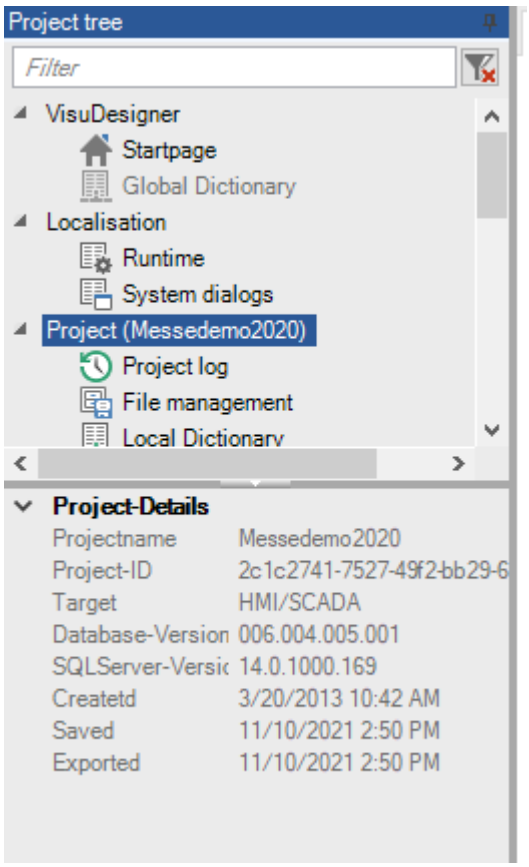


Fig. 8 Project information

The Workspace

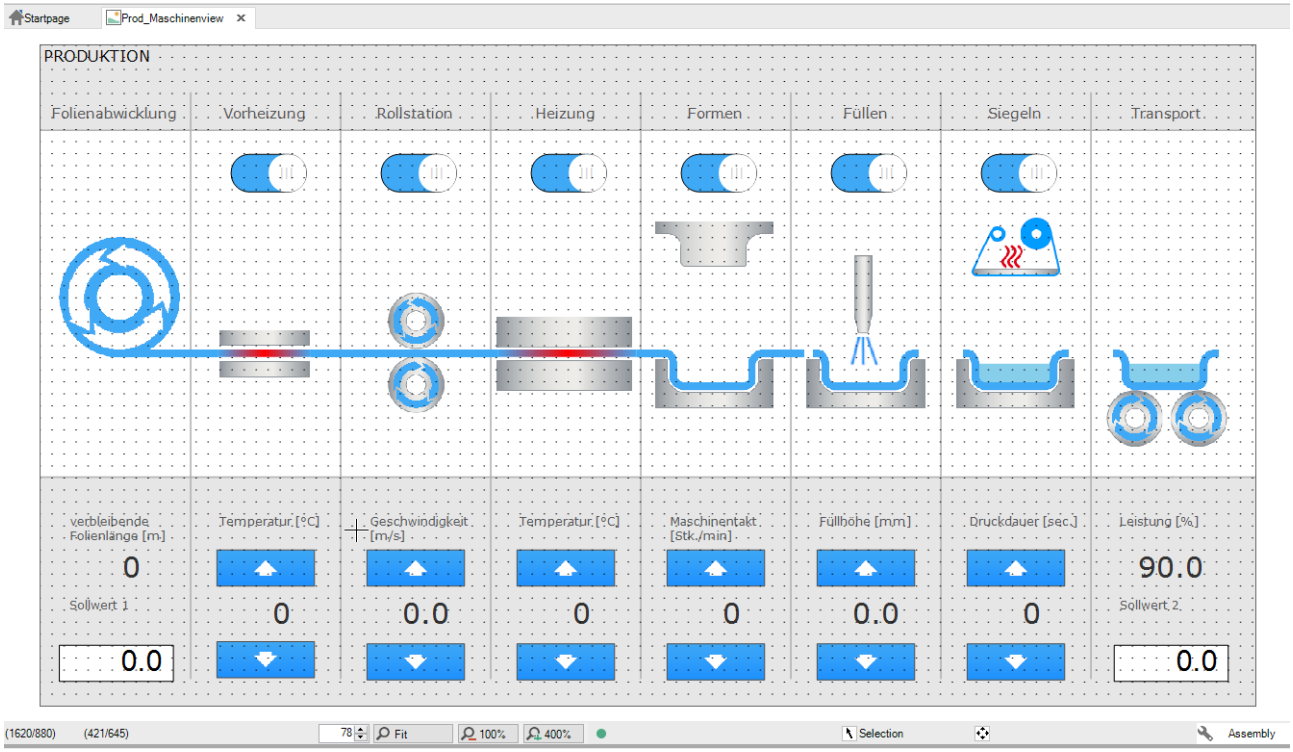


Fig. 9 The workspace

Depending on the open plug-in, the project changes are made in the work area. In picture montage, for example, symbols are drawn and placed in the workspace, variables are created in the process variable editor, etc. In addition, you can switch to already opened editors via the tabs.

The Toolbox

Several functions are available in the Toolbox. On the one hand, the Toolbox lists all static and dynamic symbols that have already been created, which are inserted into the picture via "Drag'N'Drop". Names and type filters are available in the toolbox, allowing the user to filter out all currently irrelevant classes and thus find the required elements faster and integrate them into the picture.

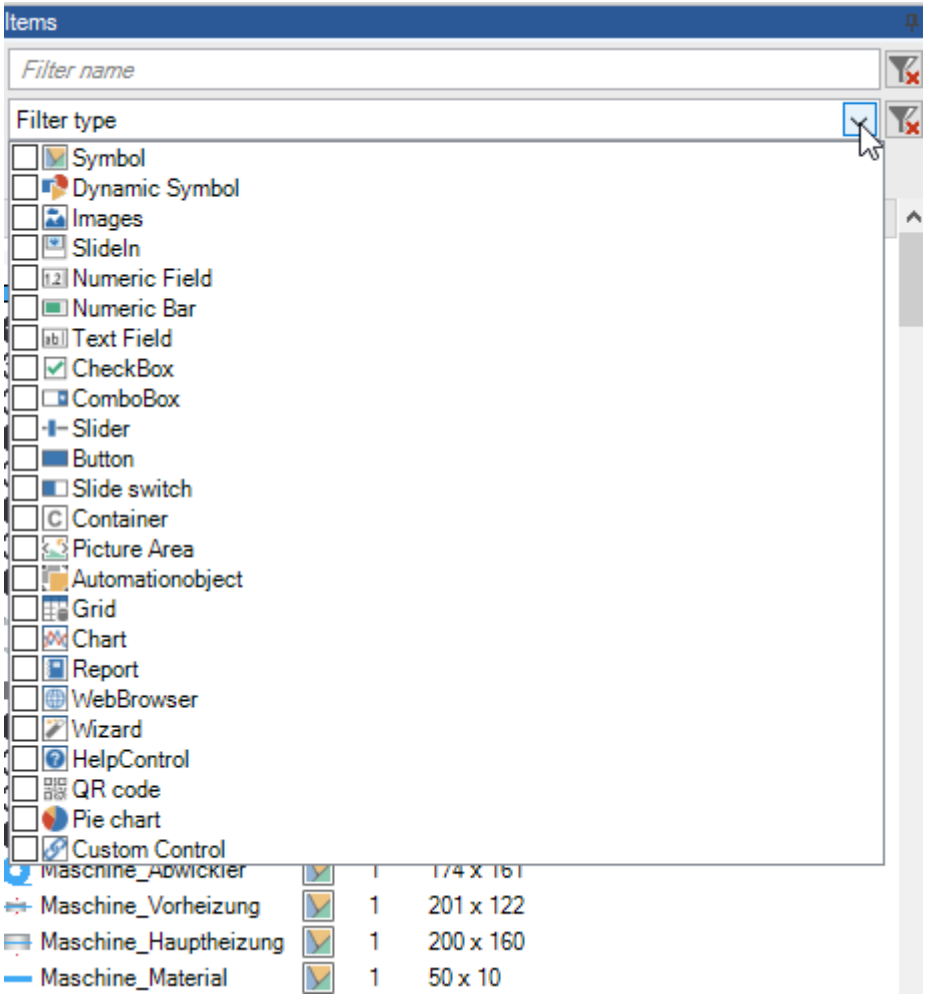


Fig. 10 Toolbox

The Properties window

The properties window displays the attributes of the selected symbols. The picture attributes can also be configured in this window.

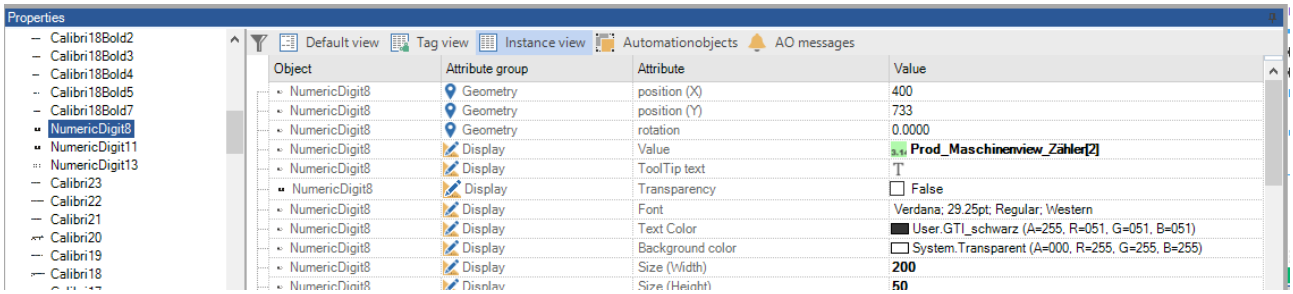


Fig. 11 Properties window

For more efficient configuration, the views "Standard", "Process Variables", "Instance Values" and "Automation Objects" are available to the user.

The Default view displays all configuration parameters of the picture or icons.

Under Process Variables, the system pre-filters the view to display only properties whose parameters require process variable input.

The Instance Values view, like the Default view, shows all available properties. The difference is in the arrangement of the parameters. In the Instance Values view, all properties are displayed one below the other. In addition, multiple changes are possible in this view.

In addition to displaying the instance values for the automation objects, an extended assignment is also offered under "Automation Objects". Further information can be found in the chapter on automation objects.

Filter and sort functions

PROCON-WEB provides the user with filter options in order not to lose track of large projects and to quickly find the desired data.

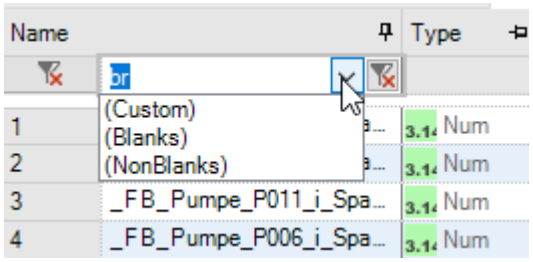


Fig. 12 Filter

In addition to the filter functions, sorting can also be carried out by clicking on the column with the left mouse button. The columns are then sorted in ascending or descending order by the system. After the third click on the column, the system automatically removes the sorting.

INFORMATION

When the "SHIFT" key is held, a sorting by several columns can be performed.

The display can be converted from the list structure to a tree structure via the grouping field by dragging the columns by which to group into the grouping field.

HINT

After the editor is closed, the grouping is discarded.

3.8. Project Backup

3.9. How Project Backup Works

Saves the currently open project under a different name (Automatically generated). The project is compressed and stored in the "backup directory" as a ZIP file. The backup directory is automatically created under the work order (WorkData) of the Designer.

INFORMATION

Format of the automatically generated name: Projectname_ddmmyy_hhmmss

3.10. Usage of the Backup

Via the "Project Environment" area, the project backup can be triggered via the Safe Button, which is labeled "Backup". In the status bar, the name of the last backup can be read in blue.

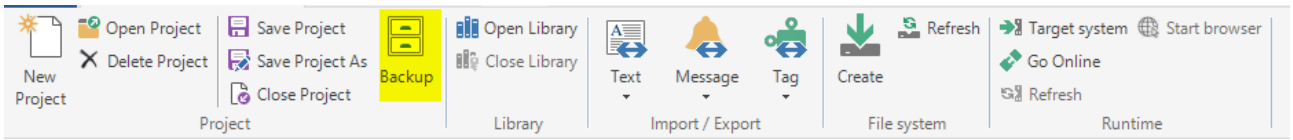


Fig. 13 Backup

HINT

If you press the button quickly, errors may occur because the SQL server is still busy with the previous backup.

3.11. Keyboard Shortcuts

In PROCON-WEB some functions can also be executed with keyboard shortcuts. the following table provides an overview of the functions that can be performed with keyboard shortcuts.

Area	Shortcut	Function
General	F1	Help
	Strg+S	Save Project
	Strg+Shift+S	Save Project as
	Strg+Shift+F2	Create runtime environment
	F5	Go Online
	Strg+F2	Update
	Strg+F5	Start Viewer
	Strg+P	Print
	Strg+Shift+P	Print preview
	Strg+C	Copy
	Strg+V	Paste
	Strg+X	Cut
	Strg+D	Duplicate
	Strg+Z	Reverse
	Strg+Y	Restore
	Strg+A	Mark All
	Strg+F	Search
	Strg+H	Find and replace
	Strg+F4	Close the current tab in the workspace
	Strg	Multiple selection
	Del	Delete

	Shortcut	Function
Picture	Shift+- o. ¯ o. ¬ o. ®	Move picture elements pixel by pixel
	Strg+- o. ¯ o. ¬ o. ®	Move picture elements in a 10x grid
	W+ Selection	Single selection of grouped elements
	Strg+ W+ Selection left mouse	Multiple selection of grouped elements
	Shift+ Selection left mouse	Assignment of process variables for AO instance values with structure assignment
	Shift+ Selection left mouse	Switching the selection of symbols when lying on top of each other
	A+ Selection left mouse	Selection of objects at the edge of the object by several layers. If several symbols are on top of each other, the objects below the top level can be selected through them with the A key held and the left mouse button.
	Tastenkombination	**Funktion**
Tables	„First Cell“ + Shift+ „Last Cell“	Selection of several consecutive cells or Lines
	Tab	Jump to the next column
	F4	Open Combobox
	Shortcut	**Function**
Script	Strg+G	Go to Row
	Strg+ E	Line break
	Strg+Alt+ ®	Indent
	Strg+Alt+ ¬	Move out
	F2	Compile

3.12. How you create a new project

- In the menu item "File" or in the ribbon "Project environment" select the item "New project"
- Specify project name
- Optionally specify file names
- Leave the target system on "HMI/SCADA" (here are further targets for SAE-IT FW5, IoT and ResMa Connect)

All PROCON WEB functions are now available in the project tree.

3.13. Adjust the project

To create and start a simple project, a few settings must be made on the project configuration:

- Call up the network configuration via the project tree via "Configuration" à "Network"
- In the left table under "Count of non-dedicated participants" enter at least one to be able to start the project when no one is logged on

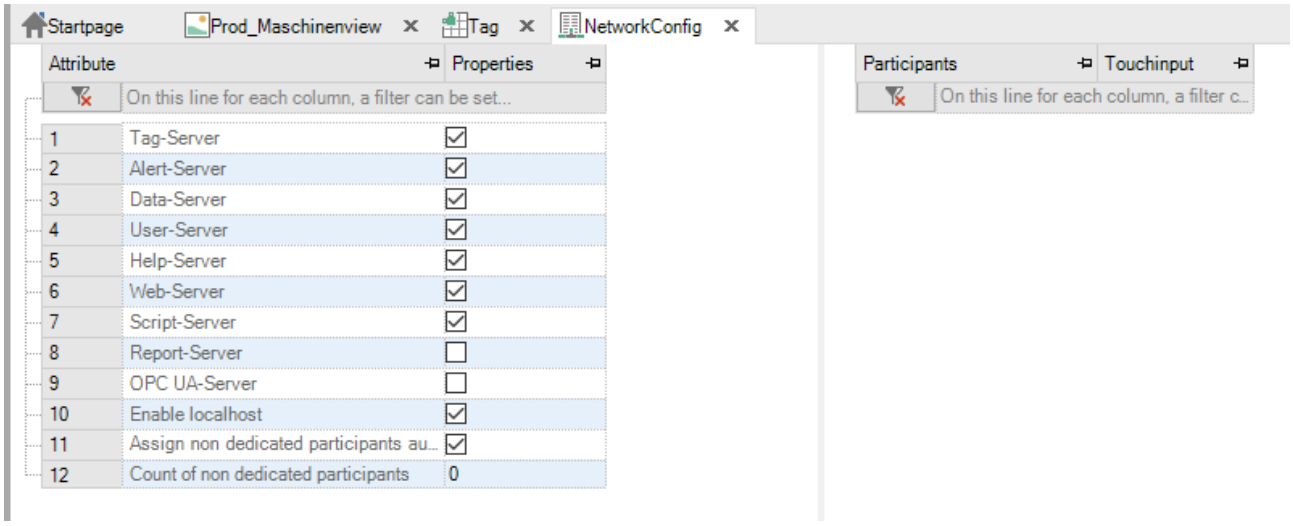


Fig. 14 Network configuration

Depending on the PROCON WEB server used, the settings may differ. No network configuration must be carried out for the target 'IoT' for example.

4. User management

4.1. General

With the user management editor, the required users and policies can already be defined in the design phase. During runtime, these users can be changed, or new users can be created. The creation of user groups and the assignment of rights to the user group are not possible at runtime.

To individualize the appearance of the dialogues for user administration at runtime, they can be customized via the style guide (see chapter "Styleguide").

4.2. User

The User editor is used to create or edit the users needed at run time.

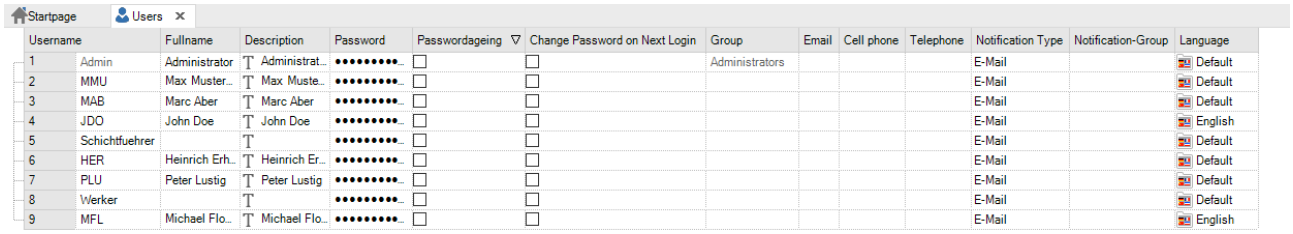


Fig. 15 User-Editor

The user "admin" cannot be deleted and is used to administer the system. With it, other groups and users can be modified, which is why it should only be used as a fallback if e.g. no one can log in anymore.

To create new users, the context menu is opened, and the entry Create or copy user is selected if an existing user is selected.

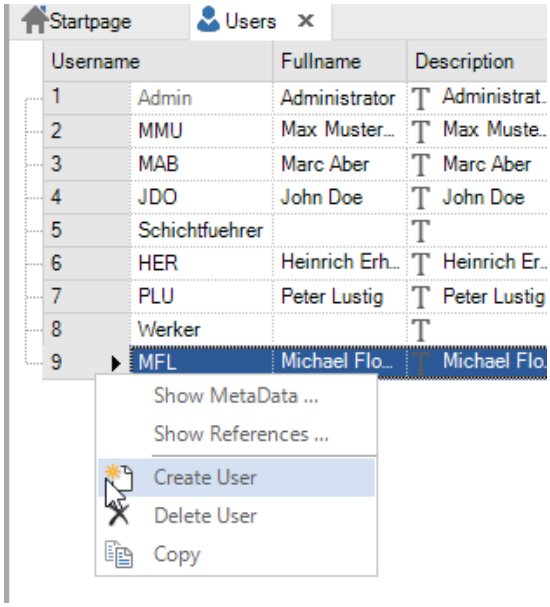


Fig. 16 Create new users

Alternatively, an empty user is created to which attributes must be assigned.

4.3. Guidelines

Under this point, all settings regarding password security are adjusted. By default, all password policies are enabled or set with default values.

To achieve FDA compliance of the user administration, restrictive settings for the user administration must be made accordingly (see whitepaper FDA conformity). Passwords are stored encrypted in all cases and cannot be read.

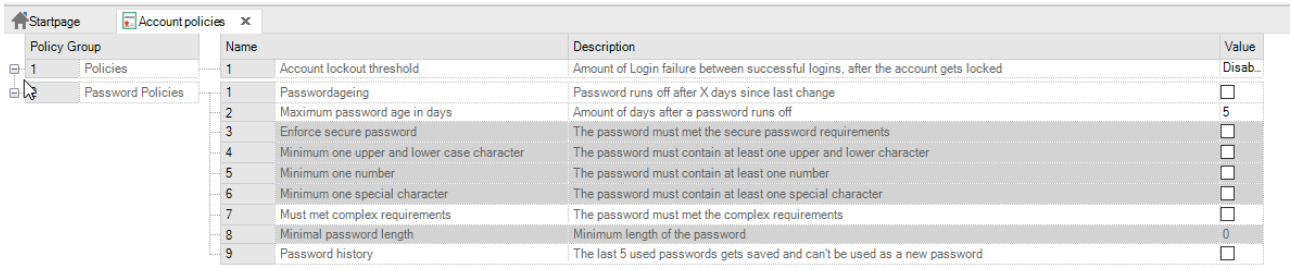


Fig. 17 Policies

4.4. Roles and Rights

This editor is divided into two parts. In the upper part you will find the possibility to create a new group.

In the lower section you can define new task/rights groups.

4.5. Roles/Groups

In this area, new groups are created, existing ones are edited, or certain ones are deleted. There is also the possibility to copy an existing group. By default, the "Administrators" group is predefined, which cannot be deleted. Others can be created via the context menu.

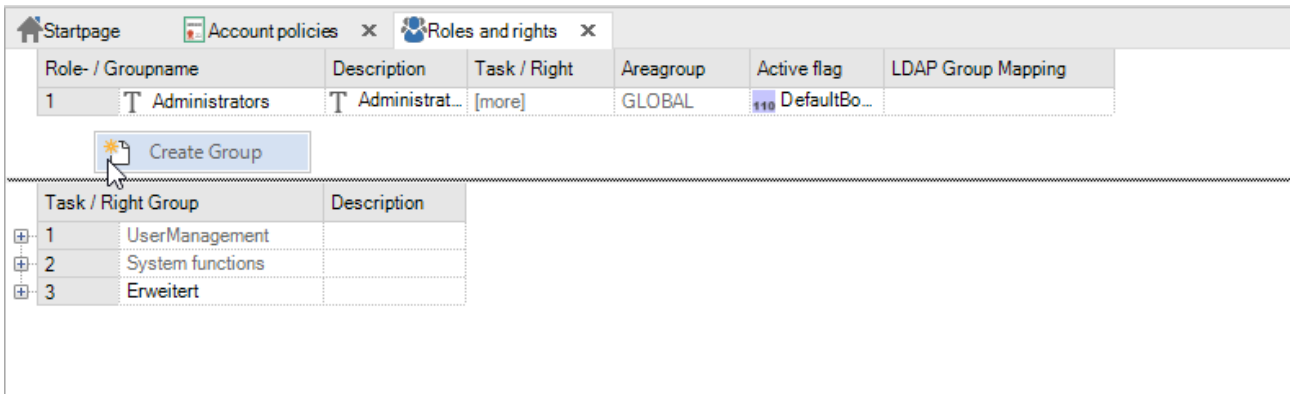


Fig. 18 Create a new user group

After the group is created, rights can be assigned to the group.

The rights column displays the name of the right. If more than one right has been assigned to the group, "[more]" is displayed. The button opens a dialogue above which the rights can be selected.

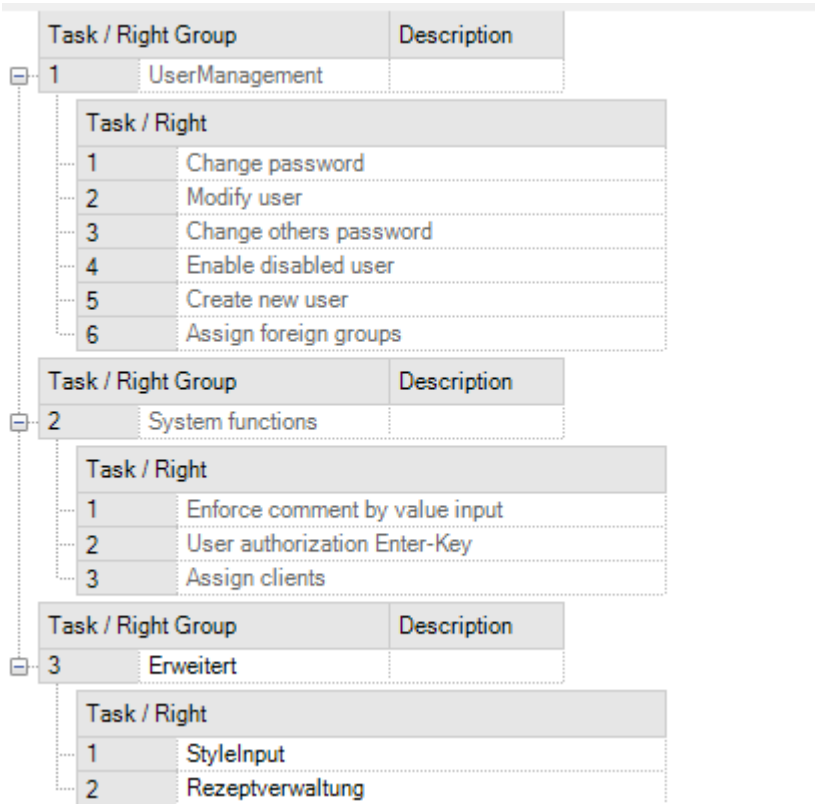


Fig. 19 Assignment of rights for user groups

All available rights are listed and grouped by rights group in this dialogue. The right can be assigned to the group via the column "Assigned". If "Right denied" is activated, the user group does not have access to the right.

The changes are applied when clicking on the OK button, discarded when clicking on the cancel button.

4.6. Tasks/Rights

In the "Tasks/Rights Group" area, the account and password policies can be configured.

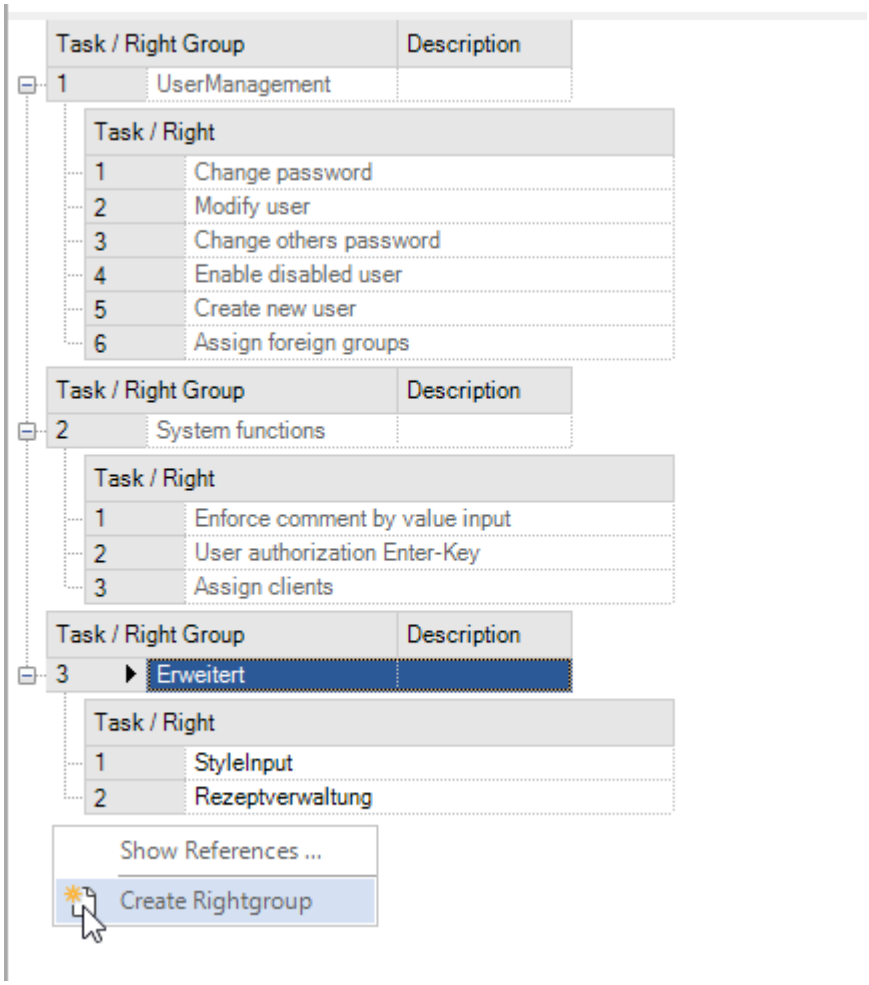


Fig. 20 Create a new rights group

An empty rights group is created to which various user-specific rights can be assigned.

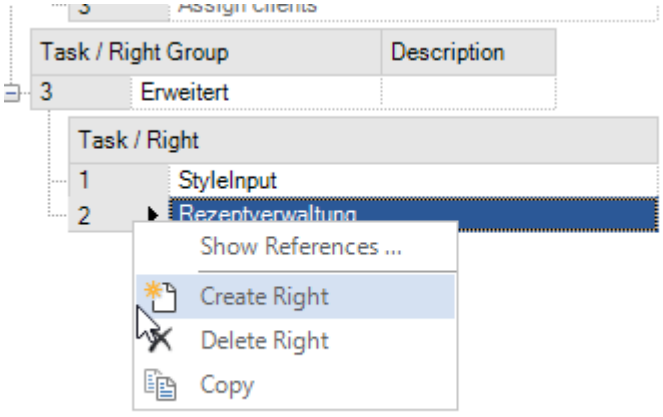


Fig. 21 Create a new right for a user group

A right is created that can later be added to an icon or picture.

5. Process coupling

5.1. General

The Process Coupling component is used to configure the database and communicate it with the control system. At runtime, this is done via the TagServer which has different plug-ins for communication via different protocols. Up to eight different driver plug-ins can be used for a project.

The drivers implemented in the plug-ins sometimes require specific equipment (fieldbus plug-in cards, COM interfaces, ...) and are not available for all server variants, because these plug-ins are very operating system specific.

There are three different variable types in PROCON-WEB:

Logical process variables	Numeric process variables	Text variables
		
Condition 0 or 1	Numbers (internal as Float)	Strings

All process variables are designated with a symbolic name, which is then known within the pictures, formulas, or other components of PROCON-WEB These definitions are part of the project data and are used by all function groups of PROCON-WEB

All program-internal data accesses are realized via the symbolic name (or index, assigned by the system). Only during communication with the process the driver assignment and the driver-specific information evaluated. PROCON-WEB therefore is a PLC independent HMI and SCADA system.

The data exchange from the runtime system to the process takes place via the controller-specific driver. If problems occur during communication with the controller (e.g., cable not plugged, data not available, protocol errors, ...), these are reported and displayed as system messages by the runtime system. Each driver requires specific parameterizations and settings to establish communication. This information is listed in the Driver's Guide and must be considered during installation.

5.2. Units

In the tree of the PROCON-WEB-Designer there is aentry "Units" under "Process coupling". Here the units for numerical process variables can be defined.

Units are now divided into a "basic" and "conversion unit". As previously known, the "basic unit" can be provided with a name, the display unit, and a description. A "basic unit" can have several "conversion units". These include the display unit, a conversion formula, and a description

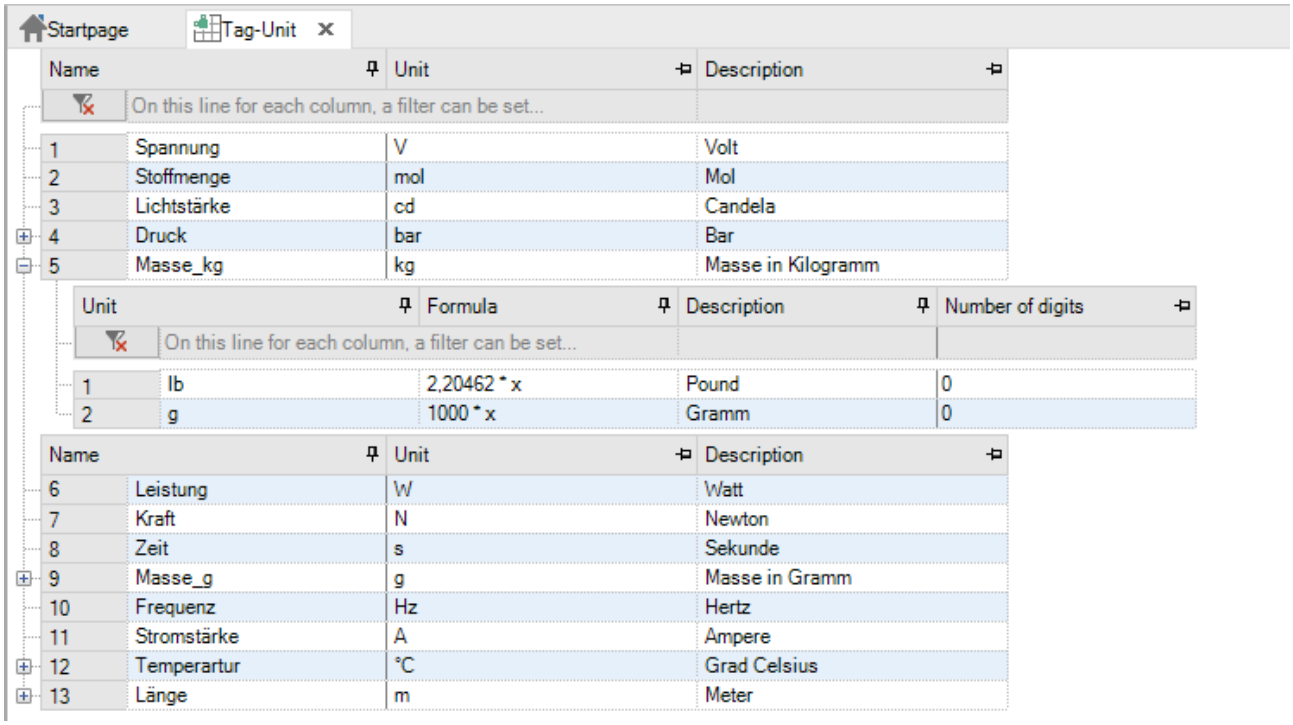


Fig. 22 Overview of the units

This makes it possible to define country-specific units, which are also taken into account during language switching.

HINT

Currently, only a language switch is carried out and no unit conversion! The texts themselves can no longer be configured in multiple languages!

Units are defined in a grid like almost every element in PROCON-WEB.

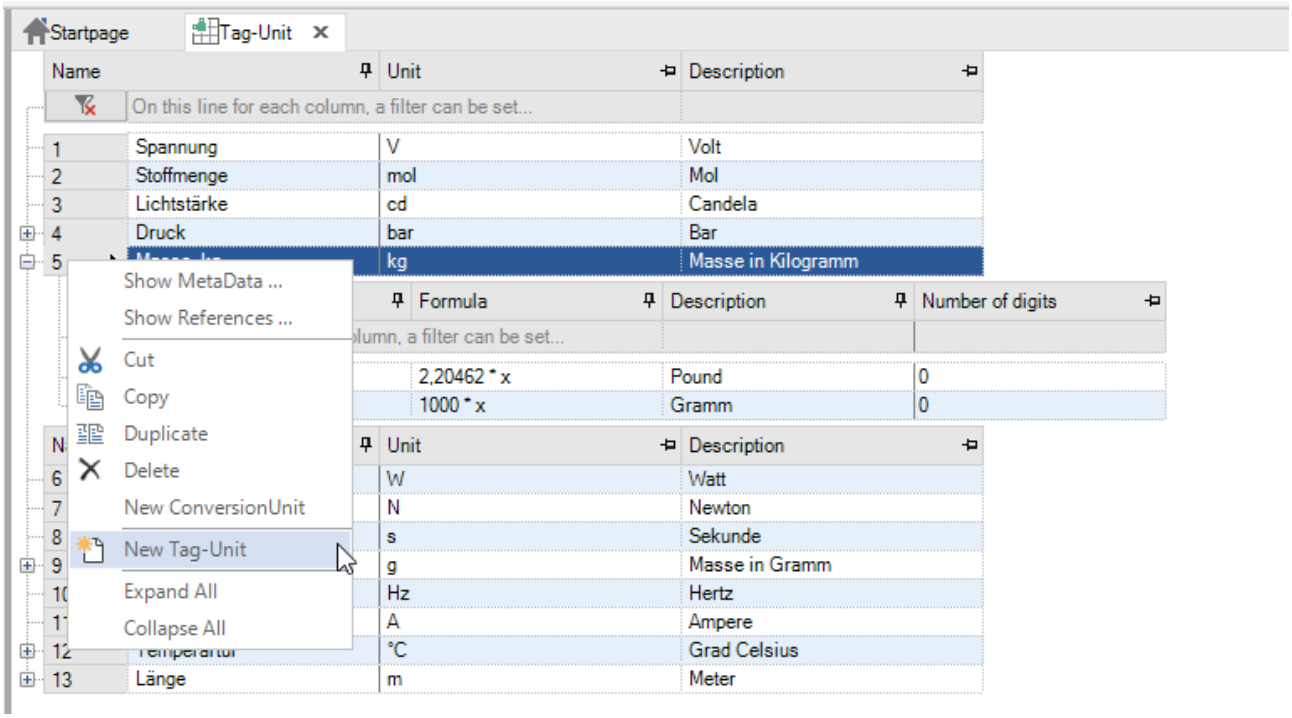


Fig. 23 Creating Units

The picture shows a "basic unit" (Masse_kg) and two "conversion units".

The formula is used to calculate the value for the display when a unit is switched. In the formula, the 'x' stands for the underlying asset. Operations '+','-','/','*' are allowed; furthermore, parentheses can be set. Other characters are not allowed.

By right-clicking "New conversion unit", further conversion units with the respective conversion formulas as well as the translation of the unit and a description can be entered.

A so-called unit set contains the "mapping" from "conversion unit" to "base unit". Speak with which formula the value is later calculated during the switchover and which unit is displayed in the display. With the mappings you can only add a "basic unit" with a "conversion unit" once.

Language

A unit set can be assigned to a language. In the case of a language change at runtime, the units defined in the set are thus switched / converted

System variable

There is a system variable "__System_CurrentUnitSet" through which you can perform a unit switch.

Chooser

A function "Open Unit Selection Dialogue" can be placed on controls like buttons for example. At runtime, after pressing the button, a selection dialogue of the possible unit sets for switching is displayed.

Decimal place shift

Numerical values between -10 and 10 can be inserted. The entered value indicates by how many decimal places the converted unit should be moved. note that the value you enter is not the new number of decimal places but moves the default value.

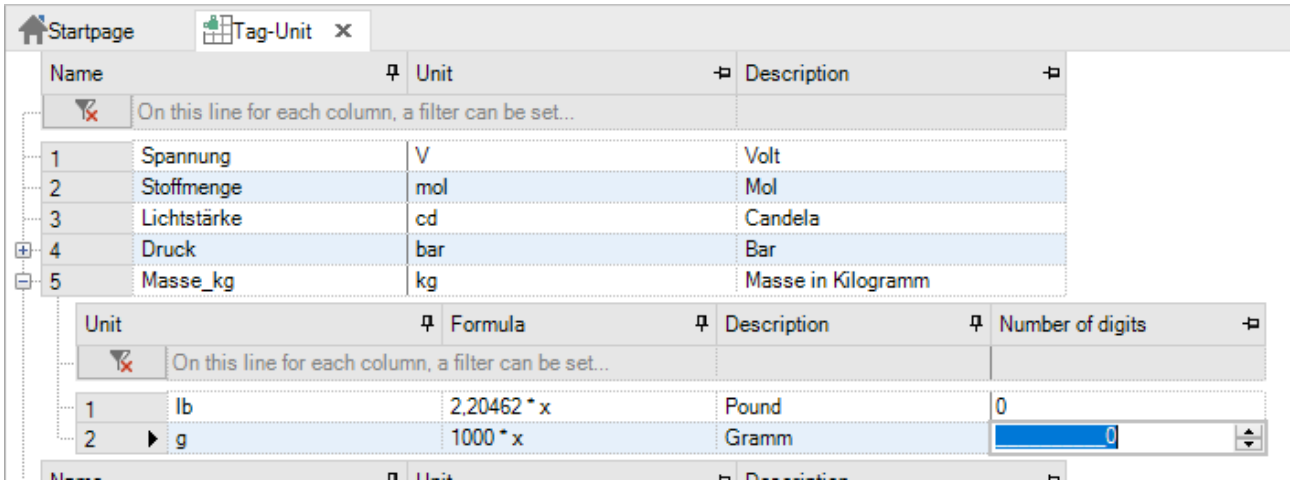


Fig. 24 Decimal place shift

5.3. Process variables

5.4. How to define communication

- Open the "Process Coupling" branch in the Designer's project tree
- Then call the "Process Variables" editor
- The process variable list appears in the workspace

Here process variables can be created, the communication driver can be selected and configured.

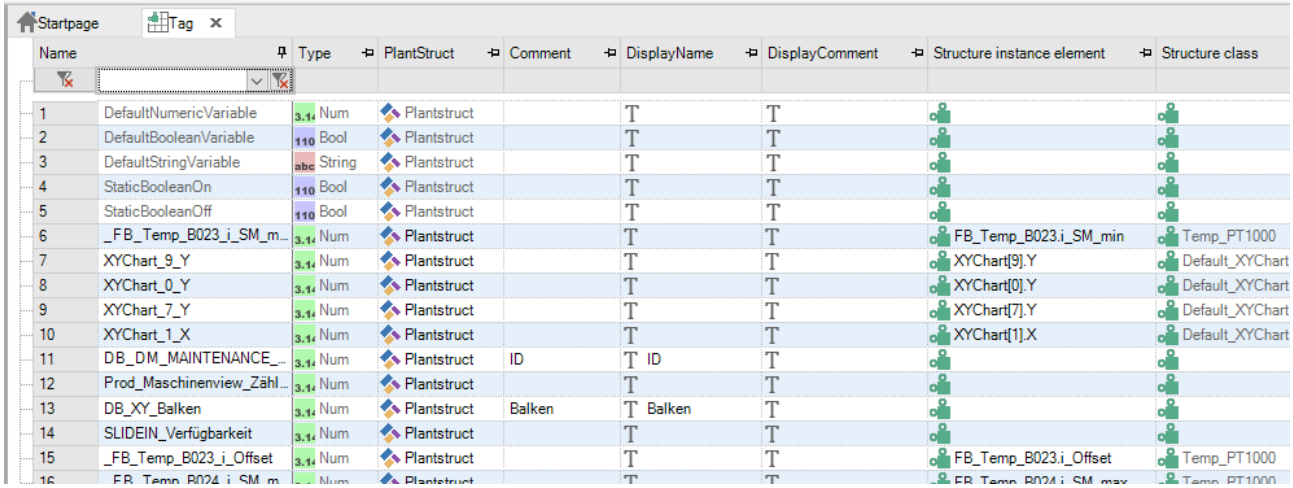


Fig. 25 Editor for process variables

5.5. How to define a process value with coupling

- In the process variable editor, right-click in the workspace and select the entry "Num" in the context menu via "Create process variable"
- Enter "NumVar01" as the process variable name in the "Name" field
- Select a driver in the driver column via the combo box

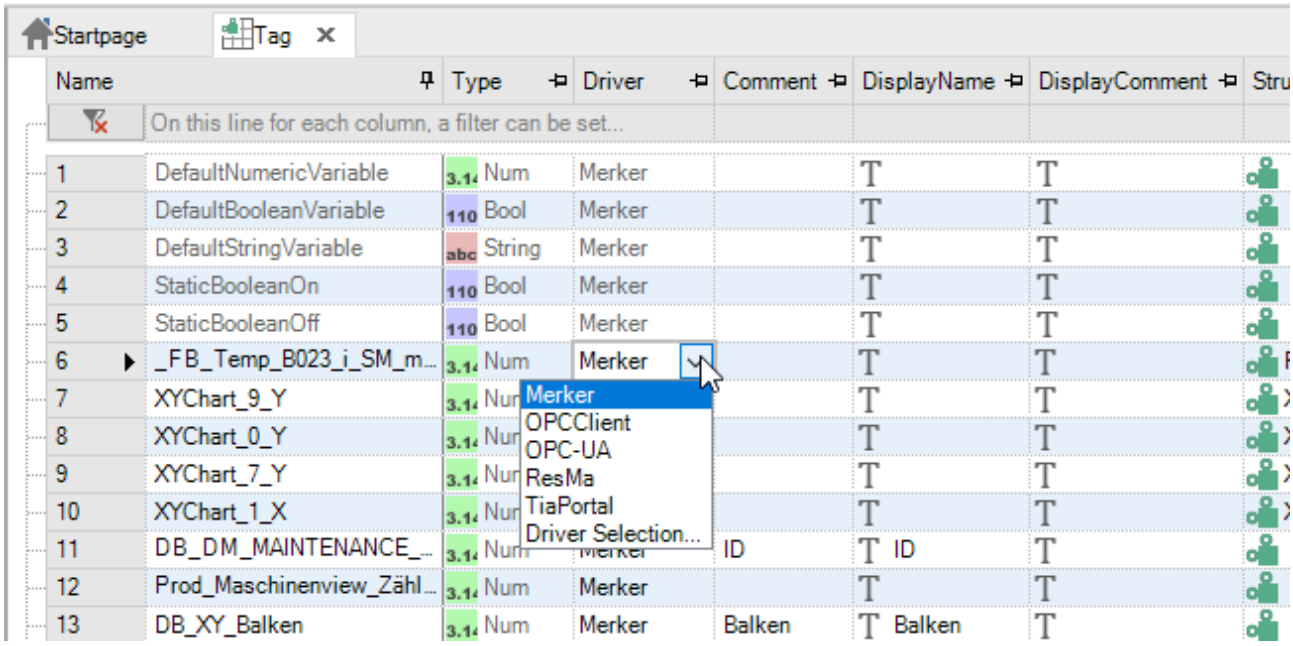


Fig. 26 Assign drivers to process variables

Process variable still needs to be adjusted in the value range, access type, addressing and format.

HINTS

The detailed parameterization of the communication driver via the driver configuration file is described in the corresponding driver manuals. The driver configuration file can be opened and edited by selecting the INI file column in the driver selection dialogue

INFORMATION

To be able to test the project without communication later, it is recommended to activate the test driver in the driver configuration file (see driver manual).

Close the Process Variable Editor with the right mouse button on the "Process Variables" tab à"Close"

Tag value ranges

Two value ranges must be defined for each process variable in PROCON-WEB These are important on the one hand for the display or use of the process variables in the interface, on the other hand for communication with the PLC.

Due to different values of Min/MaxPC and Min/MaxSPS, a standardization can also be mapped.

Definition via Min/MaxPC and Min/MaxSPS

The value range of a process variable can be defined in the PROCON-WEB process variable editor.

By defining the parameters accordingly, a standardization can be configured.

If no standardization is desired, the columns "MinSPS" and "MaxSPS" can also be hidden for better clarity.

Export and import of process variables

In addition to editing the process variables in the Designer, the user has access to the variable import or export to an Excel table. the exported file format is an xml file that can already be accessed from within the Designer.

HINT

If an XML file created by the export is edited with Excel, make sure that if I want to delete the value in a cell, it must be replaced with a " "". Otherwise, it comes to the fact that the complete variable is deleted.

	type	id	Name	AccessLevel	FieldSize	Driver	DriverField0	DriverField1	DriverField2	DriverField3	DriverField4	IOType	BoolDefault	NumDefa
435	STRING	1b22fb51-	Auftragsname	0	1	Merker						Bidir		
436	STRING	19031436-	SiloNK3Bemerkung	0	1	Merker	0	0	0	0	0	Bidir		
437	STRING	c7c2fe8f-'	SiloNK11Inhalt	0	1	Merker	0	0	0	0	0	Bidir		
438	STRING	22ac3d0d	Ast_Text6	0	1	Merker						Bidir		
439	STRING	165397d0	SiloNK9Bemerkung	0	1	Merker	0	0	0	0	0	Bidir		
440	STRING	aef02d08-	Ast_Text5	0	1	Merker						Bidir		
441	STRING	539fc461-	Ast_MinDauerTxt	0	1	Merker						Bidir		
442	STRING	8e0758e0	Ast_Text1	0	1	Merker						Bidir		
443	STRING	eb9718b8	SiloHK1Bemerkung	0	1	Merker	0	0	0	0	0	Bidir		
444	STRING	15feb34f-	Artikelnummer	0	1	Merker						Bidir		
445	STRING	80942955-	SiloNK3Inhalt	0	1	Merker	0	0	0	0	0	Bidir		
446	STRING	31fe8aa8-	SiloNK7Bemerkung	0	1	Merker	0	0	0	0	0	Bidir		
447	STRING	897e54ed	SiloNK10Bemerkung	0	1	Merker	0	0	0	0	0	Bidir		
448	STRING	a70c9185-	SiloNK15Inhalt	0	1	Merker	0	0	0	0	0	Bidir		
449	STRING	51447ea9	SiloNK1Inhalt	0	1	Merker	0	0	0	0	0	Bidir		
450	STRING	fec85a19-	Auf_Artikel	0	1	Merker						Bidir		
451	STRING	a31c0c38-	Alarmtext2	0	1	Merker						Bidir		
452	STRING	e0b989e7	SiloHK2Bemerkung	0	1	Merker	0	0	0	0	0	Bidir		
453	STRING	34f43285-	Ast_MaxDauerTxt	0	1	Merker						Bidir		
454	STRING	3dbe26d2	Ast_Text4	0	1	Merker						Bidir		
455	STRING	688faf7c-'	SiloNK12Bemerkung	0	1	Merker	0	0	0	0	0	Bidir		
456	STRING	00c95546-	SiloHKInhalt	0	1	Merker						Bidir		

Fig. 27 Process variable export to Excel

HINT

Units are not created during the import process. If a unit does not exist in the project, no unit is assigned, but after the import information is displayed for which variable the unit could not be imported and what its name is.

5.6. External Coupling (Driver)

Driver coupling (SPS)

To be able to configure or establish a coupling with a PLC, the appropriate driver must first be selected in the Designer. Several drivers are integrated in PROCON-WEB to couple the most common systems.

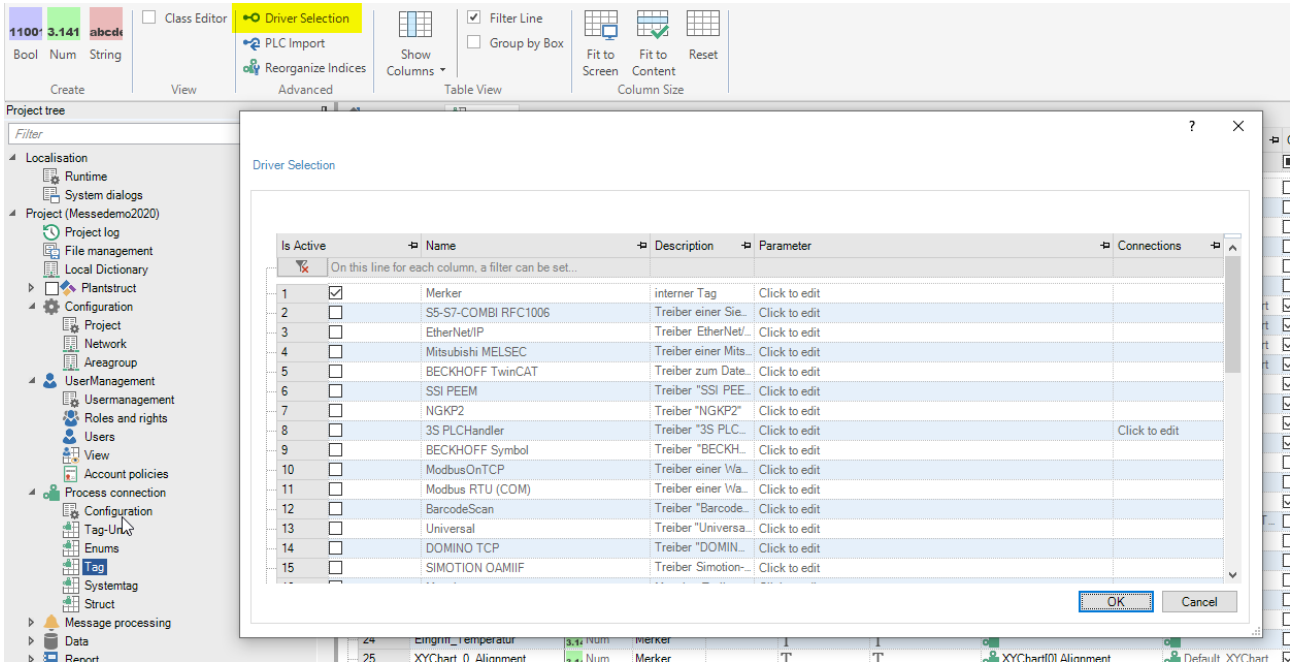


Fig. 28 Driver selection in the Designer

For the coupling to work, some of the drivers must be configured even further.

For older drivers, this is done by a driver's own ini file. This ini file can also be edited via the driver selection dialogue:

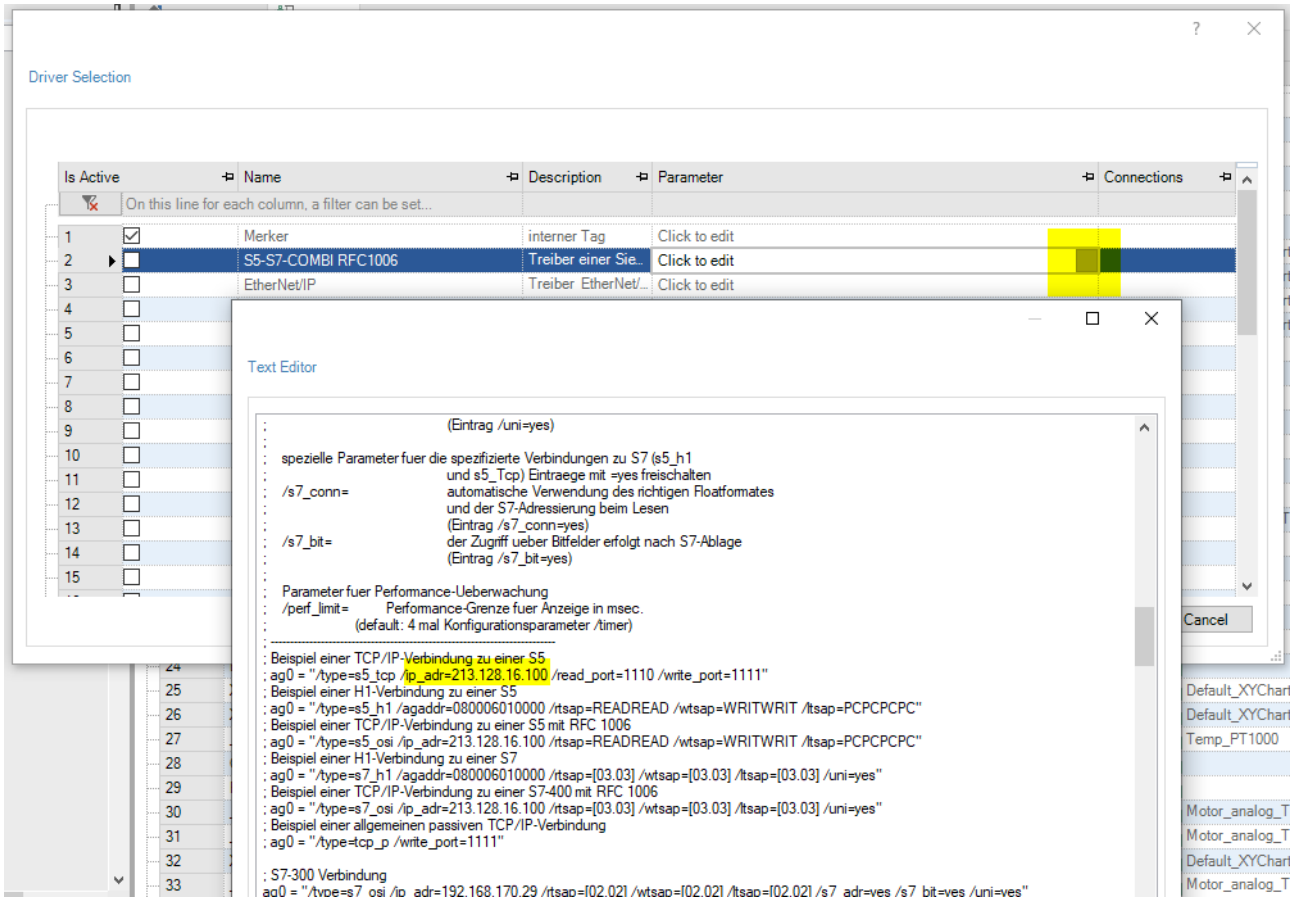


Fig. 29 Edit ini-file

For IP-based drivers, the address of the controller may have to be adjusted. For more information, please refer to the manual of the corresponding driver.

For some drivers, it is also possible to adopt the variable definition used on the controller directly into PROCON-WEB

For newer drivers, the configuration is better supported by a new driver interface.

5.7. PLC import

The PLC import is used to import the variable definition used on the controller directly into PROCON-WEB. Possible incorrect definitions or misconfigurations of the variables can thus be prevented. PLC import is only available for the most frequently used drivers. The following table lists the drivers that support driver-dependent variable import.

Driverdepending Import:	Driver:
OPC Items	OPC-Client
OPC-UA Items	OPC-UA-Client
WAGO-Modbus	ModbusOnTCP
Siemens S7	NetLink-MPI, Hilscher-MPI, S5/S7-Combi RFC1006
Siemens TIA-Portal	S5/S7-Combi RFC1006
3S CoDeSys	3S-ARTI
3S CoDeSys	3S-PLCHandler
Beckhoff TwinCAT	Beckhoff TwinCAT
Beckhoff Symbol	Beckhoff Symbol
EtherNet/IP	EtherNet/IP
SAIA-PCD	SAIA-PCD

The PLC Import ribbon tool in the Tag Tools opens the PLC Import tab.

HINT

Driver-dependent variable import is only possible if the appropriate driver is enabled in the driver selection.

The procedure for driver-dependent variable import is described here as an example for S5/S7 combi RFC1006. Import of variables of other PLC types can be found in the corresponding driver manual.

The S7 project from which the variables are to be imported is selected in the "Import Settings" window via the "Add" button.

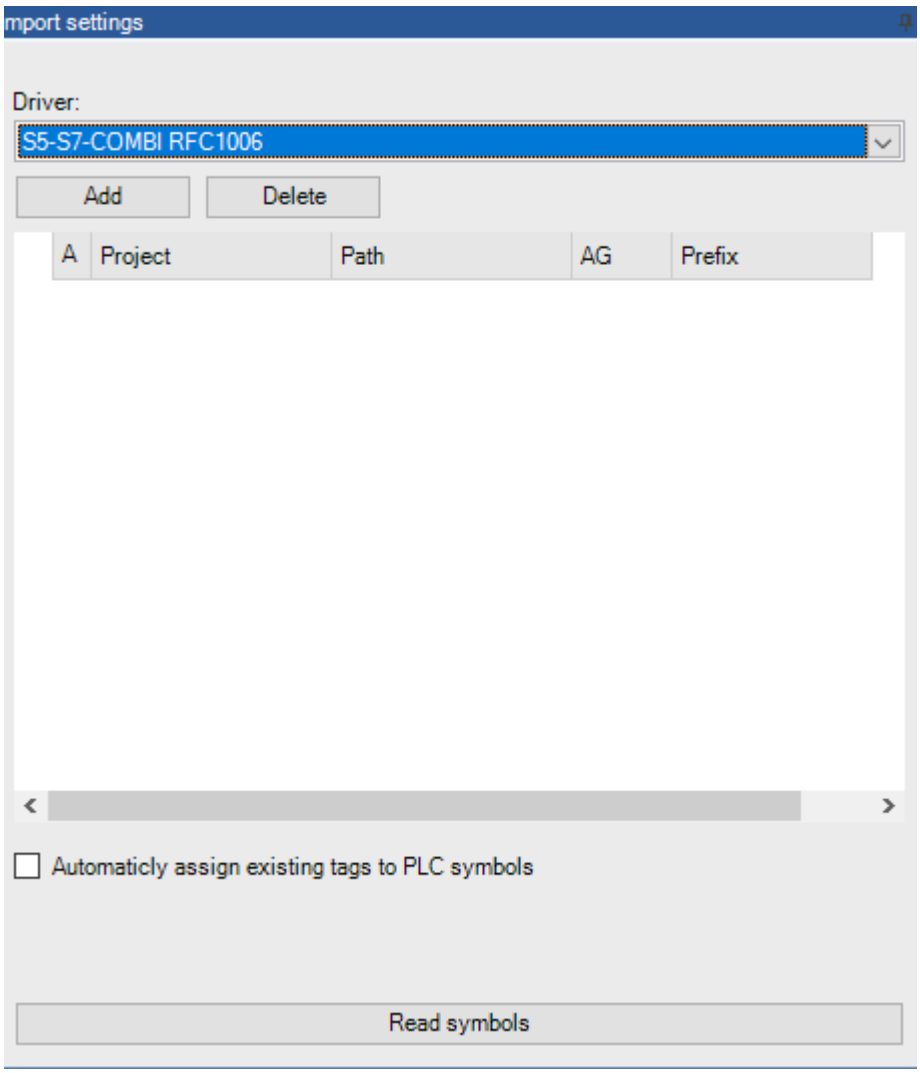


Fig. 30 Default import settings

After opening the S7 project, the flags, inputs, outputs and DB's to be imported can be selected. Under the column AG, the AG can already be predefined. The selected variables from the project are imported into PROCON-WEB via "Import symbols".

The imported variables are displayed in the workspace. The "Action" column or the context menu of the right mouse button is used to select whether the variable should be imported.

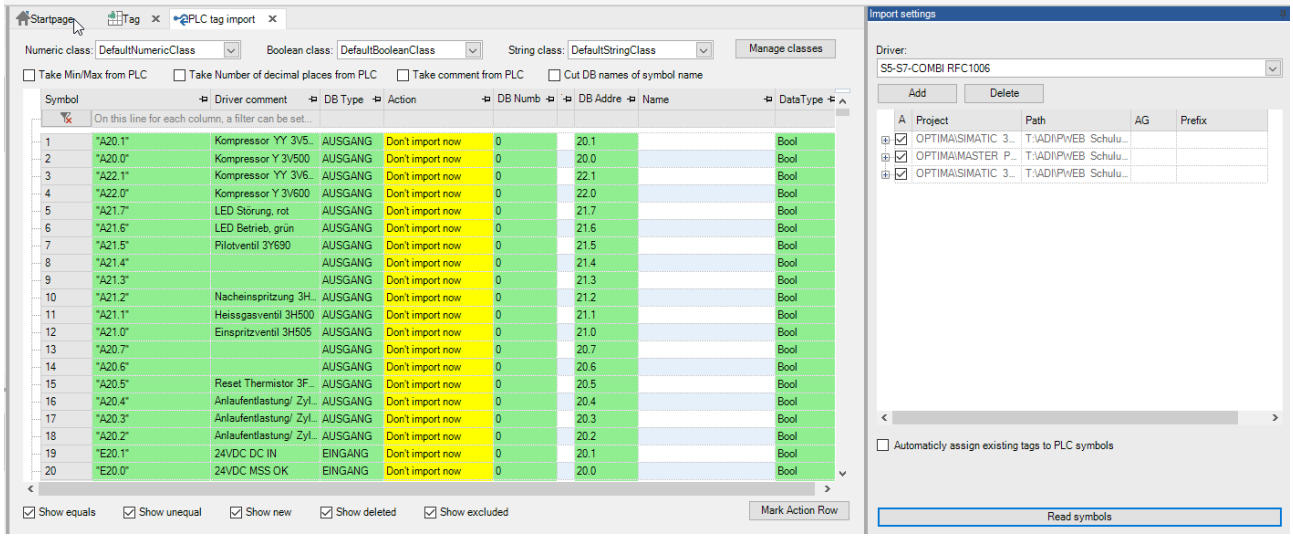


Fig. 31 Import of the variables from SPS-Projekt

5.8. PLC-Structure-Import

With drivers such as 3S Arti, 3S PLC Handler or Beckhoff Symbol, it is possible to import structures that are defined in the control program and assign them to the corresponding variables. To do this, the driver must first be selected in the driver selection.

In the main window of the PLC import, the existing structures in the PLC project are displayed after the symbols have been imported with the option "Show structures". The required structures are selected via the checkboxes. If not, all sub elements are required, the structure can only be partially imported. After the structure element selection, the structures can be imported with "Import structures".

After importing the structures, the option "Assign structures to variables" is available. with this option the system creates the corresponding instances of the structure during variable import and assigns them to the variables.

HINT

An automatic assignment of the variables to the structures can only take place if the structures have been imported. If the variables are imported before the structures, the assignment must be done manually.

5.9. Update PLC-Import

If variables have already been imported or created in PROCON-WEB and the associated PLC program has been changed, the variables can be updated by another import.

The import detects whether the variables to be imported from the PLC program already exist or not.

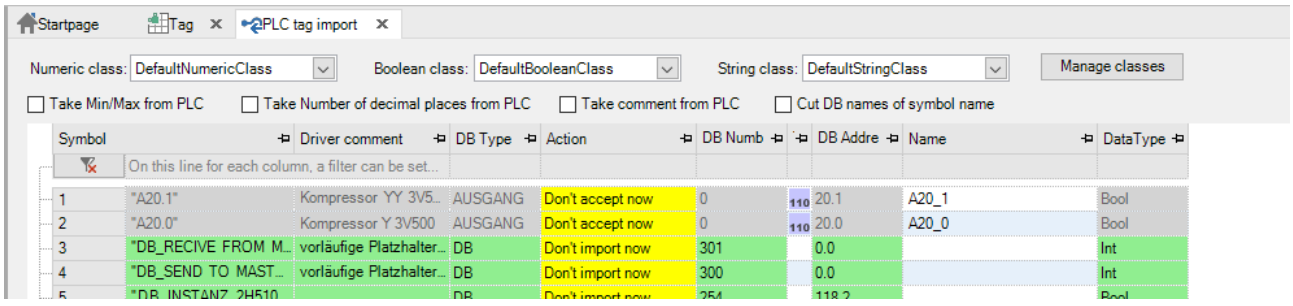


Fig. 32 PLC-Import with already existing variables

Depending on whether the variable already exists or not, the import offers various options on how to deal with these variables.

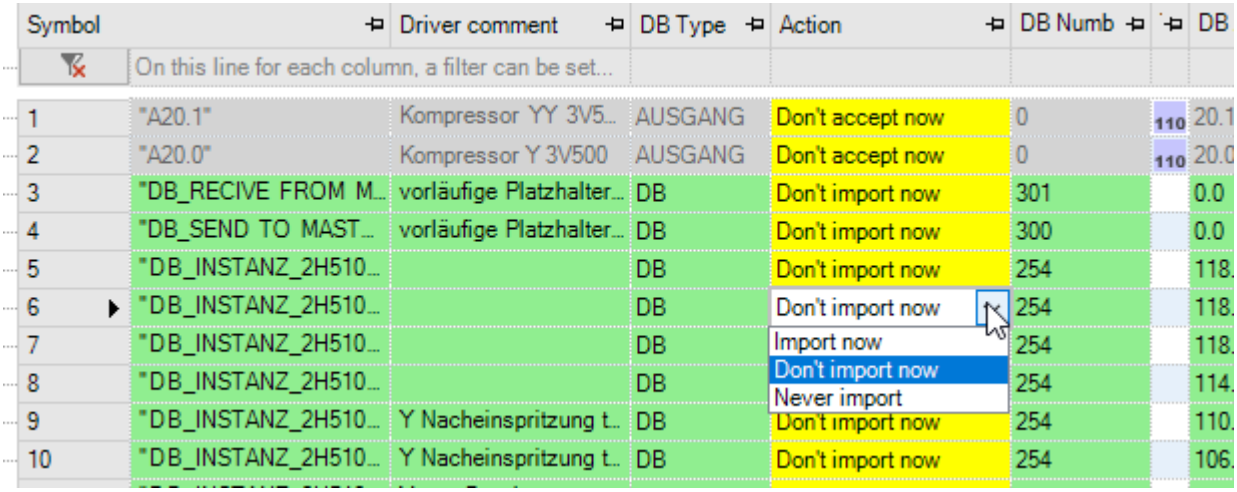


Fig. 33 PLC-Import options

This also makes it possible to make changes to variables made in the PLC program in PROCON-WEB as well e.g., changes to addresses, etc.

5.10. Driver Interface

PROCON-WEB provides an interface for some newer drivers. This interface is intended to enable a closer coupling between Designer and driver as well as a departure from the "driver.ini".

Connections for the new drivers can be created and parameterized via the driver dialogue.

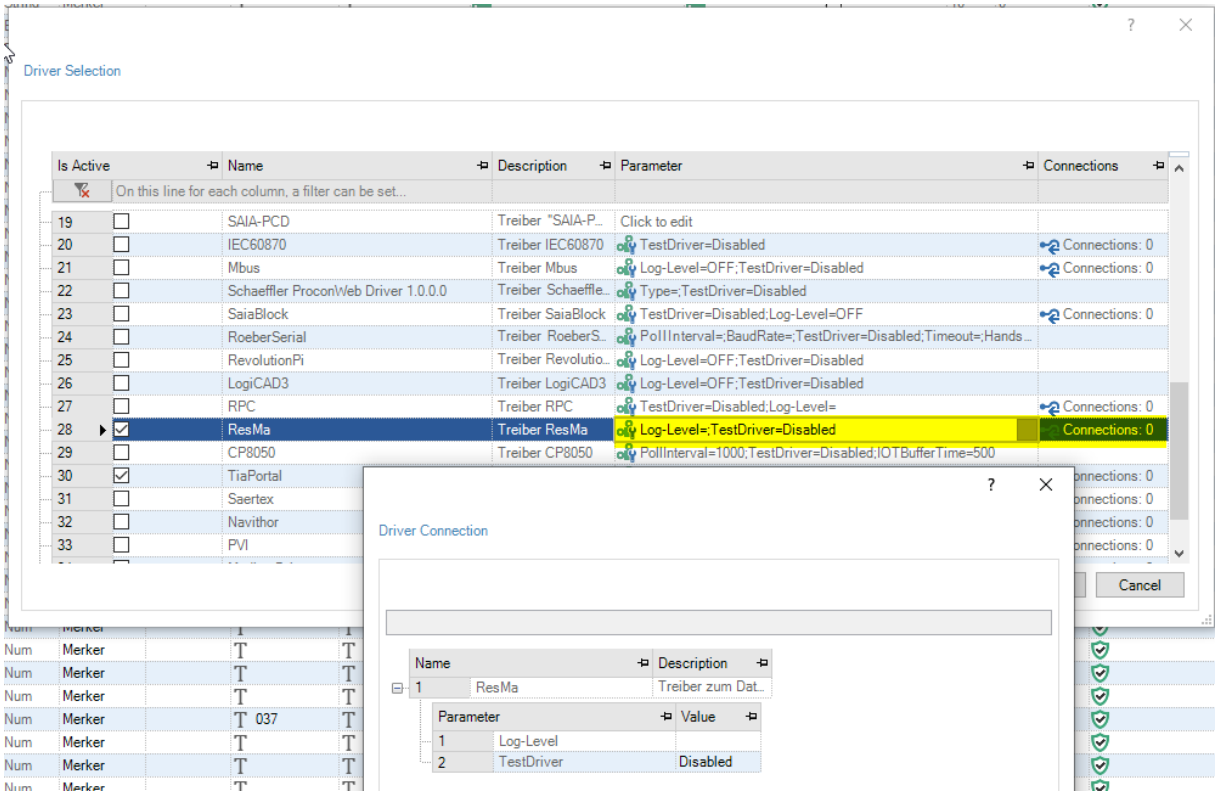


Fig. 34 Driver-Dialogue

5.11. Creating Driver Connections

If the driver supports connections, the dialogue for defining connections can be opened via the driver dialogue or via the tag grid.

New connections are created either via the context menu or via the "New" button.

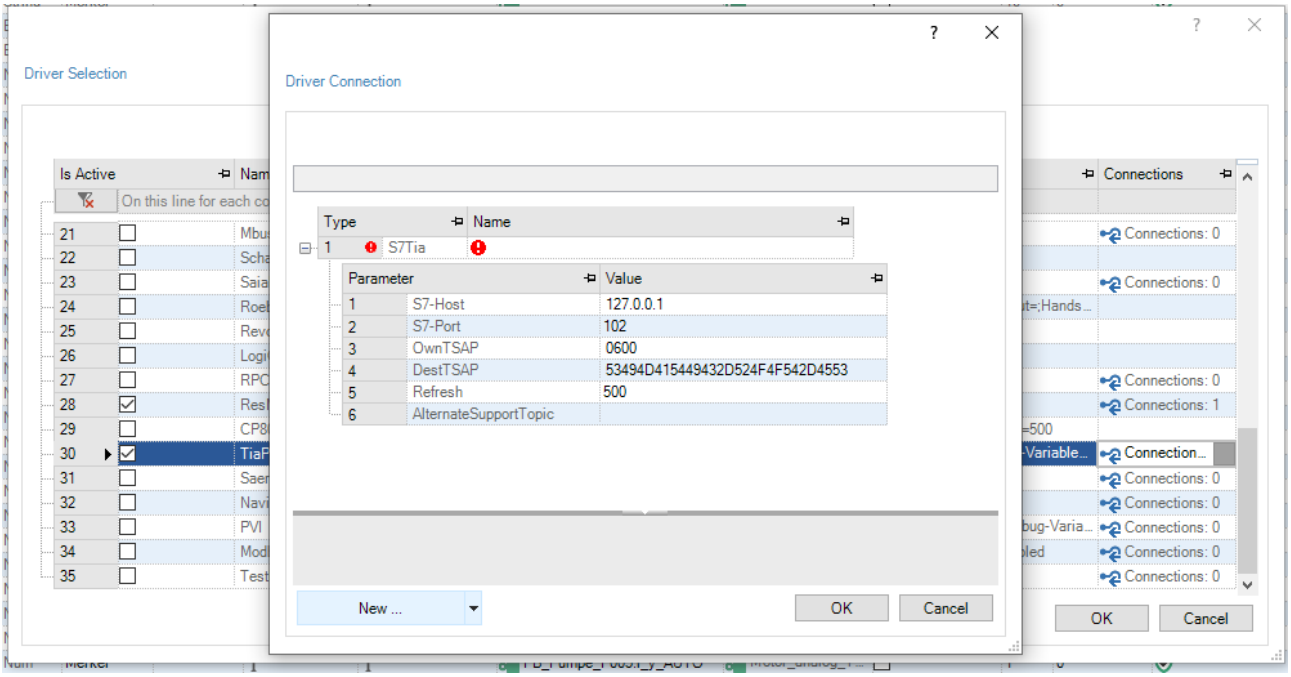


Fig. 35 Creating and Editing Connections

5.12. Driver-specific parameters

For the drivers based on the new driver interface, there may be driver-specific parameters that apply to all connections of the driver. These parameters are also edited via a dialogue.

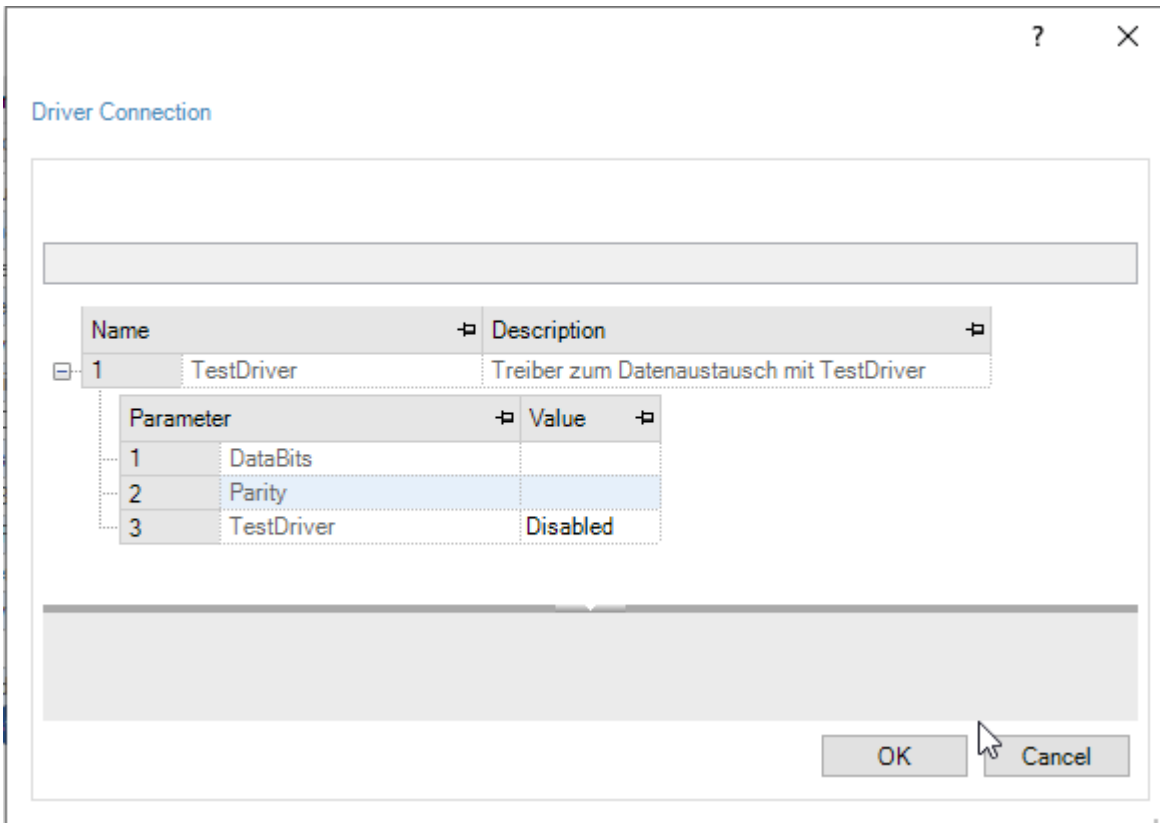


Fig. 36 Setting driver specific parameters

5.13. System variables (only SCADA)

These system variables allow access to system information that was previously either not obtained at all or only via scripts.

Some system variables are defined globally i.e., they have the same value everywhere and in every client. Some system variables are valid locally i.e., each client has its own variable budget.

The list of system variables is constantly being added and can therefore have new possibilities at any time. System variables are provided server-specifically.

5.14. Structures

Concept

In Structure Editor, data structures consisting of numeric, logical, and text variables can be created. Any number of instances can be created of these structures. These instances can be assigned to so-called automation objects in picture montage. An automation object consists of a group of dynamization elements that are assigned to structure elements. The displayed structure class cannot be edited.

HINT

Structure and instance information should preferably be generated via the variable import. The previously partially used functions for mapping variables to control addresses (e.g., Simatic S5 in DBs) are still available but not recommended and time-consuming!

Editing of structures

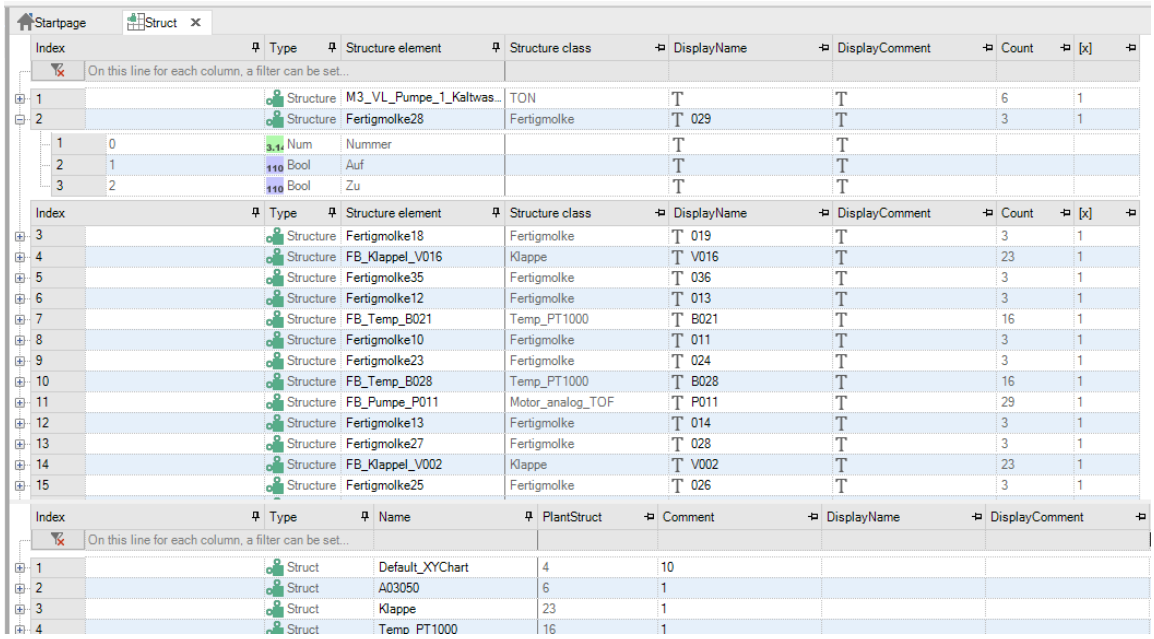


Fig. 37 Structure Editor

To be able to create structures, the option "Create structure" is selected in the structure editor via the context menu and a name is assigned to the structure. Logical, numeric, and text variable classes can be assigned to each structure. Furthermore, existing structures can also be inserted as a substructure for cascading.

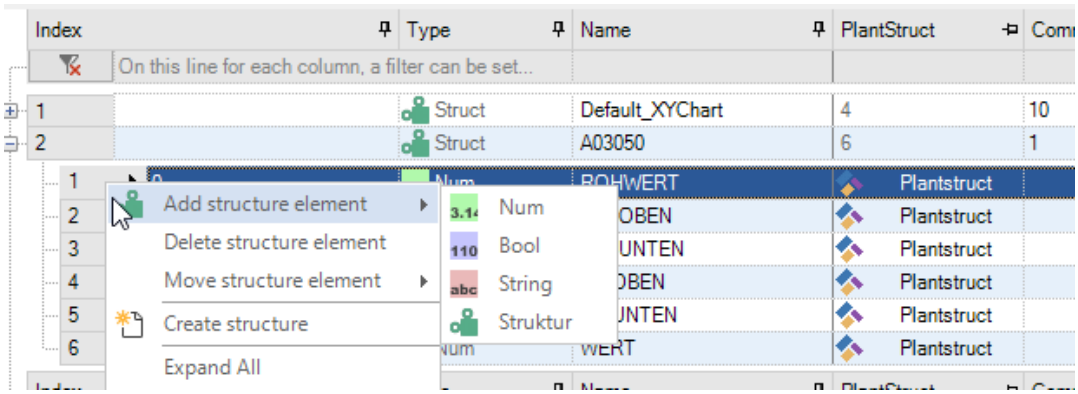


Fig. 38 Insert structure elements

If no instance of a structure has been created the order of the structure elements can be changed or structure elements can be deleted.

Deleting of structures

Structures can be deleted via the context menu of the right mouse button "Delete Structure". It should be noted that only unreferenced structures can be deleted. If instances of a structure exist, all instances of the structure must first be deleted.

5.15. Instances

To create instances of a structure, the structure in question is selected and "Create instance of this structure" is selected from the context menu. This opens the "Add Instance" dialogue.

Deleting Instances

To delete instances of structures, the corresponding instance is selected via the "Delete instance" option.

If variables are already referenced to the instance, the following dialogue appears.

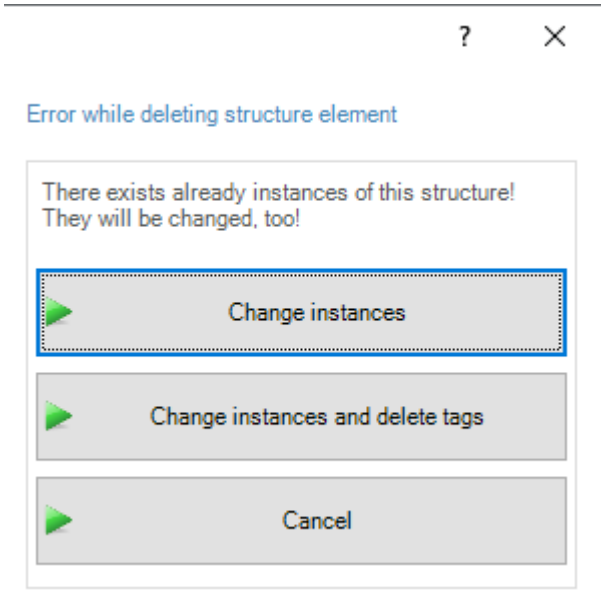


Fig. 39 Alert deleting instances

This dialogue allows the user to select whether to delete the referenced variables or to remove only the instance information. after you select the appropriate option, the instance is deleted.

HINT

only instances that are not assigned to an automation object can be deleted!

Assignment of Instances in the Process Variable Editor

In the Process Variable Editor, process variables can be assigned to the corresponding structure instance using the "Structure Instance Element" column.

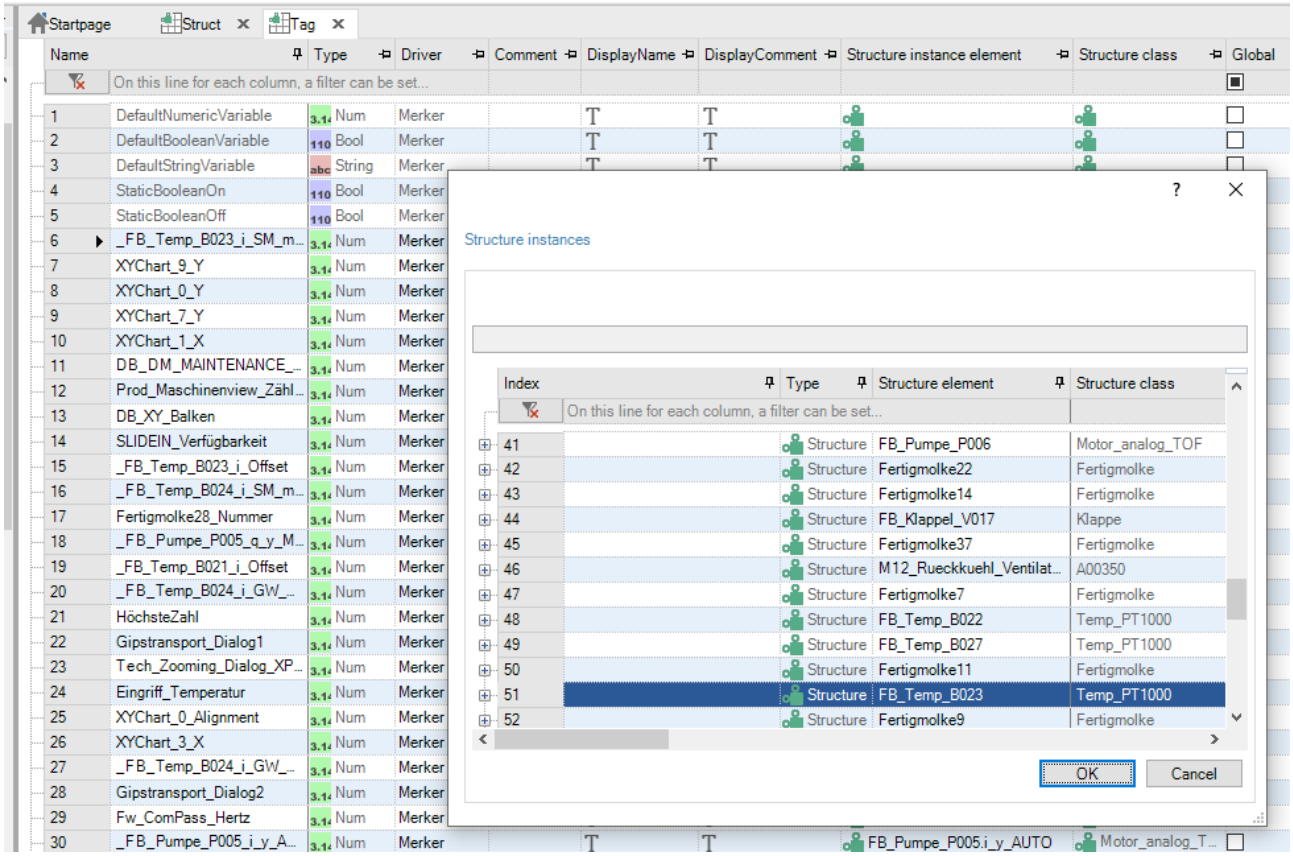


Fig. 40 Select structure instance element

6. Alarm processing

6.1. Messages and groups

Message processing is used to record, display, and log messages from the ongoing plant process. There are eight categories of messages:

- Alarm (serious fault, usually with plant downtime)
- Warning (indication of impending serious problem)
- Message (important indication of possible problem)
- Logging (any interpretation)
- Machine times (any interpretation)
- Status (any interpretation)
- Times (any interpretation)
- Availability (any interpretation)

All messages can also be classified into a four-stage group concept. To do this, a group message must be defined for each message group. Subsequently, each message can be classified into up to four group levels. The first group level thus identifies e.g., plant texts, and aggregates via the second level. These group messages are also recorded and can set e.g., collective outputs to be used as status information.

At run time, all active messages are displayed in the message list. Each message is stored in the log. In the SCADA variant, all messages that occur are stored in a SQL database. It is possible to evaluate the faults via database programs such as Microsoft SQL Server.

6.2. Definition of messages

The Messages and Groups editor is divided into two panes. Individual messages are created in the upper area and the group messages in the lower area. To define a message, the context menu is called up in the editor's workspace with the right mouse button and the "Create message" option is selected. The system automatically creates a message that must be parameterized by the user.

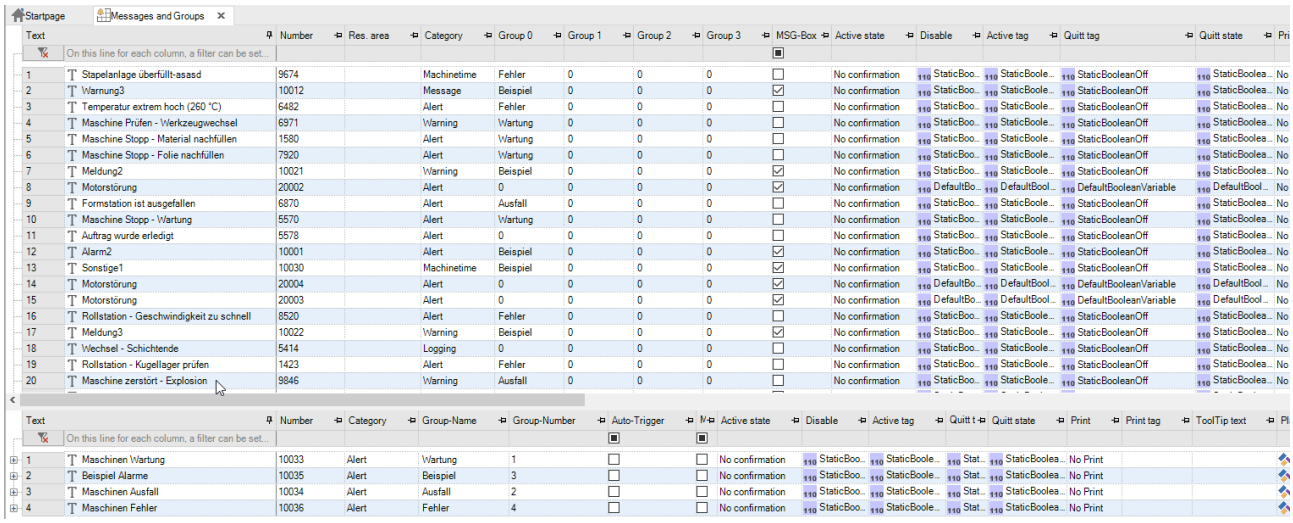


Fig. 41 Definition of Messages

6.3. Including variables in messages (not available in Embedded System)

To include a process variable in the message text, the user can select the option "Insert process variable" in the context menu and select the corresponding process variable. After adopting a logical, numeric or text variable, it is automatically entered in the string with the corresponding identifiers.

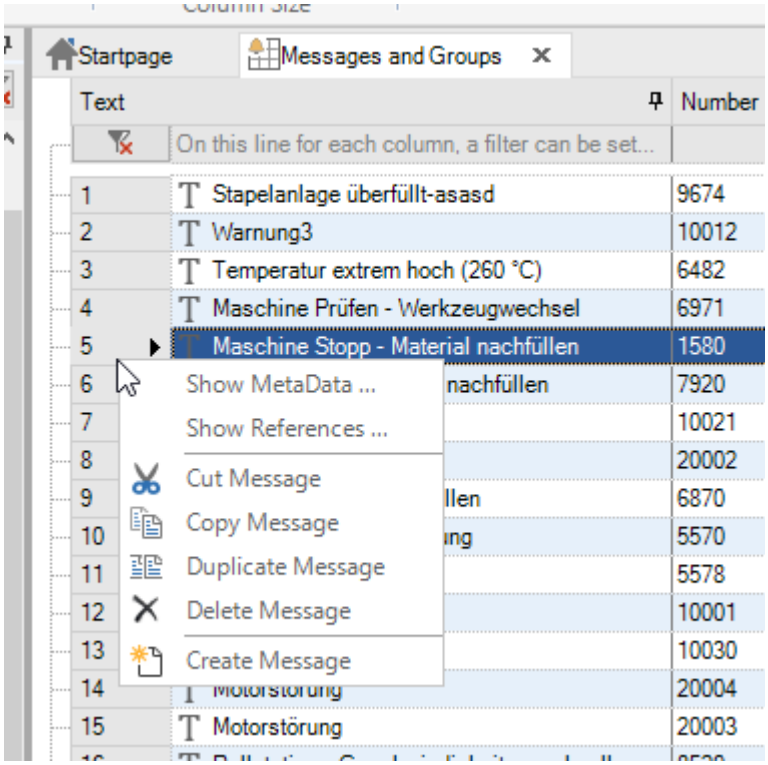


Fig. 42 Including Process Variables into alarm texts

HINT

When inserting process variables into the message text, make sure that the maximum number of characters of 127 characters including the variable length (number of characters for text variables, number of digits for numeric and logical variables) is not exceeded, otherwise the value of the variable will not be displayed!

HINT

The receipt output is not automatically deleted when the message goes out of the list. The user is responsible for deleting the receipt output when the message has gone out of the list.

6.4. Export/Import of messages

With the message import/export, PROCON-WEB provides a powerful tool for efficient and fast processing of messages outside the Designer. The exported data is available in XML format for further processing in a word processing program or in MS Excel. The processing in MS Excel is particularly supported, as an optimal, sorted processing is possible here.

To execute the export, at least one message must be defined in the Designer. This serves as a template for additional, externally added messages.

HINT

If only one message is defined, a default message is exported, as MS Excel needs at least 2 lines to display and save the export file correctly. The default message must not be changed.

Message import can be performed with various options. Message definitions can be replaced, or messages can be added to the existing definitions.

The message import/export is available under the ribbon tab Project Environment -> Import/Export Messages.

	A	B	C	D	E	F	G
1	Type	Id	Number	AlertText	Alertbox	PrintType	PrinttagIn
2	CustomAlert	8691e207-f1e2-4df7-a080-015d33	309	Störung Transportband FN 6642	True	NoPrint	StaticBooleanOff
3	CustomAlert	d7366ead-9d8c-4890-bac3-03644	206	SPC: Regelverletzung 4: 8 Werte(ID von %NAlert_IDR4VonOber% bis %NAlert_I	True	NoPrint	StaticBooleanOff
4	CustomAlert	461d4ea7-2b67-4dd4-9d84-037e0	2	Extruder 2 Waage 2 Abbruch Dosiervorgang	False	NoPrint	StaticBooleanOff
5	CustomAlert	d3a24eff-affd-4e6c-93f5-0d0b3a	333	DIN_CO Untersuchung	False	NoPrint	StaticBooleanOff
6	CustomAlert	fed35ba9-ea9d-4568-8fef-0d4216	110	Aufnehmfehler	False	NoPrint	StaticBooleanOff
7	CustomAlert	86ffff62-433a-46b7-b442-0d6b8f3	328	Störung Füller 2	True	NoPrint	StaticBooleanOff
8	CustomAlert	9efa7d9e-d973-409f-968b-109cf3	329	Störung Füller 1	True	NoPrint	StaticBooleanOff
9	CustomAlert	b6a5f6c9-538e-4ef0-b9a8-1d9c35	202	SPC: Regelverletzung 2: 2 von 3 Werten(ID von %NAlert_IDR2VonOber% bis %N	True	NoPrint	StaticBooleanOff
10	CustomAlert	920d4951-0cfc-4c2c-9f44-227c370	339	DIN_BE Einrichten	False	NoPrint	StaticBooleanOff
11	CustomAlert	0b1eae94-57d1-48ff-8d39-22de1f	315	Tür 6 geöffnet	True	NoPrint	StaticBooleanOff
12	CustomAlert	961c3f49-0f07-4315-b56e-24799c	100	Freigabe_fehlt	False	NoPrint	StaticBooleanOff
13	CustomAlert	18d21a9b-2c38-474a-9c86-268b17	301	Not Aus Bereich Folienrolle 1 oben	True	NoPrint	StaticBooleanOff
14	CustomAlert	308b1859-f128-4d50-8e47-2898e5	308	Stau Folienrolle 2	True	NoPrint	StaticBooleanOff
15	CustomAlert	f7460288-450b-4ad1-ad46-2cc246	111	Stoerung_Extruder2	False	NoPrint	StaticBooleanOff
16	CustomAlert	8ba719d9-9ea3-480d-bedd-2d17e	338	DIN_FI Sonstige	False	NoPrint	StaticBooleanOff
17	CustomAlert	dc53de72-2984-425d-928a-2dcde	303	Not Aus Bereich PC	True	NoPrint	StaticBooleanOff
18	CustomAlert	88a4a07d-e811-4086-9ebc-2e4c2	214	SQL Insert Fehler	True	NoPrint	StaticBooleanOff
19	CustomAlert	3a30a6df-8eb2-48c2-a03e-2f8b22	207	SPC: Regelverletzung 4: 8 Werte(ID von %NAlert_IDR4VonUnter% bis %NAlert_	True	NoPrint	StaticBooleanOff
20	CustomAlert	407844aa-6cad-42e2-a041-35c70c	334	DIN_CO Sonst	False	NoPrint	StaticBooleanOff
21	CustomAlert	3f946e48-7c80-4e3b-a93c-3e6b9c	205	SPC: Regelverletzung 3: 4 von 5 Werten(ID von %NAlert_IDR3VonUnter% bis %I	True	NoPrint	StaticBooleanOff
22	CustomAlert	58081a4b-6b91-4702-8972-3fb773	311	Tür 2 geöffnet	True	NoPrint	StaticBooleanOff
23	CustomAlert	25f65b47-3bd3-4e4e-879d-411ad	312	Tür 3 geöffnet	True	NoPrint	StaticBooleanOff

Tabelle1 Tabelle2 Tabelle3

Fig. 43 Import/export of messages

6.5. System Messages

For system messages, the message texts can be changed in a user-defined manner. These texts can also be exported to MS Excel via the text export and edited there.

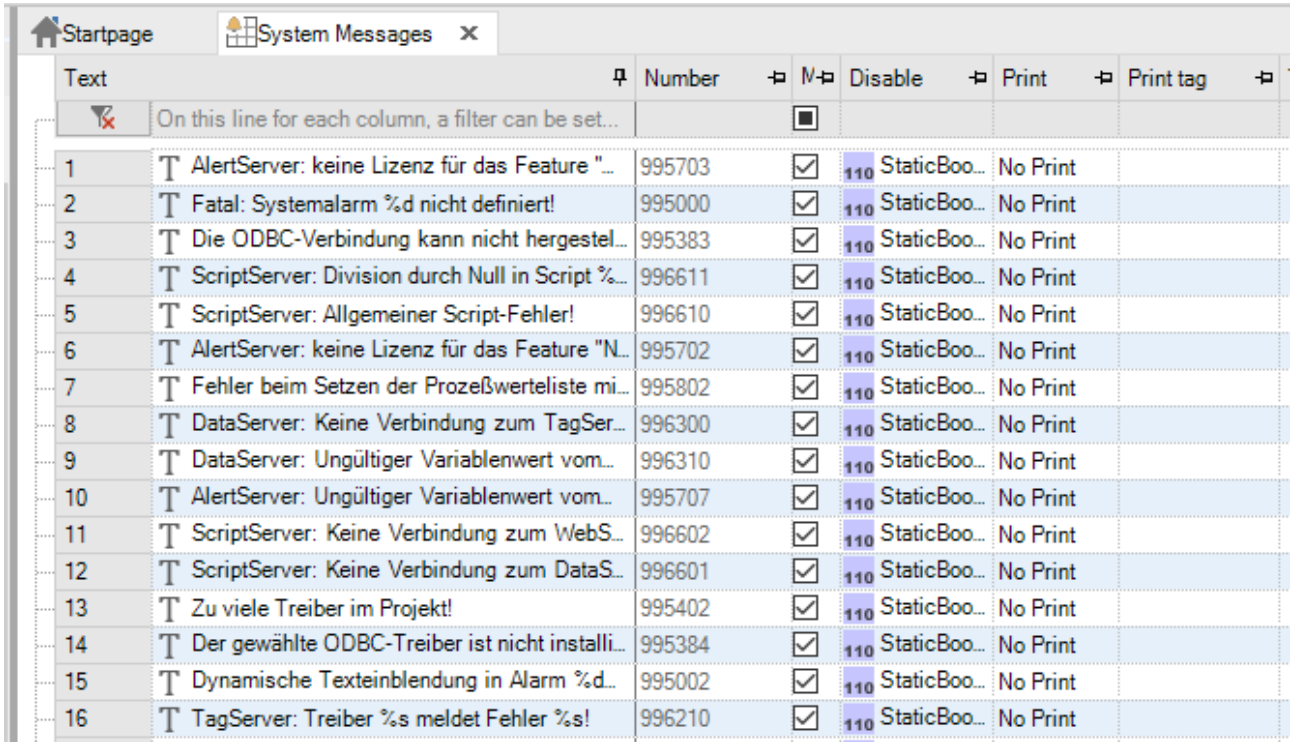


Fig. 44 System Messages

In addition to the message texts, print variables can be assigned and the message box can be activated or deactivated for each individual system message. It is also possible to deactivate special system messages via a logical process variable. All other settings are specified by the system and cannot be changed.

INFORMATION

It should be noted that the support of our support can be made more difficult by changing the system message texts.

6.6. Logbook entries

In the logbook entries item, the texts of the entries can be changed user-defined or translated for multilingual projects.

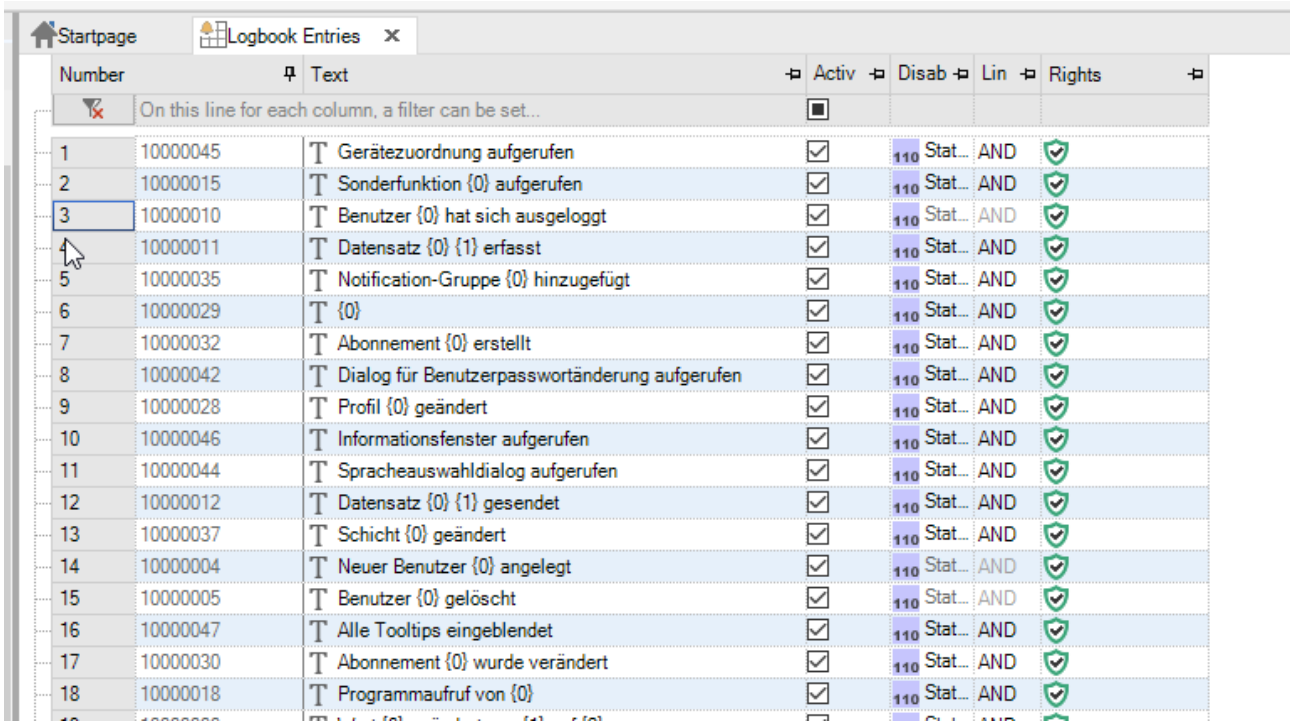


Fig. 45 Logbook entries

In addition, individual logbook entries can be deactivated or activated.

The entries can also be activated and deactivated via a bool or user rights. The link can be used to define whether the activation/deactivation of the entry is done by a right and/or a tag.

HINT

The logbook entries 10000004 up to 10000010 and 10000040 (from the User Activities area) cannot be deactivated or activated over one day because the UserManager has no connection to the TagServer.

There is also a new column "Logbook" in the process variable overview. The flag can be used to decide whether an entry should generally be generated for this variable or not. The default setting is “false“.

A kind of special status has here the entry "10000029", this is used for the script function "LogEventString".

HINT

The curly braces '{}' and their contents must not be changed under any circumstances, otherwise there may be malfunctions in the runtime.

The logbook can be used as an audit trail in machines or plants that need to achieve FDA compliance. For this purpose, the generation and checking of a checksum must be activated. Attributes to input fields can be used to force new authentications (re-login as electronic signature) for critical setpoints and optionally also to require the input of comments.

6.7. Message views

For the message grid control to be able to display data at runtime, the Designer must first define what exactly is to be displayed. This can be configured under "Message Processing / Message Views". In the IoT variant, the oldest messages are always displayed at the beginning. It is not possible to change the sorting. Also, the alarm grids can only be displayed in runtime, but not exported (Excel or PDF) or printed.

Here you will find predefined views and corresponding filters:

Default_Aktionsprotokoll_Ansicht: This view displays all messages of the log that are of type Alarm, Message, Warning, or Input (e.g., as an extended AudiTrail).

Default_Eingabeprotokoll_Ansicht: Only the log entries of type Input are displayed here (e.g. as AudiTrail).

Default_Meldungsprotokoll_Ansicht: Displays all messages, messages, and alerts from the log.

Default_Meldungsliste_Ansicht: Displays all messages and alerts in the current alarm list.

Default_Notification_Ansicht: Displays the current notifications.

Default_Logbuch_Ansicht: Displays the logged logbook entries.

Default_LogbuchStatistik: Displays statistics of the logged logbook entries.

Others can be created via "Right-click/Add". A new view element with its subelements appears. Each subelement represents a column from the tables of the AlertServer. some properties cannot be changed but others can be configured.

7. Data

7.1. General

In the component "Data" you will find the editors and configuration options for data management, the data records and the XY curves, as well as the associated view and data sources.

This means that the following services must be configured in total:

- Manage data e.g., for recipes or orders
- Logging of process values in the sense of a data recorder
- Manage curve data (XY curves) captured by a controller for display in a chart

Not all targets (servers) support all the following features described. This range of functions is only possible in the SCADA variant (Windows) without restrictions.

7.2. Data management

Data management is used to store and play back records at the runtime of the application. This means that the following tasks can be implemented:

- Management of machine settings or recipes
- Managing Jobs
- Logging of order processing or batches

Data management is usually implemented via various application-specific tables in the SQL server of the runtime system (PROCON-WEB Server), or via ODBC via other data sources. An extensive range of script functions and functions e.g., for buttons, allow even complex database applications to be implemented. The convenient possibility to define different views on tables, combined with dynamic filters, supports the easy creation of suitable surfaces.

In the IoT variant, data storage can only be done by SQLite.

7.3. Data recorder

The data recorder in PROCON-WEB is used to log process values over a period, i.e., the data recorder fulfills the task of an x-t recorder for the values of process variables. Process values are collected automatically or event-driven and the data is stored in the project runtime database or in an ODBC data source.

The user specifies the time intervals at which the values should be recorded. Possible grids are milliseconds, seconds, minutes, and hours.

In addition, the data recorder can be used for batch logging. The text variable that contains the batch name must exist in the data recorder and be declared as the batch name. The data recorder logs the String value of the text variable. All data with the same string value, which is marked continuously in time, form a batch.

The data can be recorded by the data recorder in four different ways:

- As PROCON-WEB-DataServer data storage: the data of all data recorders are stored in the table "TagLogs" in the runtime database (PWR_<ProjectName>). In each case, a (changed) value of a process variable is stored at a time.
- As a classic table: the data of a data recorder is stored in a table (Dl<LoggerName>) in the runtime database (PWR_<ProjectName>). The recorded data can be evaluated e.B. via external database-capable programs and used, for example, in reports.
- As an external table: the storage is the same here, as with the storage as a data server or data server single table only these are stored in a separate SQL server table.
- As an ODBC data storage: the data of a data recorder is stored in a file or table that can be accessed via ODBC.

A maximum of 1000 data recorders can be defined.

7.4. Principle of operation of the data recorder

The data recorder works type-oriented and thus corresponds to the model of a classic line recorder. All channels are written to the same paper (=table) at the same feed rate (=sampling rate).

When defining a type, the general characteristics of the type, such as recording grid, building the average, file type, etc., are defined and the affected process variables (logical, numeric and text variables) are assigned. Each process variable can be contained in several types at the same time.

To limit the number of file accesses, the size of an internal buffer can be specified for each recording type, which is not backed up until the buffer is filled. Optionally, the mean value can also be formed via this buffer, so that only the mean values can be saved and thus the number of records can be kept smaller.

The process value recording can only be carried out closed and time-normalized, i.e. a record can only be written at specified times (in a time grid). If the start of recording is outside the time grid, the preceding grid time is interpreted as the start time.

A recording type can be edited either automatically or manually. For the type to be recorded automatically, logging begins when the DataServer starts and, if no error occurs, continues until the DataServer is stopped.

A manual recording type can be started and terminated directly from the positive edge of a logical variable. The time entry of a "snapshot" can be made to the second, minute or hour exactly. The accuracy is set by the "Sampling" entry in the configuration window.

By option, the data recorder can automatically delete all files of a recording type after n days.

7.5. XY-Curves

To be able to use a chart in the mode "XY diagram" (see chapter Curve Diagram Control), the XY curves must be defined here. XY curves are arrays of values that are populated by control or scripting. This makes it possible, for example to display the film thickness over the film width or to record fast processes (e.g., a press curve) through the controller and transfer them to the HMI as a data array. By passing arrays with X and Y values, non-series curves (e.g., circles) can also be passed to the chart.

Four different types of XY curves can be defined:

A (standard case): Curves with constant X-distances: All passed Y-values have the same distance to each other on the X-axis (static value) and start at a fixed X-value and end at a fixed X-value (e.g., slide thickness).

B: Curves with X values and a dynamic X distance (the same for all points)

C: Curves with transfer of all coordinates as X and Y values. This allows you to draw unsteady curves (e.g., circles)

D: Text overlays: Using n-instances of a predefined data structure that contains X and Y values, as well as a comment with alignment, texts can be positioned within a diagram. This type is often used in conjunction with another representation to comment on it.

The configuration of all four curve types is in principle similar.

8. Reports (only SCADA)

Reports are implemented in PROCON-WEB via a ReportControl and CrystalReports (SAP) embedded in it. This requires a license for the creation of CrystalReports and knowledge of the structure of SQL databases and SQL queries.

In the Designer, the corresponding reports can be selected for the ReportControl and the dialogues can be configured for feeding the dynamic report parameters (e.g. time selection). The ReportControl is only available for Windows servers (SCADA)!

GTI offers the creation of complex reports as a service.

8.1. Report Configuration

If a connection has been selected, the next item "Report Configuration" can be selected.

With a right-click and the selection of "Add Report" a file selection dialogue opens, in which a report file (*.rpt) can be selected. If a report has been selected, a new line is created for this report. In addition, subordinate lines are created for all parameters contained in the report.

Immediately after adding the report, a red warning message can be seen next to the name of the report. This indicates that a standard OLEDB connection is still selected. This value must still be changed to a valid connection. To do this, you can click on the button in the cell under "OLEDB Connection", which opens a selection dialogue in which all existing connections can be displayed, and the desired one can be selected by double-clicking or clicking on "OK" (after previous selection).

Next to the name is the column "Report", in which the path and file name of the selected report file can be found.

Next to it is a checkbox with which you can select whether the report should be saved in the project database.

1. If the check mark is set, the report is read from the project directory at runtime.
2. If the check mark is not set, the report is read from the set path. This can be an advantage if the report changes after configuration and can thus be exchanged afterwards. The path can still be changed by clicking in the cell if the report is later in a different location.

Then settings for the parameters can be made:

8.2. Profile-Configuration

A profile must then be defined. For this purpose, the item "Profile Configuration" is opened, and a profile is added by right-clicking. Again, a red note appears next to the name, as new profiles refer to a standard report. By clicking on the button in the second column ("Report"), a selection dialogue opens in which a report can be selected. an additional line is then added for each parameter in which settings can be made.

In the upper line, a user level can also be defined, which the user must have at least to be able to see the profile at runtime.

Below is a row for each parameter with the name column, as well as a checkbox ("Show at runtime") and a field for a value. If the check mark in the checkbox is removed, the value in the "Value" field is always and unchangeably transferred to the report as a parameter value at runtime. This results in the following possibility: A report has one or more parameters, which should always remain the same and thus do not have to be entered every time (heading, header/footer...). If the check mark for these parameters is not removed and something is entered in value, this is displayed as a preselection in the input field at runtime.

9. Pictures

9.1. How to create a process picture

In a new PROCON-WEB project, the first picture is already available by default. This picture is in the tree under "Interface" "Start/Layout Pictures"

If further pictures are to be created, proceed as follows:

- Click on "Pictures" in the project tree with the right mouse and select "New" in the context menu. A dialogue opens in which you must select the class (= template) for the new picture.

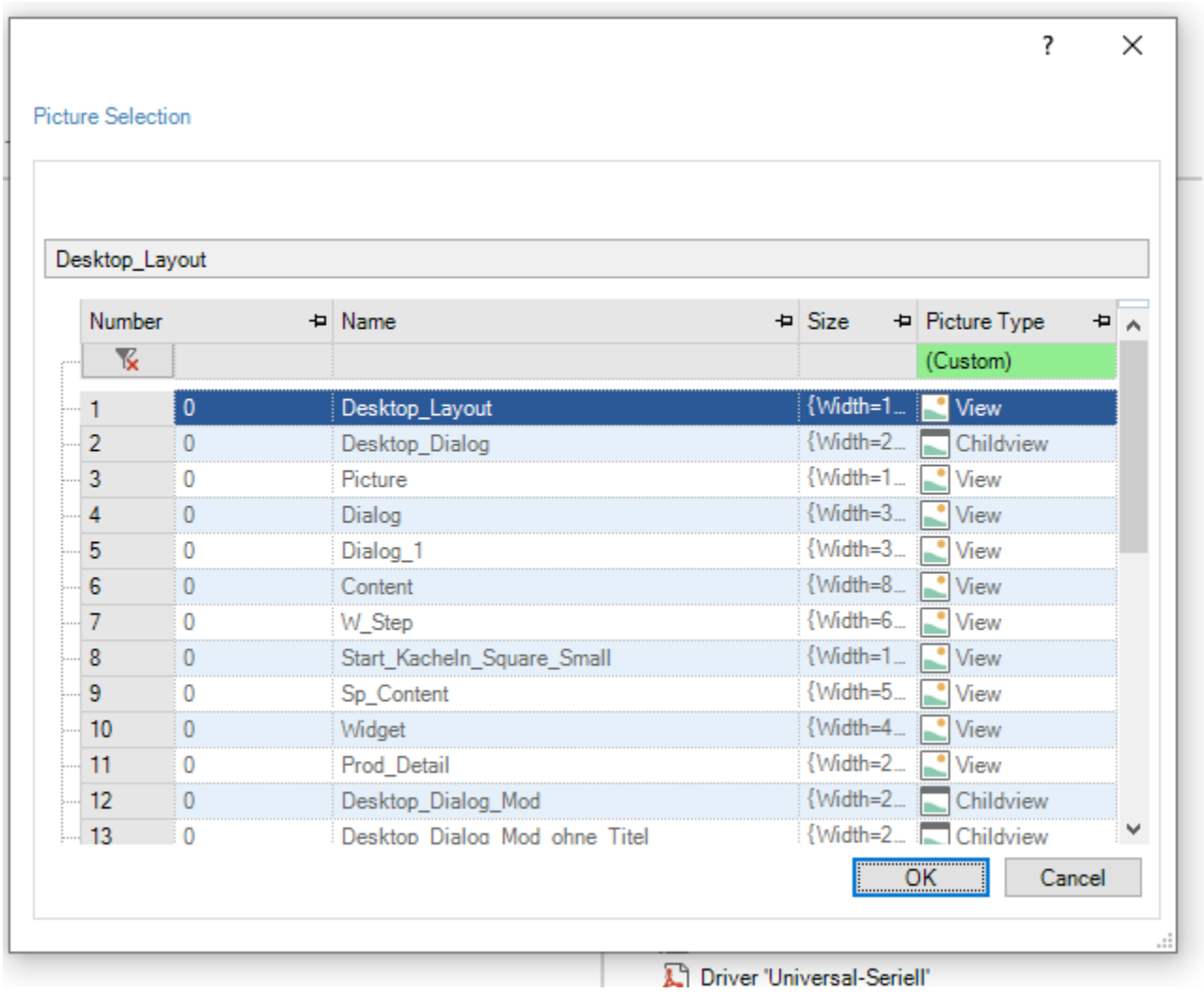


Fig. 46 Select class of picture

- Normally, you can adopt the standard class. A click on "Ok" creates the picture and opens the class instance dialogue to further parameterize the created picture.

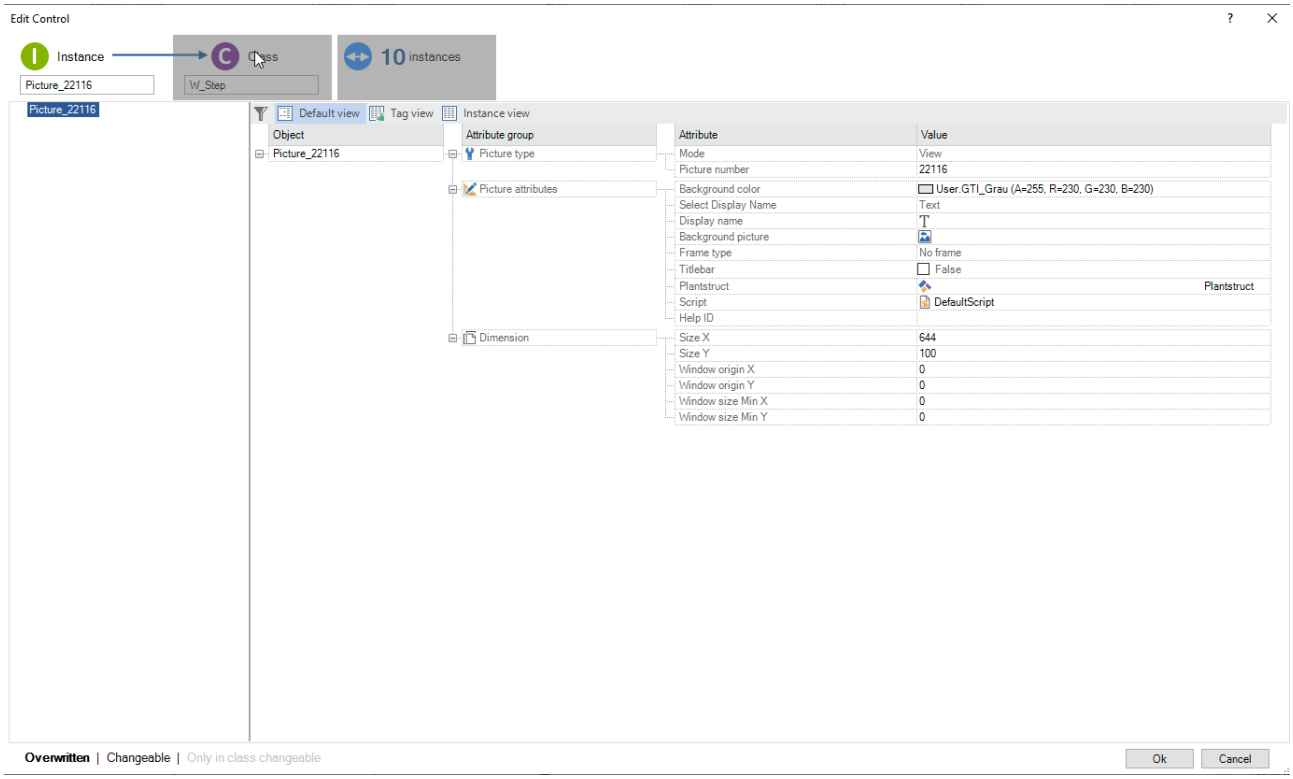


Fig. 47 Picture attributes

Here picture name, picture type, picture size, background colour, etc. are parameterized. A click on "Ok" closes the dialogue and you are in the picture montage

The changes to the picture attributes are immediately displayed in the picture.

9.2. Overview of the picture types

In PROCON-WEB there are four different types of pictures:

- **Picture classes**: Picture classes are to be considered as a template for the later pictures. Picture classes can be created in three different forms: picture, child picture and navigation element.
- **Pictures**: Under Pictures are the instances of the pictures and child pictures
- **Start/Layout screen**: A start, or layout picture can only be defined indirectly. An picture is a start picture if it is referenced in the navigation as a start picture. An picture is a layout if it contains at least one navigation container.
- **Navigation elements**: Navigation elements are pictures used for navigation.

This distinction is also reflected in the project tree.

9.3. Class-Instance-Concept for pictures

In PROCON-WEB the class-instance concept also applies to pictures. Picture classes are to be regarded as a template that applies to all instances belonging to the class. Thus, global changes that are necessary for multiple pictures can be made quickly, as only one point needs to be changed. The changes in the picture class are automatically changed by the system in all picture instances, which saves configuration time and avoids errors.

9.4. Create picture classes

To create a new picture class, right-click on the sub-item "Picture classes" from "Surface" and then on "New picture class".

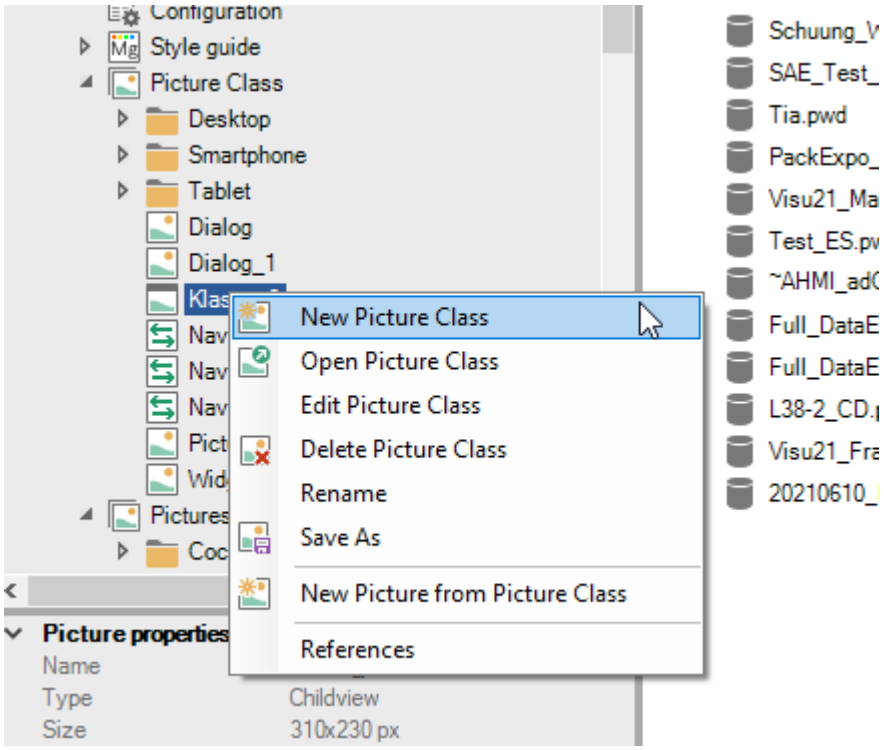


Fig. 48 Create a new picture class

Then the class dialogue opens to immediately make changes to the class.

9.5. Create instances of pictures

To create a new picture instance, right-click Picture Classes and select New Picture of Picture Class.

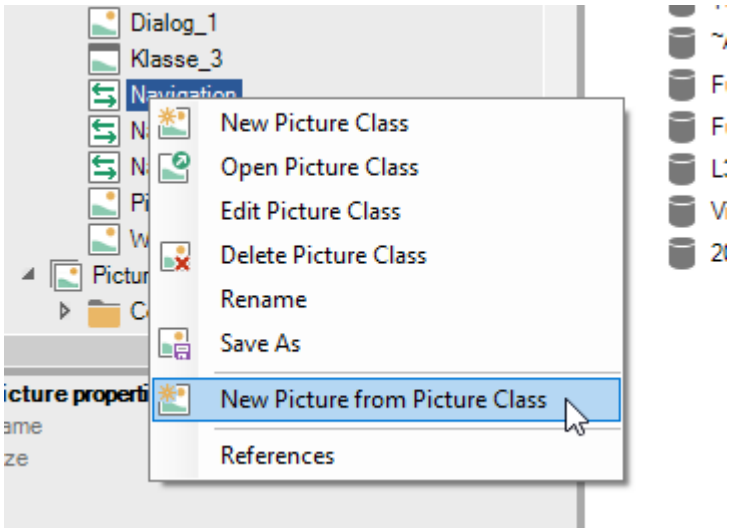


Fig. 49 Create a new instance of a picture class

Then the instance dialogue opens to immediately make changes to the instance.

9.6. The Class-Instance dialogueue

The class instance dialogue is one of the central places in picture montage to edit elements and pictures. In addition, the dialogue provides an overview of the references of the object used.

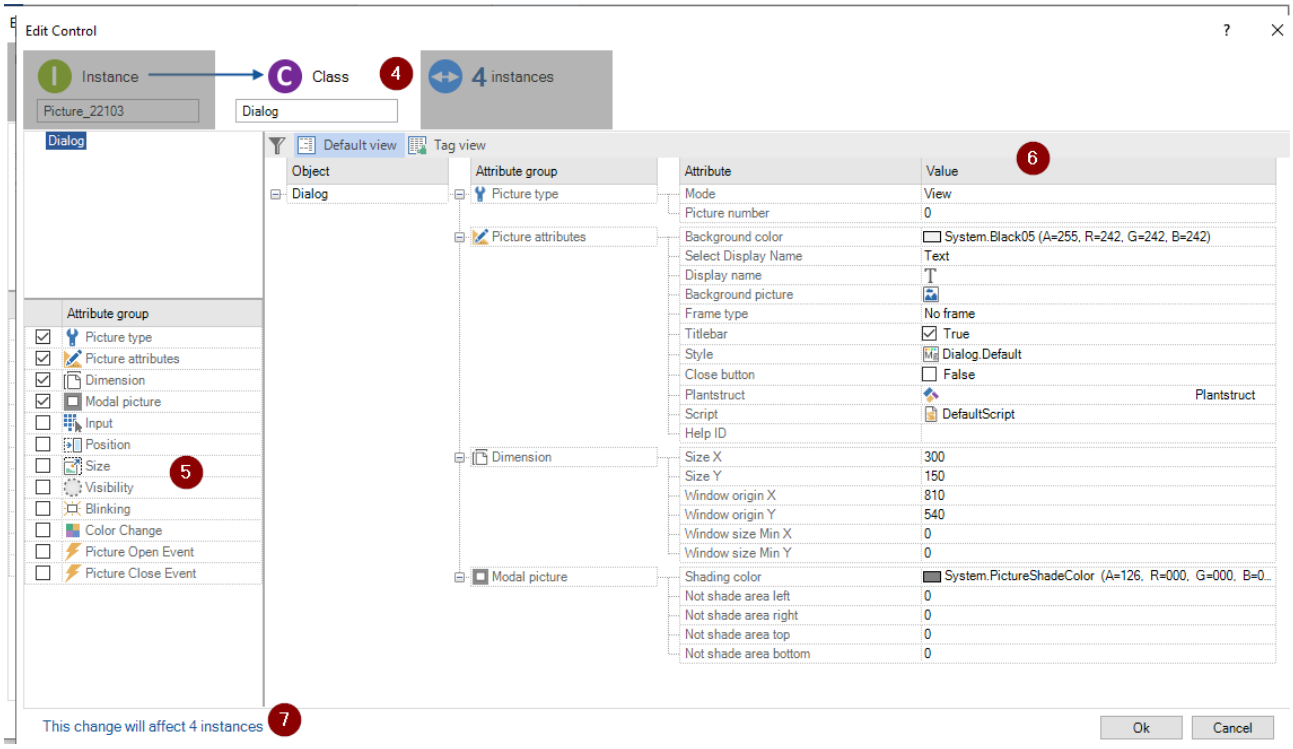


Fig. 50 Class-Instance dialogue

The dialogue is divided into different areas as the upper figure shows.

The class-instance dialogue has 3 "tabs" at the top of the display (area 4). The active tab has the background colour of the dialogue. An inactive tab is dark gray, a disabled tab is light gray. To illustrate the relationship between class and instance, an arrow from the Instance tab to the Class tab is visible. In the Instance and Classes tab, the element name can be changed directly. Furthermore, an arrow is displayed in the class tab for up to 5 instances. The reference tab shows the number of instances directly.

In the left part (area 5) the selected elements are displayed in the upper area, in the class view in the middle area the possible attribute groups, and in the lower part a preview of the element(s).

In the right part (area 6) the parameterization of the element is made.

In the lower part on the left of the dialogue (area 7) status information and a legend are displayed.

9.7. The colour selection Dialogue

The colour selection dialogue of PROCON-WEB makes it possible to select colours and define new ones easily. The dialogue is divided into the areas "System" and "Project".

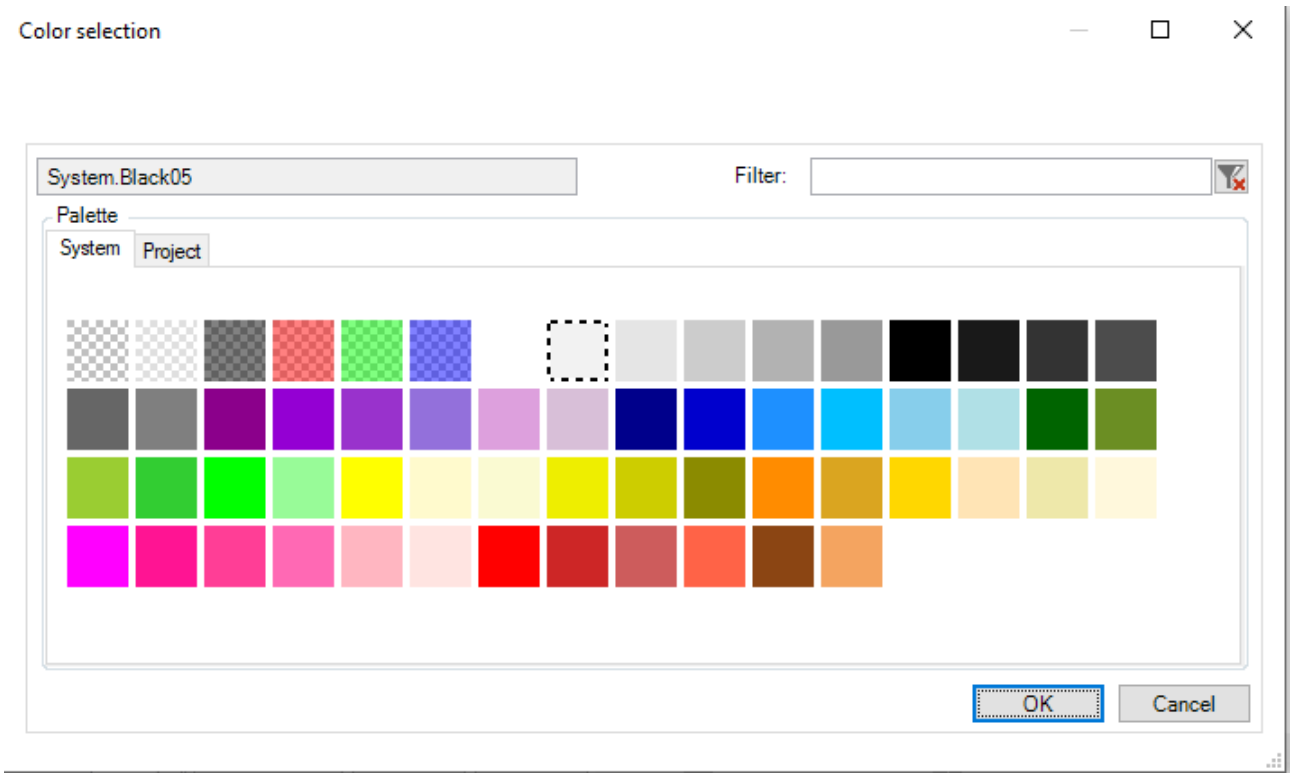


Fig. 51 Colour selection

System

In the "System" area, 60 standard colours are defined for PROCON-WEB These are divided into transparent colours, various shades of gray, red, green, yellow, and blue.

The system colours cannot be edited or changed and are the same for each project.

Project

The Project panel manages the project's custom colours.

9.8. The gradient dialogue

The gradient dialogue is called up in character mode via the gradient icon in the toolbar and is used to define or select gradients for the static symbols.

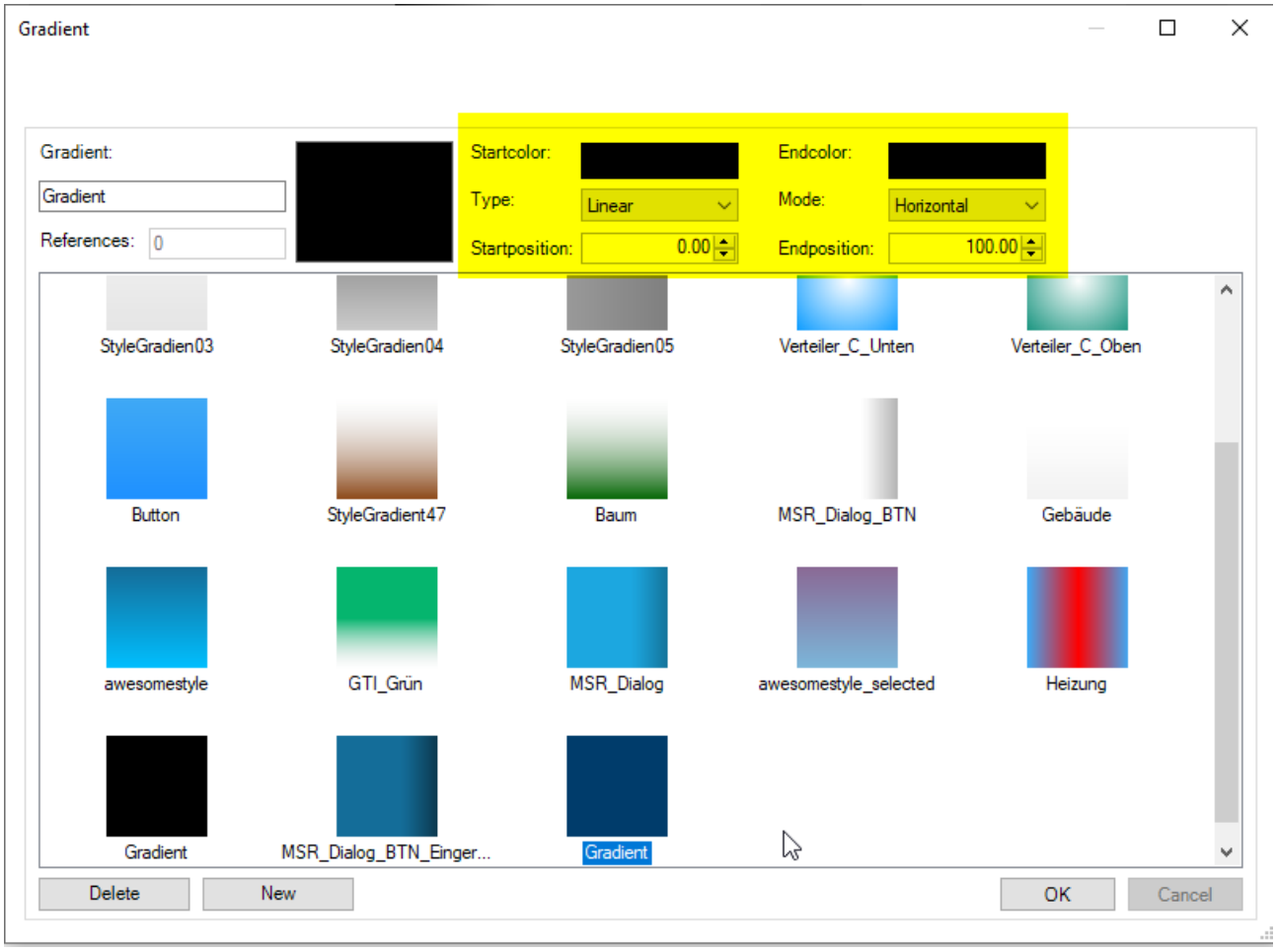


Fig. 52 Gradient dialogue

The parameters of the gradient can be edited immediately if the corresponding gradient is selected.

9.9. The process variables dialogue

The process variables for displaying or dynamizing the picture elements are defined via the process variable dialogue.

In addition, the new tag properties can also be selected here. Tag properties are assigned in controls using the well-known mechanism of process variable assignment. In the selection dialogue, in addition to the tabs "Process Variable" and "System Variable", there is now another tab called "Properties". If this tab is selected, you get the list of all process variables on the one hand and on the other hand a combo box with the possible properties for the variable appears next to the array index field.

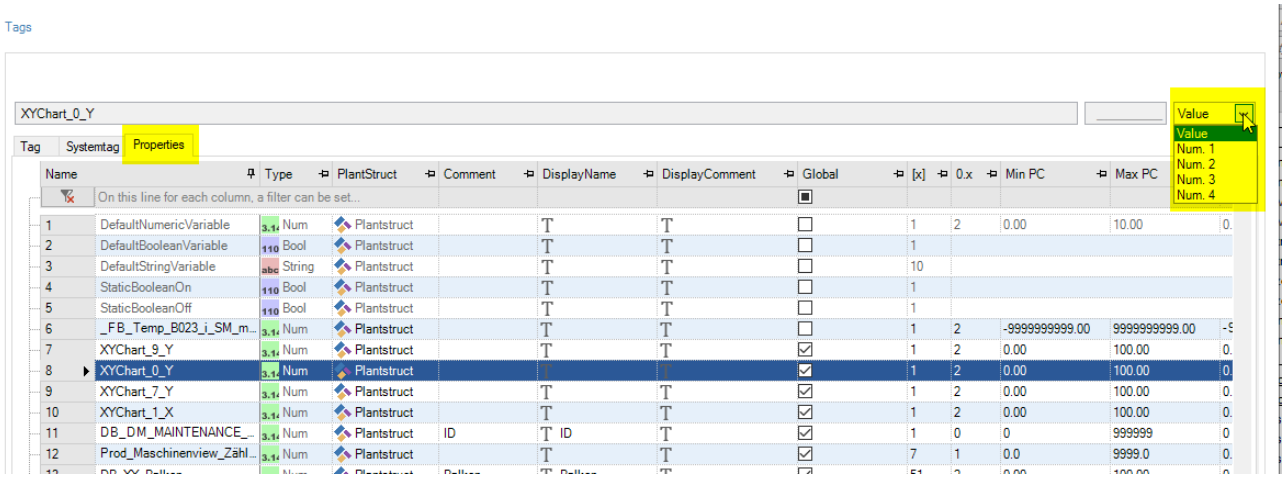


Fig. 53 Processvariables-Dialogue

After a property is assigned, the cell displays the name of the process variable and the property name, separated by a period. Here for example "**StaticBooleanOff.Num. 1**".

9.10. Status indicator in the picture editor

The status display in the picture editor is displayed below the work area. the following items are available in the progress bar.

Symbol	Explanation
(1024/768)	Display of the picture resolution
(823/519)	Display of the current mouse position
100	Current zoom factor in %
Fit	Adjust the zoom factor to display the picture completely, depending on the size of the workspace
100% 400%	Adjust the display to 100 or 400%
	There are no elements outside the picture area
	Elements are outside the picture
	Indicates whether an item is selected or not selected.
or rather	Indicates whether scaling or sizing mode is active.
Assembly Drawing	Indicates whether the user is in drawing mode or picture montage mode.

9.11. Picture types

9.12. Process pictures

One of the three picture types in PROCON-WEB is the process picture. Process pictures are independent pictures in which information is displayed. Only process screens can be defined as a switch-on screen.

9.13. Child picture

Child pictures are not independent pictures and can be called up from previously opened process or child pictures. The child picture depends on the corresponding father picture. The child pictures are only active until they themselves or the associated father pictures are closed.

In the application, child pictures are therefore often used as a dialogue to query, for example, whether you want to save the data in the database or cancel the process.

9.14. Navigation element

A navigation element is like a process picture, only that it can only be entered as a navigation picture under"Device Configuration/Navigation"

9.15. Automation objects

Definition

An automation object consists of several individual static and dynamic objects that are grouped together. For example, the elements can be constant symbols, text boxes, number boxes, or bar charts. The automation object thus describes a complete system component, such as a tank or motor.

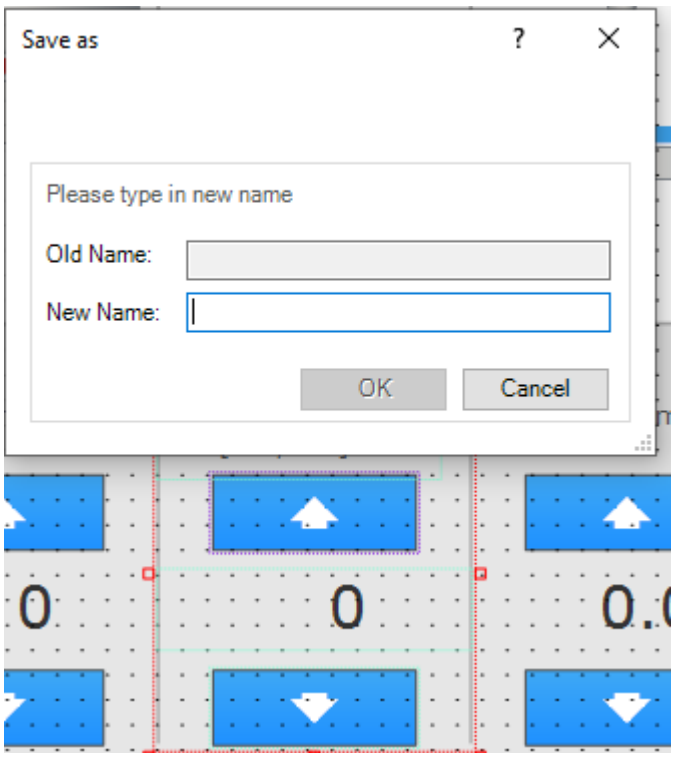


Fig. 54 Automation object Motor

Create an automation objects

To be able to create an automation object, the respective picture elements are selected with the lasso. In the context menu of the right mouse button, the option "Group" is selected, and the name of the automation object is defined.

In the Toolbox under "AO", a class of this automation object is automatically created, which can be used several times in the project.

If existing automation objects are to be changed or extended, the required elements are inserted into the AO via Drag'N'Drop. To remove, the elements to be removed are individually selected and deleted with the "W key".

To transfer the changes to the layout of an automation object to all other instances of the underlying AO, select the option "Layout Instance -> Class" in the context menu of the right mouse button.

For the position of the AO, the upper left element is used as a value of 0.0. The remaining elements get their position values within the AOs relative to this. If a single element of this AOs is used for another picture, it can happen that the already stored values are outside the picture. In this case, the values in the instance of the element must be corrected manually. It is therefore generally recommended not to store any values in the class of this object.

INFORMATION

You cannot copy individual elements from an automation object. Only the complete AO can be copied.

Dynamization of automation objects

In addition to the dynamization that the individual objects of an automation object can have, the automation object itself can also be dynamized.

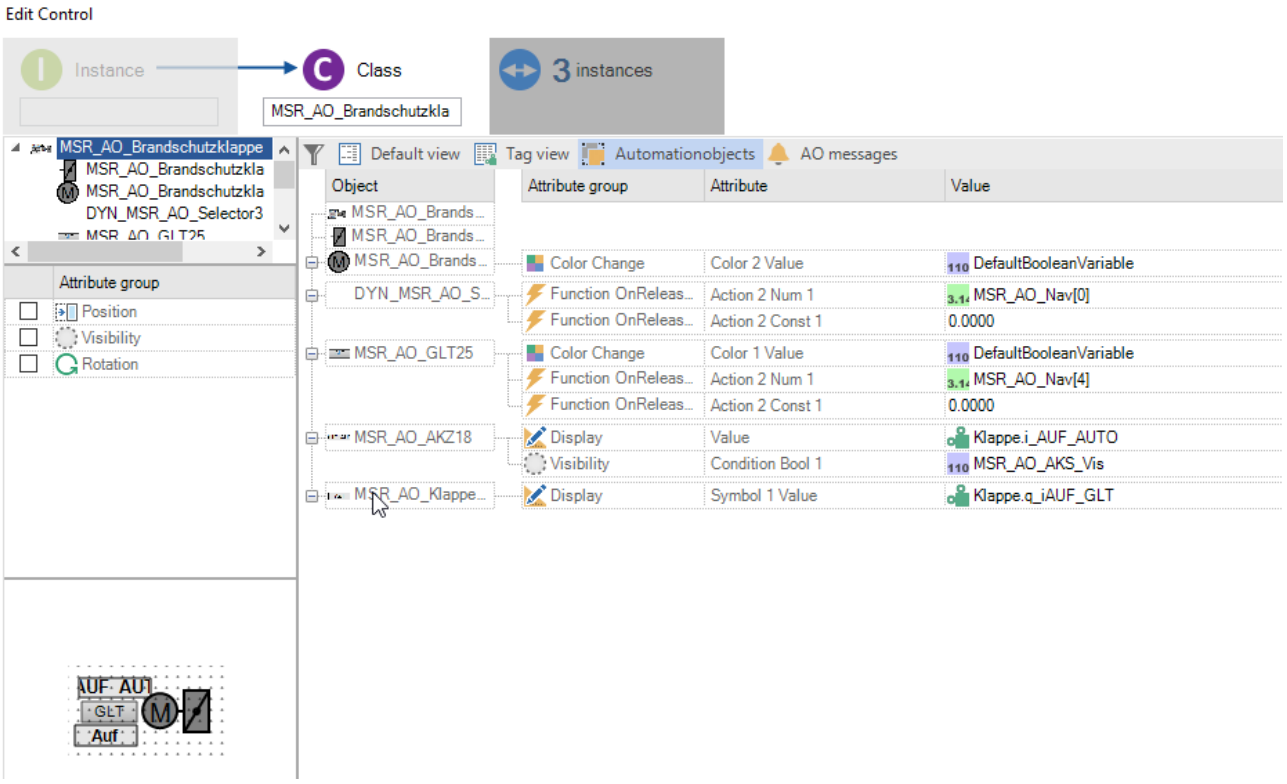


Fig. 55 Dynamization automation objects

Currently, possible dynamizations are:

- Position
- Visibility
- Rotation

The parameterization of the dynamization takes place analogously to the picture objects in PROCON-WEB. However, with the parameters of the AO dynamization itself, no extended assignment, assignment of structure elements or dynamic structure assignment is possible.

Assignment to automation objects

Assignments can be used to connect the same parameters or parameters that are in each context with other parameters.

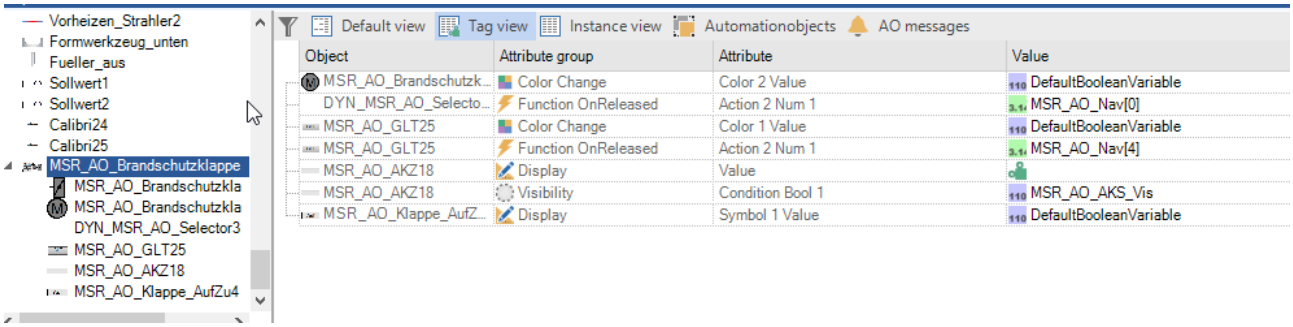


Fig. 56 Assignment in automation objects

In the Properties window, the instance values of the attributes can be mapped to each other. In the figure, one bit should be assigned to each LED. The first element is assigned the first field index of the process variable. The mapping allows the user to associate items with the first item. Thus, a field index can be automatically assigned for each element. If the first instance value is changed, all associated process variables automatically change. Different assignments are marked with different colours.

The assignments are made via the context menu of the right mouse above the element to which it is to be assigned.

Assignment of structure instance objects to automation objects

In PROCON-WEB a structure instance object can be assigned to each automation object. First, a structure must be assigned to the automation object in the class dialogue.

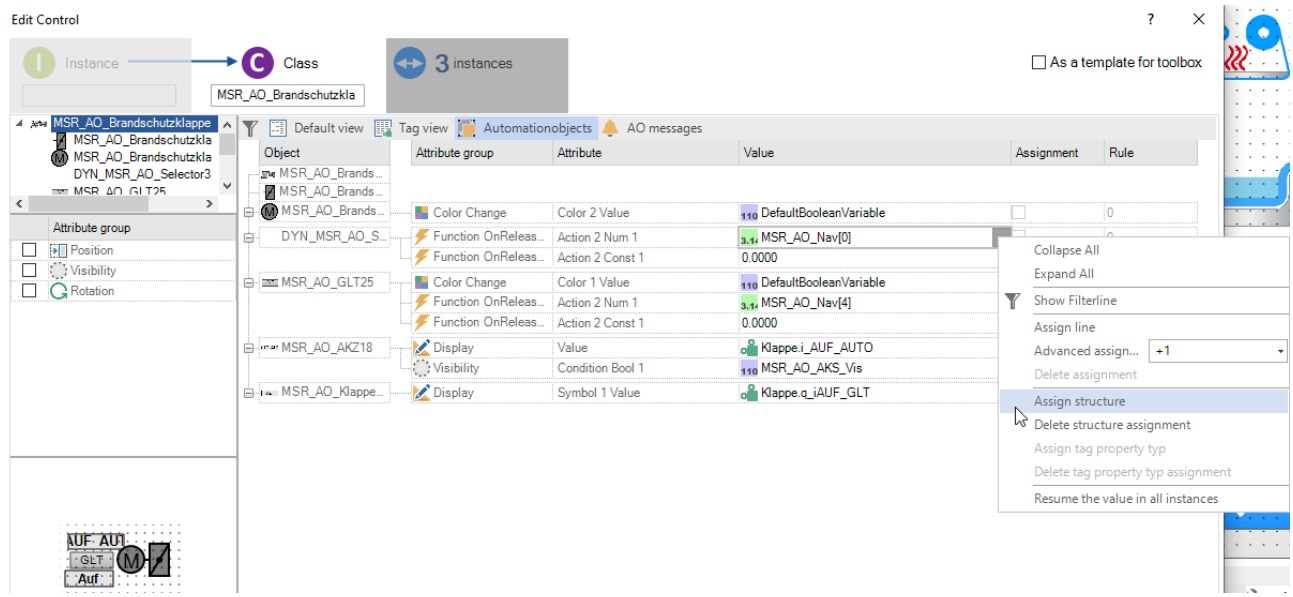


Fig. 57 Structure assignment in the class dialogue of the automation object

To do this, you switch to the view for automation objects and select the corresponding structure via the context menu. In the column Instance Value, a dialogue opens in which the structure element for the respective object of the automation object can be selected.

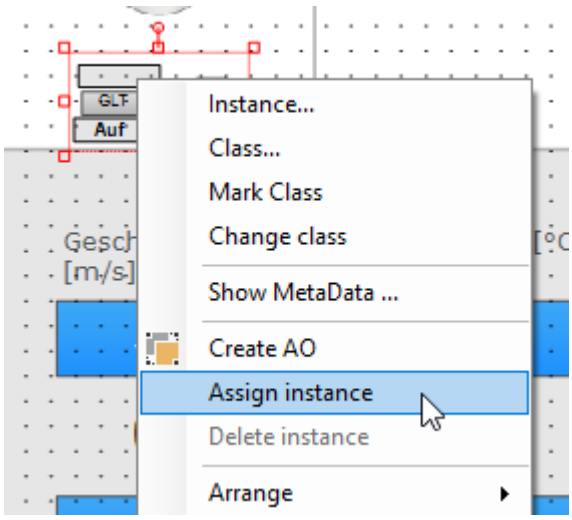


Fig. 58 Instance assignment

After closing the class dialogue, the "Automation Objects" view is switched in the Properties window or in the Dynamics dialogue. The option "Assign instance" opens a dialogue in which the corresponding instance for the AO can be selected.

This automatically assigns the process variables that point to the structure instance object to the automation object.

To be able to assign process variables despite this structure assignment, the "SHIFT" key is pressed during the selection. This opens the process variable selection dialogue instead of the instance selection dialogue.

9.16. Tooltips

In PROCON-WEB the tooltips for objects can be managed in the Designer. Tooltips can be specified for dynamic objects and controls. The tooltip text is specified in the instance dialogue under Display.

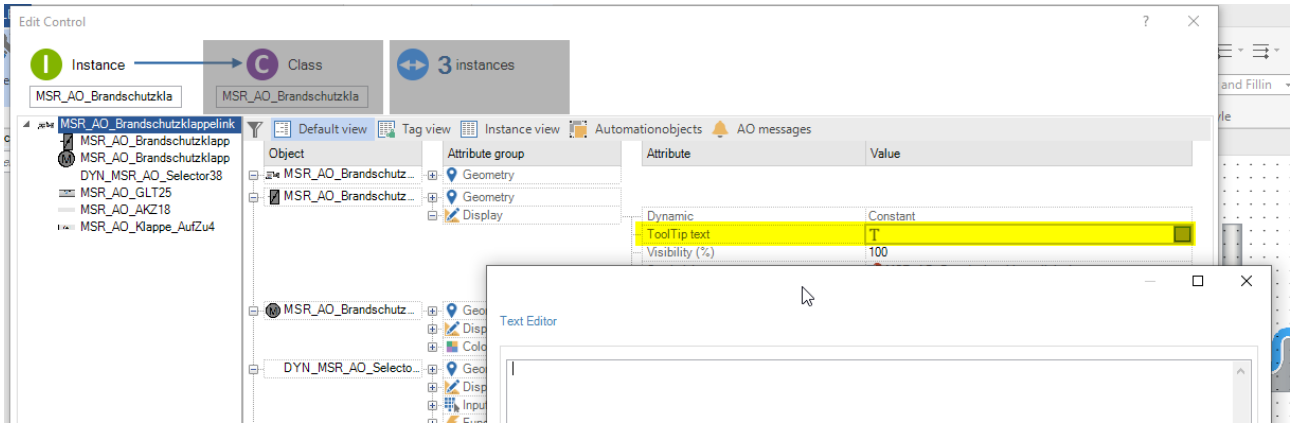


Fig. 59 Assign tooltip text for button

INFORMATION

Tooltips can be assigned in multiple languages. See also Text-Import/Export.

Using the special functions 422 and 423, all tooltips available in the picture can also be displayed or hidden. This can be particularly advantageous for touch surfaces (in the sense of a help function).

9.17. To create an input/output field of a process value

In the "Picture Editing" ribbon tab of the picture montage, open the element for number fields and select "Numeric digit".

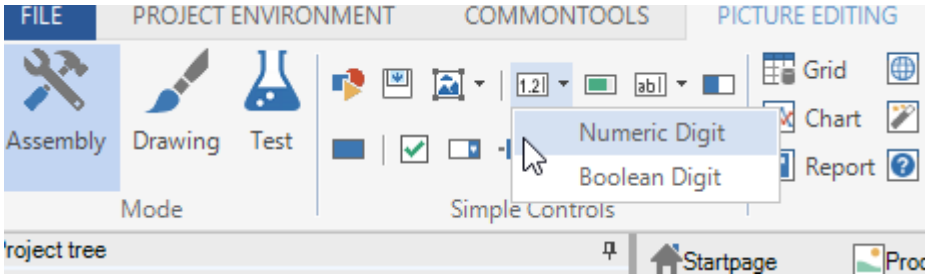


Fig. 60 Elements of picture montage

The type of dialogue for the numeric number field object opens. Here, number field objects with different functionalities can be defined. Since PROCON-WEB has an object-oriented structure, it is usually sufficient to create a number field object with certain functions and then use it e.g., for the inputs and outputs of several process variables.

INFORMATION

The number field object dialogue can also be opened via number fields available in process screens (select the number field in the picture select right mouse button and call "Type" in the context menu).

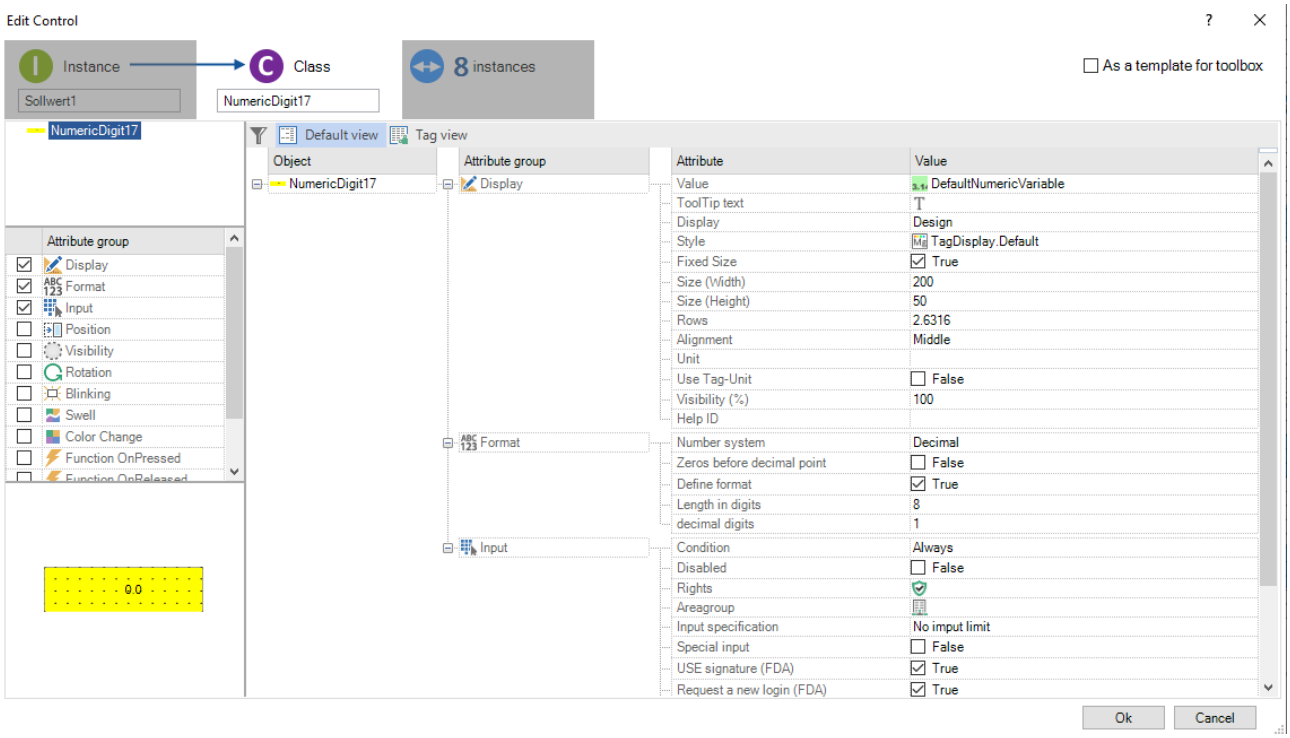


Fig. 61 Edit number field

The name assignment can be made in the upper area of the dialogue. Here "Numeric Input" should be entered

Apply settings with "Ok"

The number field object appears in the upper left corner of the picture and can then be positioned as desired.

the attributes of the instance are configured in the properties window

In the value assignment, a default process variable "DefaultNumericVariable" is always displayed.

By selecting the button in the "Value" row, column "Value" in the Display field, the dialogue for process variable selection appears

A process variable for the number field object can be selected here. PROCON-WEB distinguishes between numeric and logical process variables. Since this number field object is parameterized for numeric values, only the selection of numeric values is displayed. In the dialogue, the "DefaultNumericVariable" and the "NumVar01", which has been declared in the chapter "How to create a process value with coupling", are displayed. In this dialogue as well as in the process variable editor (see chapter "How to define a process value with coupling") process variables can be declared.

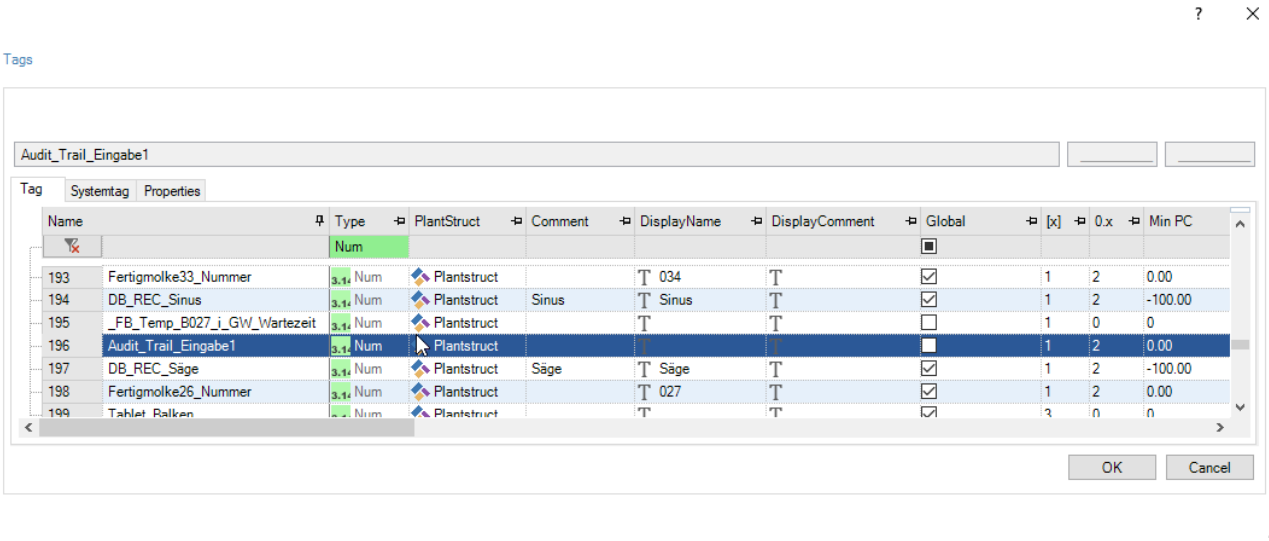


Fig. 62 Selection of variables

Select "Test variable" and confirm with "OK"

9.18. How to draw symbols

In the PROCON-WEB Designer, the drawing of symbols can be started in two ways in picture montage:

- Using the Draw button in the Picture Editing ribbon tab
- By selecting one of the character primitives, also in the ribbon tab "Picture Editing"

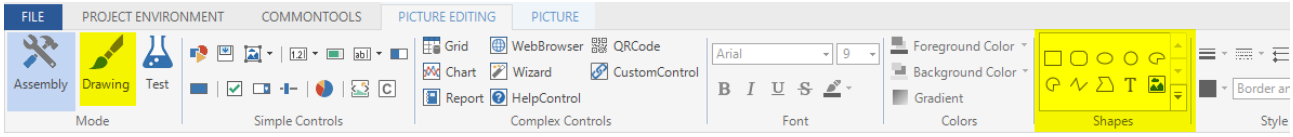


Fig. 63 Zeichenmodus starten

This automatically switches from image montage to drawing mode.

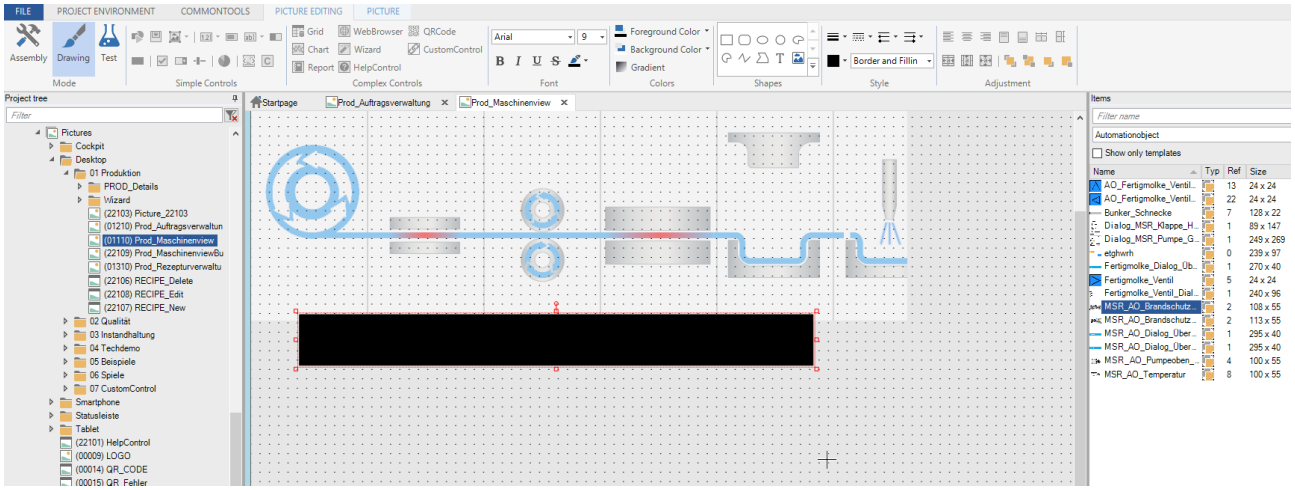


Fig. 64 Drawing mode

- In the Shapes Toolbox, select "Rectangle" in drawing mode and draw a rectangle in the work area.
- Saving is done via the button "Drawing mode" or via the context menu of the right mouse on the symbol with "Apply as". This opens the following dialogue

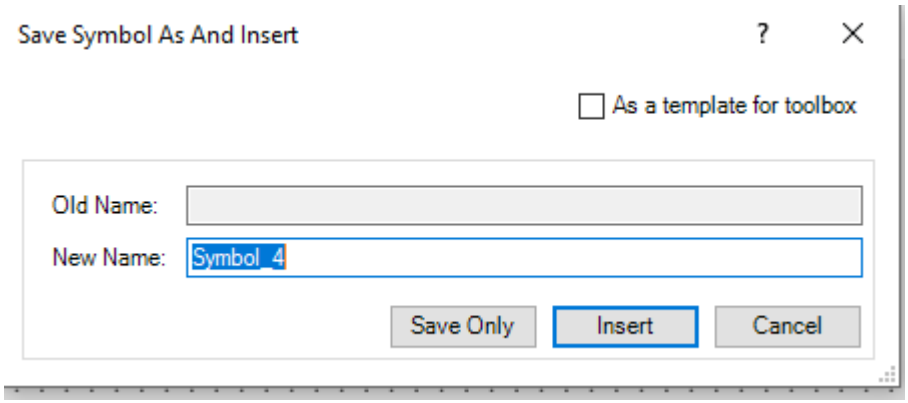


Fig. 65 Save symbol as

In the "Save as and Insert" dialogue, the symbol is saved by confirming with "Apply" and transferred directly to the picture.

INFORMATION

saving the icon terminates drawing mode and the user is back in picture mounting mode.

In assembly mode, the process picture is compiled from symbols, number fields, bar displays, controls, etc.

INFORMATION

If a symbol is selected in the picture in montage mode and then switched to drawing mode, it can be edited in drawing mode. it should be noted that each instance of the symbol is changed by editing.

9.19. How to import pictures and bitmaps

In PROCON-WEB Designer, pictures or bitmaps can be imported in two ways:

- In the picture montage in the ribbon tab "Picture" via the button "Bitmap Management"
- In character mode via the character primitive "Picture"

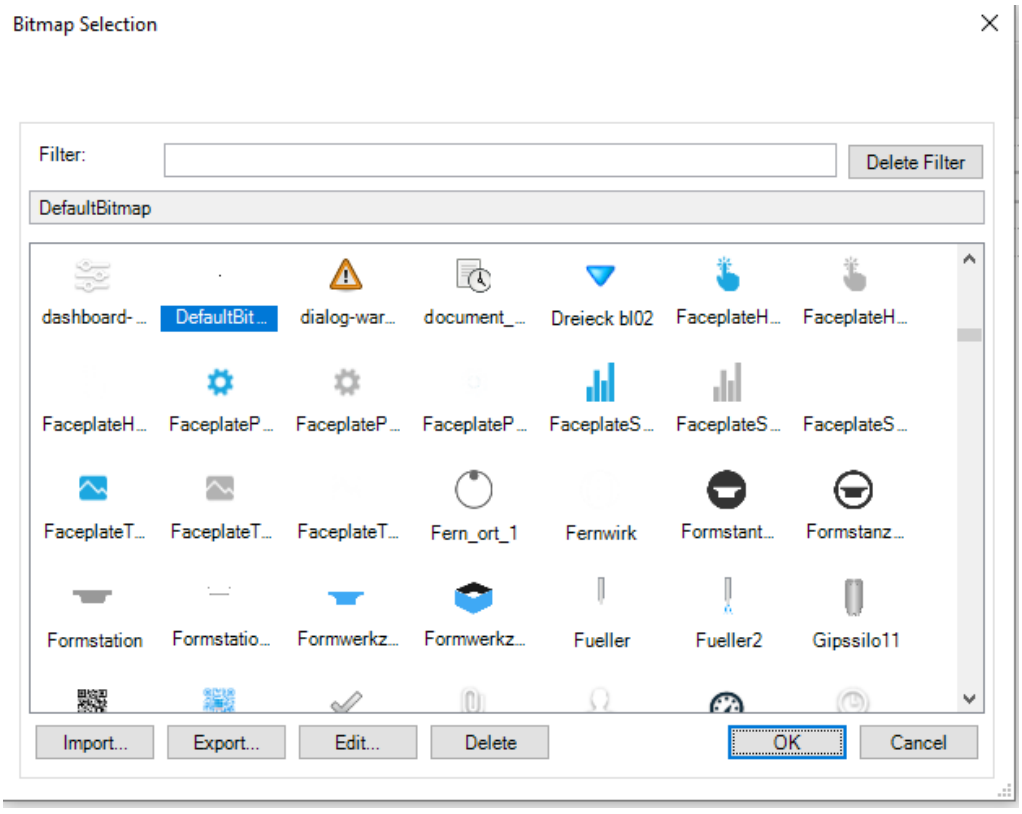


Fig. 66 Bitmap selection

The following steps must then be performed:

- Select "Import" in the "Bitmap Selection" dialogue
- In the "Import Bitmaps" dialogue, select the graphic to be imported and import it with "Open".
- Graphics can be imported in the following file formats:
  - Bitmap (*.bmp)
  - Icon (*.ico)
  - Gif (*.gif), also animated
  - Tiff (*.tif)
  - JPEG (*.jpg)
  - PNG (*.png)
  - SVG (*.svg)

9.20. How to dynamize symbols

The following section uses the rectangle symbol drawn to define a symbol object with the Colour Change property. By selecting the symbol object in the runtime (browser), the colour of the symbol changes.

- Select the "Rectangle" icon with the mouse in the picture
- Selecting the selected symbol with the right mouse button opens a context menu.
- Select "Dynamic Symbol" from the "Dynamize" context menu.

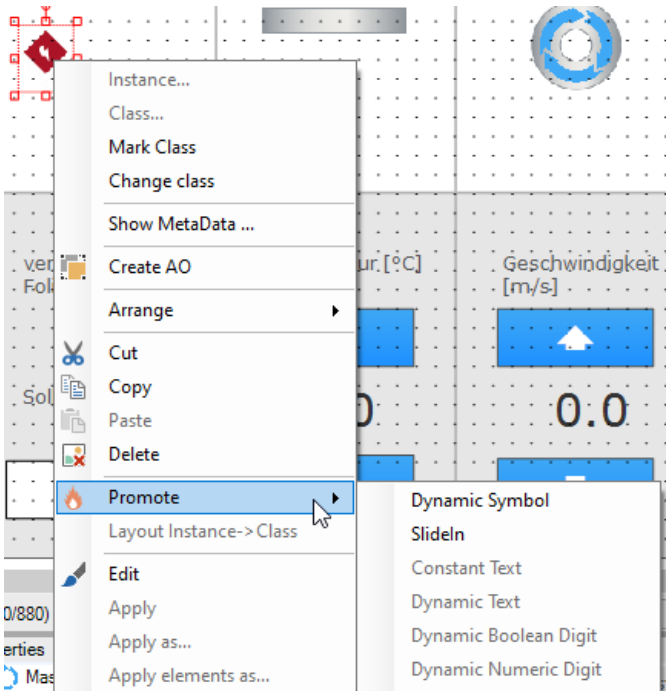


Fig. 67 Dynamize a Symbol

This allows symbol objects with different functionalities to be defined.

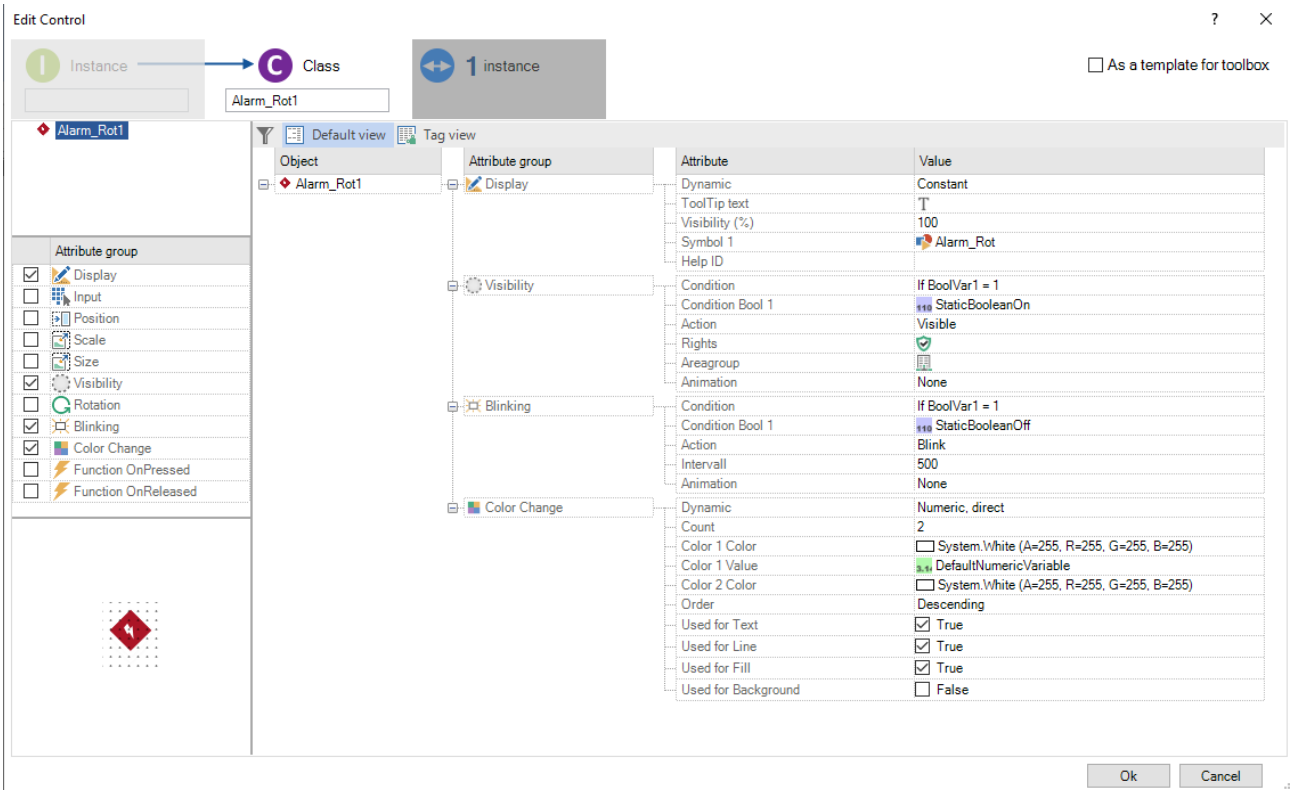


Fig. 68 Class-Instance Dialogue dynamic Symbol

- Select the "Input" checkbox
- All other settings for input can be left as follows
- Select the "Colour" checkbox
- In the dialogue in the "Dynamics" line, set the value to "Logical Area"
- Under "Colour 1" and "Colour 2" the colours can be set via the selection button, e.B. red and blue
- Leave "Colour by Fill" checked only
- Select the "Function" checkbox
- Under Action, select Logical: Invert Log1

Then end the class instance dialogue with "Ok". The settings are applied automatically.

9.21. Special functions

Special functions can be triggered from the event code, via symbols, texts and function keys. Special functions are successively replaced by self-explanatory function calls. Even special functions are not fully available for all server variants!

To start a specific special function, the corresponding special function number must be assigned as a parameter or selected via the special function selection.

Available special functions:

203	Log in user
204	Change user password
205	Log off user
206	Call the user administration
401	Exit user interface
413	Restart the user interface
420	Show help buttons
422	Show all tooltips
423	Hide all tooltips
430	Show Inspector
431	Open the device mapping dialogue
1253	Go to the Language Switch window
6xxx	Call up picture xxx as an additional dialogue
6999	Close current dialogue Attention: Picture = Picture to be closed
7xxx	switch to picture xxx

9.22. Selection of special functions

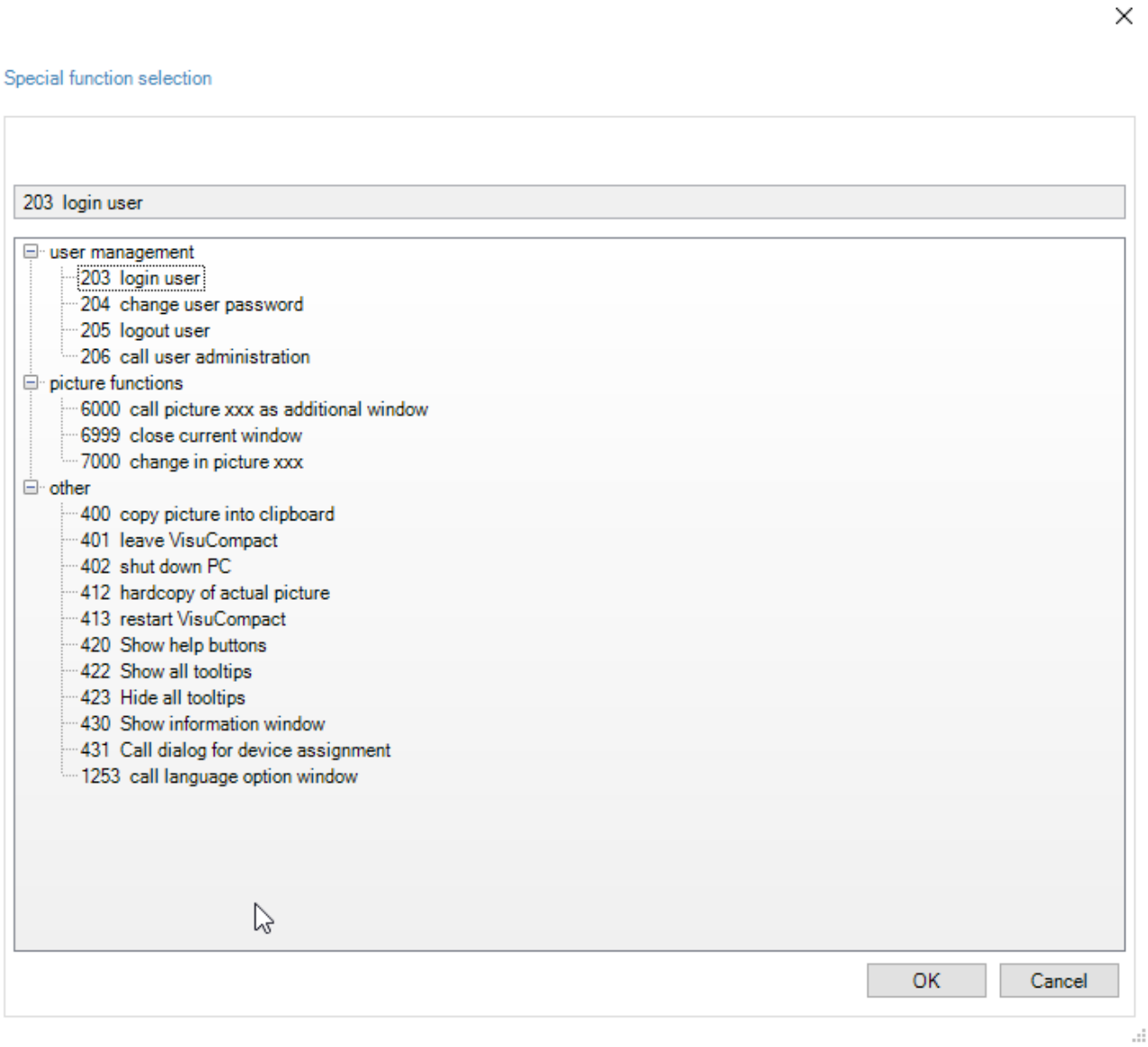


Fig. 69 Selection of special functions

At all points in the Designer where special functions have to be entered or specified, this selection window can be opened by the right mouse button. By mouse click a special function is selected and with the 'OK' button the selection is taken over.

9.23. Styleguide

PROCON-WEB enables a uniform basic design with the help of a style guide. This makes it possible to define different styles for selected controls. This ensures a permanent overview and control over the consistency in the project.

First, the world of colours is determined. Later styles will fall back on this world of colours.

Texts and controls can be specifically influenced in their kind and defined as style. A project can contain indefinite numbers of styles (as needed).

10. Layouts, Views, Configuration and Navigation

In addition to the classic variant of building a surface from interlinked full frames, PROCON-WEB supports a concept in which a generally valid picture structure is predefined in the form of a layout whose areas record the actual picture content as containers. The pictures are not individually defined and linked to each other, but only picture contents are created, and the desired picture constellations are compiled by means of a navigation table.

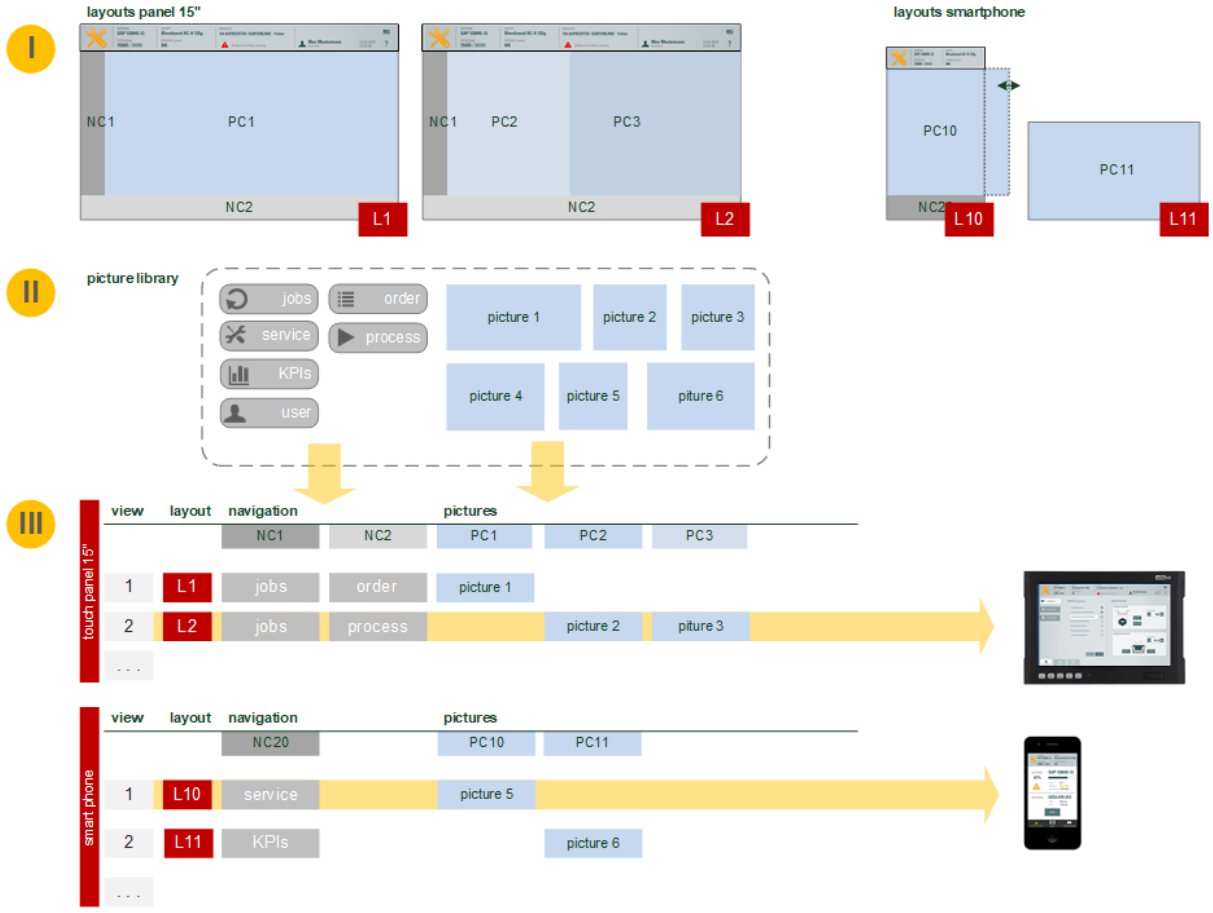


Fig. 70 Concept of Layout, Configuration & Navigation

The figure shows the concept of layout and containers with configured navigation:

- For each device type (most of which can be detected automatically), one or more layouts are created. These structure the picture structure, like what you know from a website.
- The structure of the layout results from the containers introduced there, which can either mark picture or navigation areas and later record the appropriate elements.
- Picture elements, e.g., for a status line – which should be the same for all pictures – can be inserted directly into the layout picture.
- The navigation table now defines many pictures (views), each of which uses one of the device-specific layouts, name the navigation elements necessary to select the picture and then define the corresponding content for the navigation containers.

What is the benefit of this approach, which is more administratively complex than conventionally linked individual pictures?

- A uniform picture structure is used throughout the project
- By separating picture content and navigation, existing pictures can be used in different contexts and for different end devices (because containers scale)
- The creation of a new machine variant with a few different pictures is much easier to carry out, because only the entries in the navigation table have to be adapted and the complete navigation is updated

10.1. General

The layouts, also called layout variants, are required for navigation. Together with the containers, they represent a basic structure for the view.

In the configuration of the view, it is defined how the later overall picture is constructed from the individual elements. The selection of the views in the runtime is done via the navigation.

HINT

If a smartphone view has been configured in the project, it can also be checked on the PC without a smartphone. The smartphone view can be accessed via the following link: http://localhost/index_smartphone.htm

10.2. Layouts and Container

Layouts are the basis for the overview and navigation concept. A layout defines, among other things, via containers where the partial pictures are positioned in the overall picture.

A layout picture can contain multiple layouts, a container can be assigned to multiple layouts. For example, you only must define a container for a status bar once and can use it in several layouts.

HINT

As soon as a picture contains a container, it moves in the project tree under the node Start -/ Layout Pictures.

If a container is dragged into a picture, a layout variant is automatically created if there is none in the picture yet.

When a container is dragged into a picture, it is automatically assigned to the first layout.

10.3. Configuration & Navigation

Under "Configuration & Navigation" the navigation and thus also the configuration of the view of the project is defined.

The navigation can be created globally for all end devices, or if necessary, separately by device classes or for a specific device. Different views can also be created for a normal or rotated orientation of the device.

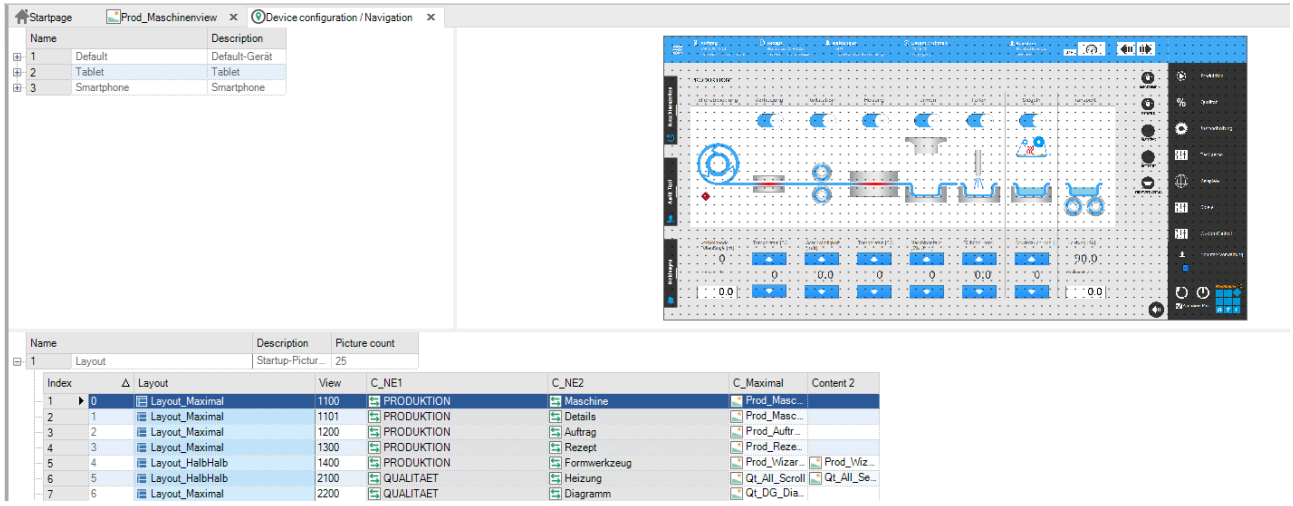


Fig. 71 Configuration & Navigation

In addition to creating the displays in the navigation grid (see Layout - Configuration Example), the preview at the top right also allows visual navigation through the project. This means that by clicking on the navigation elements in the picture, the corresponding navigation is carried out and the view is switched. When you click into the picture, the corresponding container is also marked in the grid.

Double-clicking on a location in the preview opens the underlying picture in the picture montage.

If the "Highlight Container" option is activated, the currently selected container in the grid is highlighted in colour in the preview.

10.4. Layout - Project planning example

10.5. Creating Container

A container is created via the ribbon tab "Picture Editing".

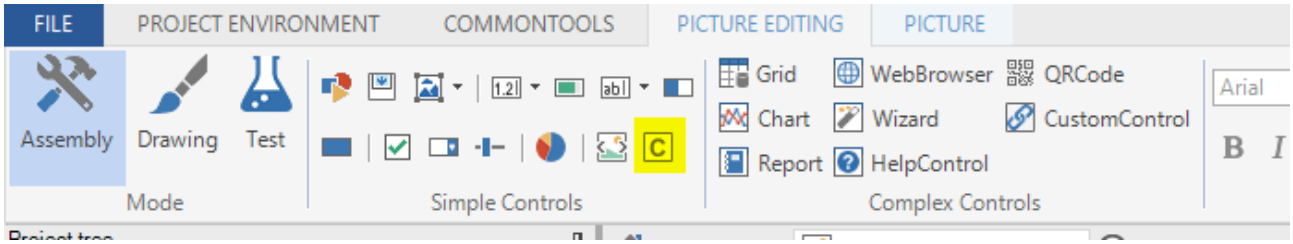


Fig. 72 Create a container

For example, the first container is to become a vertical navigation container. The container is now named accordingly and dragged to the left side. It is supposed to represent the first level of navigation, that is, it is the main navigation.

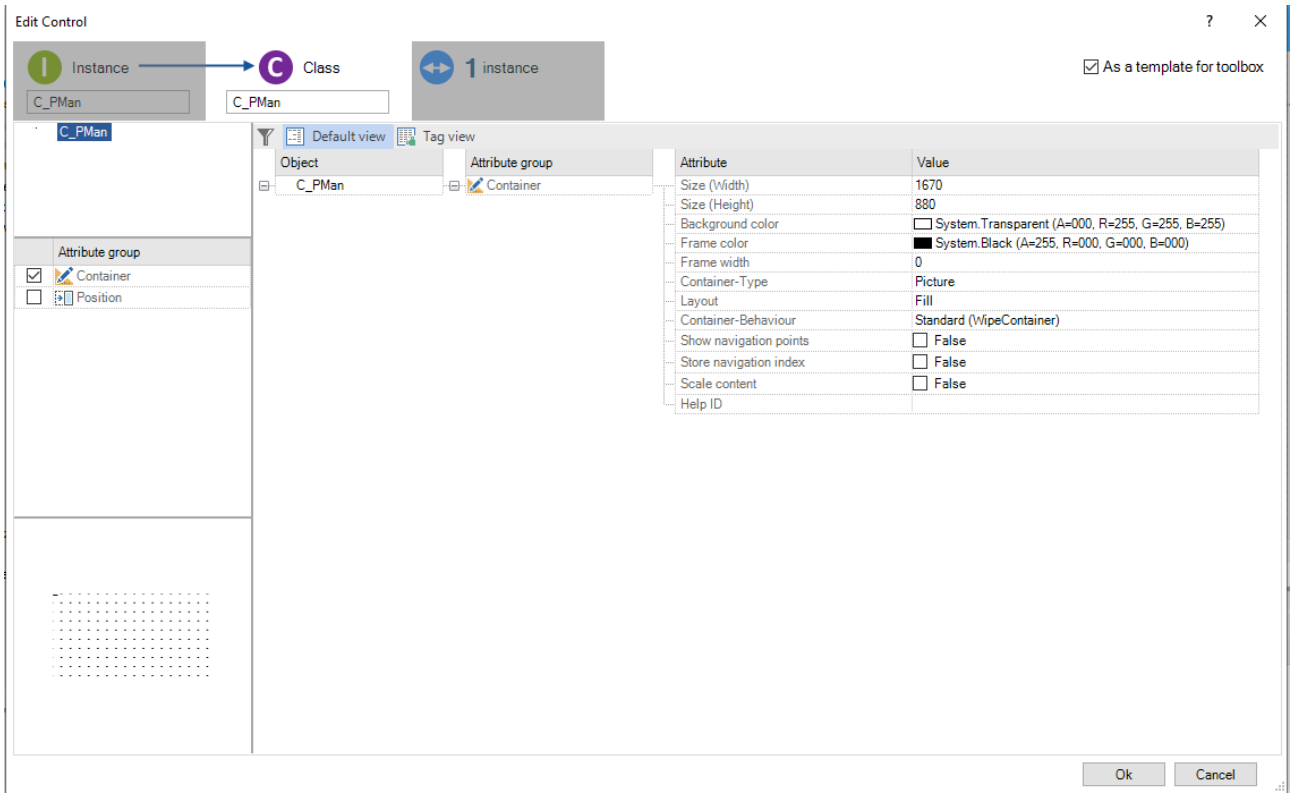


Fig. 73 Settings from the container in the class

In the class dialogue, the container type is changed to "Navigation" and a 1 is entered in the navigation level.

The distance between the navigation elements in the container can be determined by the distance.

Now a second container with the container type "Navigation" is created and arranged as a second navigation level in the horizontal area in the upper right of the vertical navigation. This second navigation will be able to change its displayed content depending on the selection in the 1st navigation level.

Finally, an picture container is created, which can change its content depending on the selection in the navigations. This fills the area below the horizontal navigation. For this purpose, "Picture" is selected in the container type. For the picture container, the "Arrangement" "Filled" is selected, because the picture should be visible in its full size in the container.

The picture with the containers and possibly a logo in the upper left corner could then look like this:

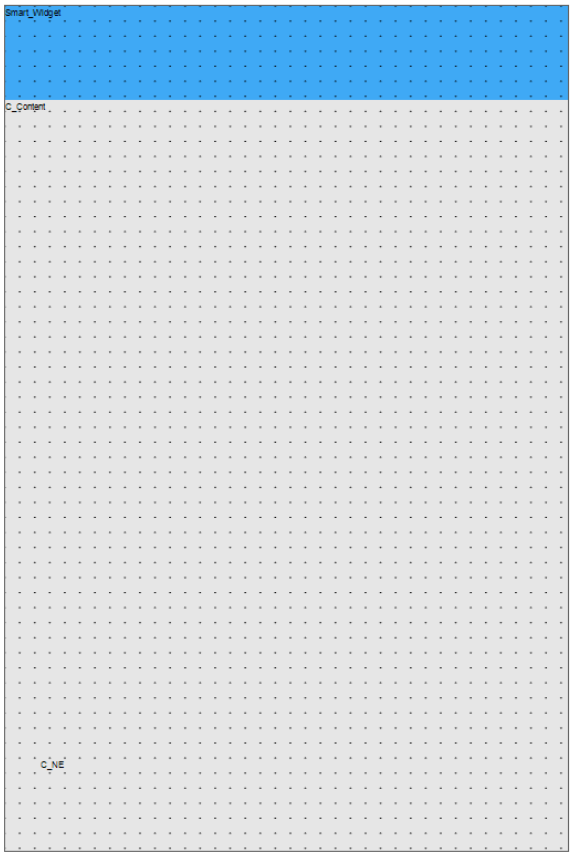


Fig. 74 Example Layout

10.6. Creating new layouts

Often it may be necessary to divide the content displayed on the screen differently for different views. To accomplish this, you can define further layout variants.

For this purpose, further picture containers are first defined, as described in the previous chapter. In our example, two additional picture containers are created, which lie next to each other and are each half as wide as the first picture container.

Creating, deleting, or copying layout variants is done via the context menu on the picture.

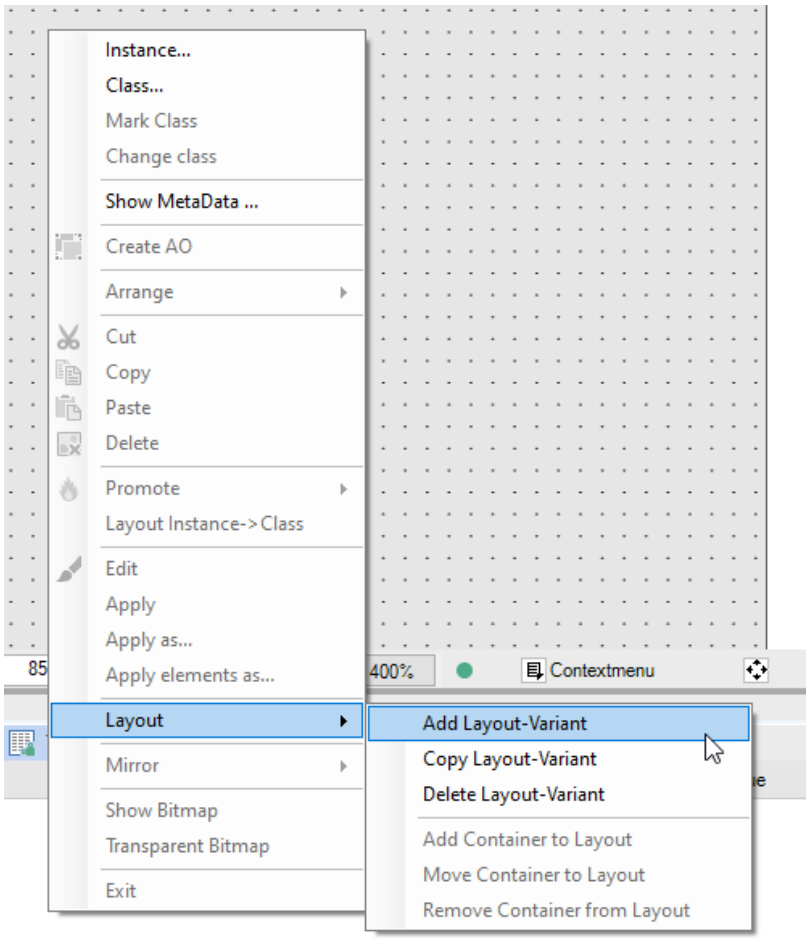


Fig. 75 Create a new layout-variant

When this is done, the layout can be given a different name via the properties window.

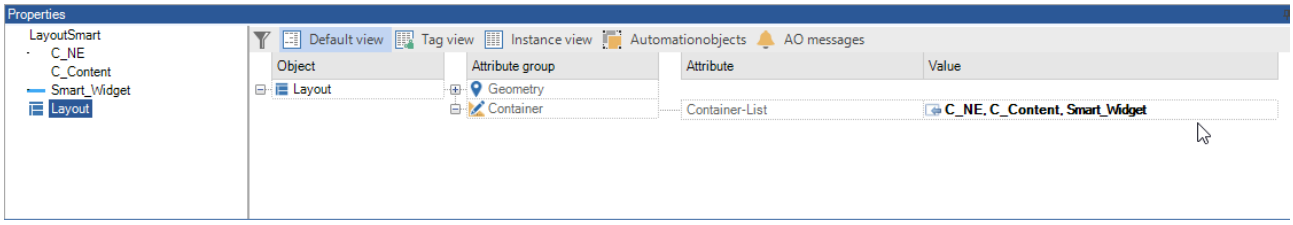


Fig. 76 A new Layout-Variant in the Properties window

The containers can now be selected and added to the layout via the dialogue of the "Instance Value" field.

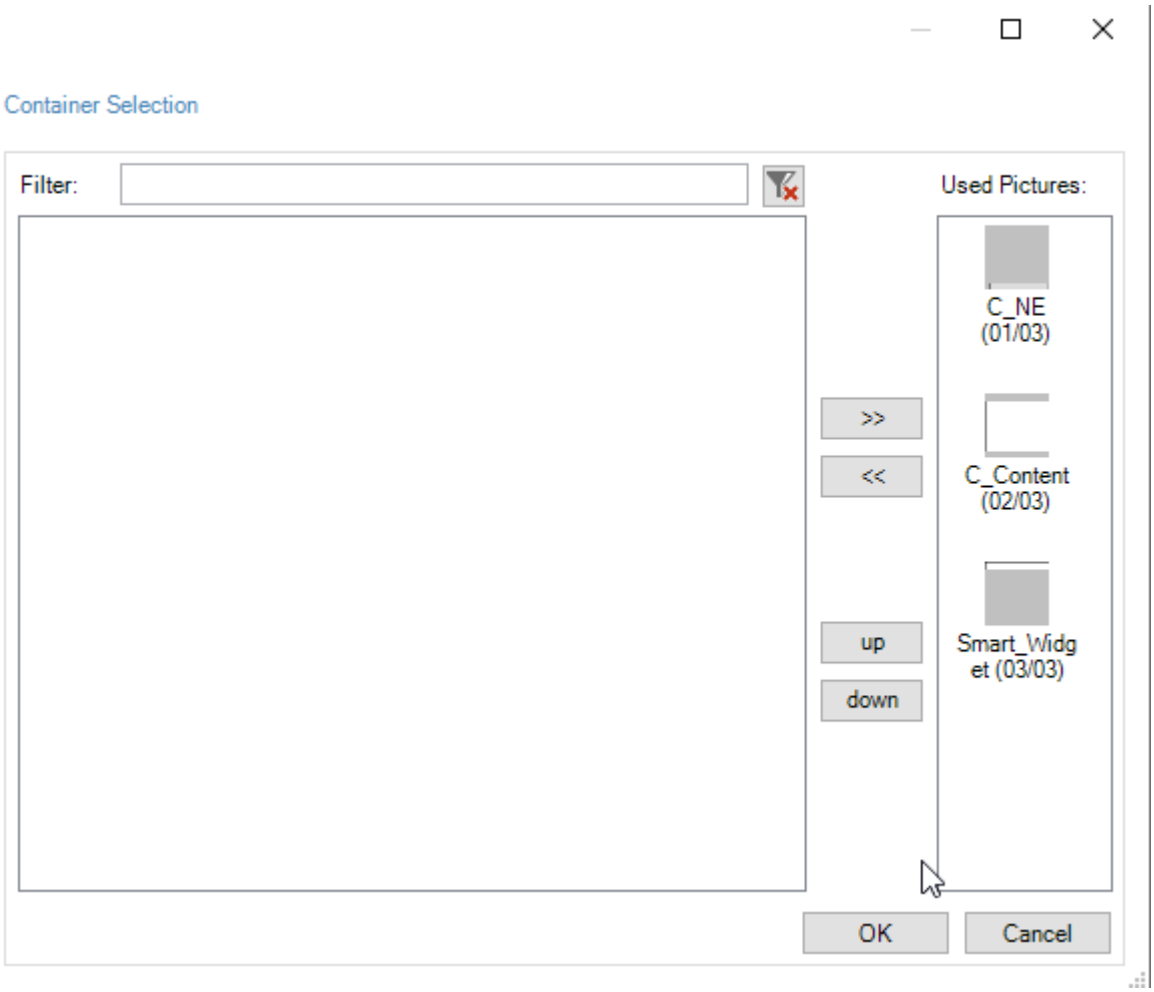


Fig. 77 Added containers to the Layout

On the right side of the toolbox, the individual layouts can be switched visibly and invisibly via the Layouts tab to be able to check them better.

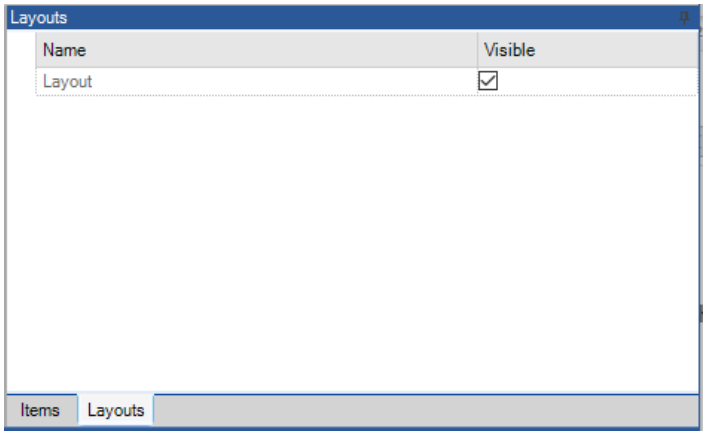


Fig. 78 The layout tab to check the Layouts

10.7. Creating pictures

Before you can finally start with the definition of the navigation, some pictures have to be created that later fill the containers.

In the example, the simplest possible pictures are created here to represent the principle of navigation.

First, two navigation elements (pictures) are created for the main navigation and two navigation elements for the sub navigation. These each have the large 100x100 with a static text in the middle.

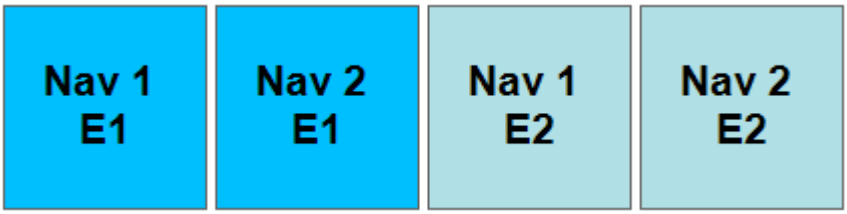


Fig. 79 Example for navigation elements

Then the pictures for the picture containers are created in the appropriate size.

10.8. Creating a Navigation

To be able to create a new navigation, "Configuration & Navigation" must first be opened in the project tree.

This area is divided in such a way that you can create a separate navigation for different types of devices (standard, tablet, smartphone, ...), which is adapted for this device. Only for the device type Standard, you have the possibility to configure a touch input. In addition, the layouts can be defined separately according to "normal" and "rotated".

The different device types can be defined and adapted in the upper left area.

On the upper right side, the preview of the selected view of the navigation is displayed.

The table below defines the actual navigation.

A new navigation can be created via the context menu of the first line in the lower area

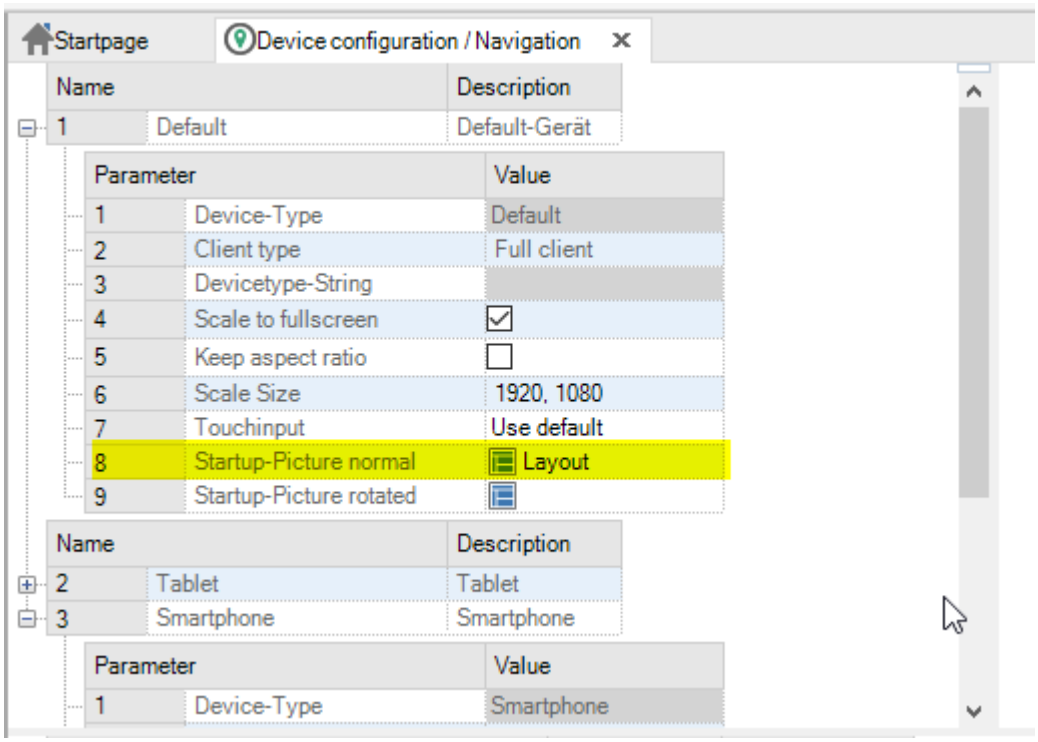


Fig. 80 Create a new Navigation

If a layout is defined for the device type in the selected start screen, a layout is selected in the next step.

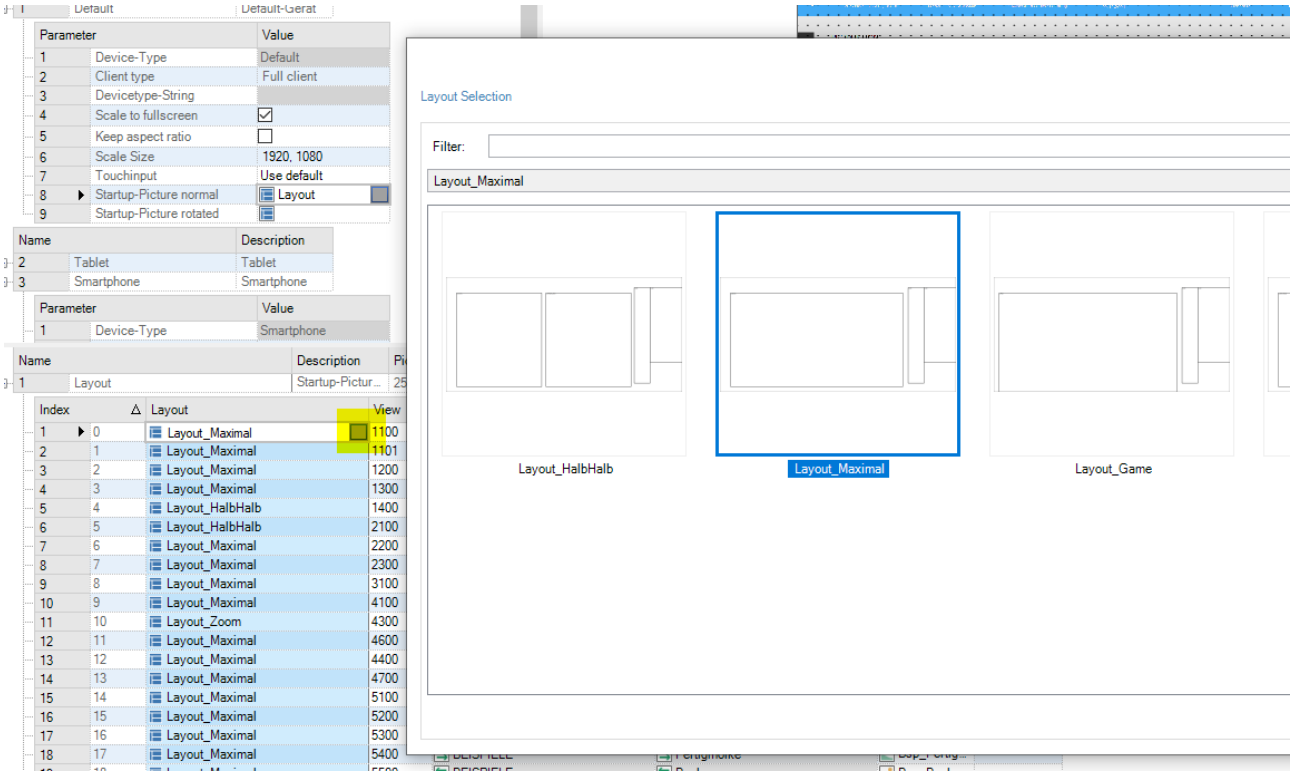
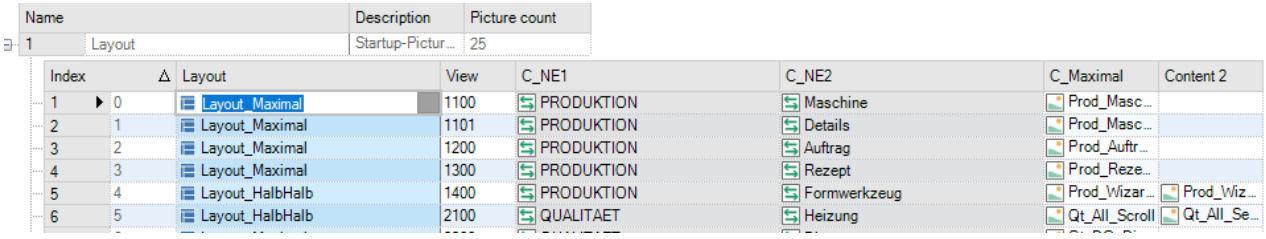


Fig. 81 Select Layout

The lower grid is then built based on the information and containers found in the layout. Among other things, the names of the containers are entered as a column heading.

In the next step, the containers "C_NE" and "C_Content" are filled with the corresponding pictures. For each view, a separate line is defined via "New Navigation".

The preview at the top right is updated according to the selected view and filled containers.



Name		Description	Picture count
1	Layout	Startup-Pictur...	25

Index	Layout	View	C_NE1	C_NE2	C_Maximal	Content 2
1	0 Layout_Maximal	1100	PRODUKTION	Maschine	Prod_Masc...	
2	1 Layout_Maximal	1101	PRODUKTION	Details	Prod_Masc...	
3	2 Layout_Maximal	1200	PRODUKTION	Auftrag	Prod_Auftr...	
4	3 Layout_Maximal	1300	PRODUKTION	Rezept	Prod_Reze...	
5	4 Layout_HalbHalb	1400	PRODUKTION	Formwerkzeug	Prod_Wizar...	Prod_Wiz...
6	5 Layout_HalbHalb	2100	QUALITAET	Heizung	Qt_All_Scroll	Qt_All_Se...

Fig. 82 Layout in Navigation

In our example, three pages with the different layouts are now defined and filled.

The order is determined by the index of the navigation elements and thus also the appearance of the displays.

Changes to the order can be achieved by moving the context menu, or by moving the entire row in the table.

10.9. Creating a new device class

To be able to assign device-specific layouts, a separate device class must be defined for this purpose, which can then be used to identify the devices that are to receive this layout.

For unique identification, the field "Device-specific text" must be filled in such a way that a corresponding assignment can be made. This is possible via the so-called UserAgent of the browser. Accordingly, layouts can be selected depending on a browser.

For this purpose, the browser name must be entered as device-specific text.

Your own UserAgent can be read out via various websites. Here are some examples:

- Firefox: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:81.0) Gecko/20100101 Firefox/81.0
- Chrome: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/85.0.4183.121 Safari/537.36
- Edge: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/86.0.4240.75 Safari/537.36 Edg/86.0.622.38

Since both Chrome and Edge browsers contain the term "Chrome", this assigned layout is used in both browsers. Firefox or Opera would use the Default class. If you only want to use Chrome and not Edge, the Edge must be excluded via a so-called regular expression: "(Chrome)(?! *(Edge))"

11. Scripting

11.1. Task of the Scripts

PROCON-WEB allows you to edit scripts in parallel with the ongoing visualization.

These formulas do not represent a control substitute, but mainly cover the following tasks:

- Support of visualization by processing process data (e.g. generating summarized status information)
- Supplementary-controlled processing of complex functions (e.g data acquisition, messages, picture changes, calculations)
- Simulation of processes by changing internal quantities
- Plausibility checks over several dependent setpoints
- Time-controlled editing of functions
- Calling up your own high-level language programs

11.2. Types of scripts in the project

There are three different types of script execution at PROCON-WEB:

- Tasks that are processed cyclically at runtime (e.g., Global Script).
- Picture-specific scripts that are processed cyclically at picture display time
- Scripts that open and close picture on buttons or events such as Picture.

All scripts are stored in the project database and edited in the Designer.

11.3. Create and compile the Scripts

The Designer automatically creates the Global script. Picture-oriented scripts are normal scripts that are assigned to the picture through the picture class. The scripts can be used in tasks, in pictures as picture scripts, or when opening/closing pictures.

All existing scripts in the project can be selected in the project tree in the PlugIn Script.

11.4. Create Tasks

Tasks can be used to run scripts in the ScriptServer cyclically or event driven.

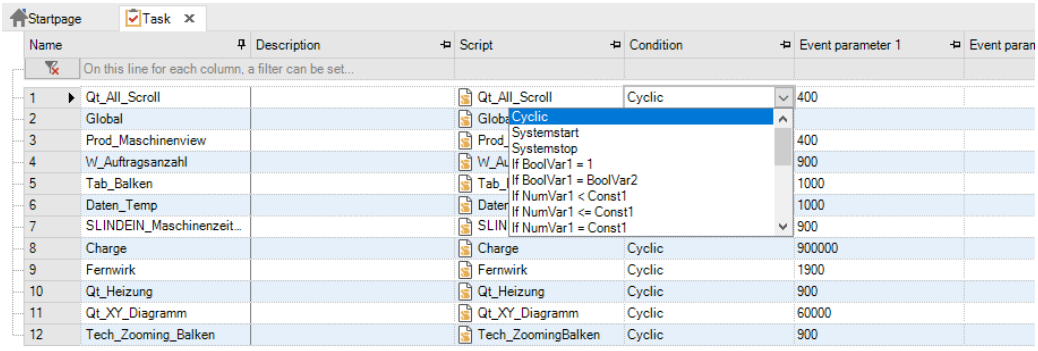


Fig. 83 Create Runtime

A task requires a name, optionally a description, and a script to run this task.

11.5. Behavior of script-specific variables between calls

The value of variables defined in the VAR area at the beginning of a script is preserved between script calls. This applies to both cyclic and event-driven scripts. This means that e.g., counting such a variable by 1 with each program call really counts the variable further and further and does not start from zero every time.

The context is maintained once for Global Scripts (all defined in the task configuration in the Designer) and once per client.

Default values of script variables

- Integer and float variables have a value of 0,
- Boolean false and
- String an empty string.

12. Save and start of projects

12.1. How to save a PROCON-WEB-Project

- A project can be saved either via the ribbon tab "File" "Save Project" or via the ribbon tab "Project Environment" "Save Project".
- The project can be saved under a different name via "Save project as".

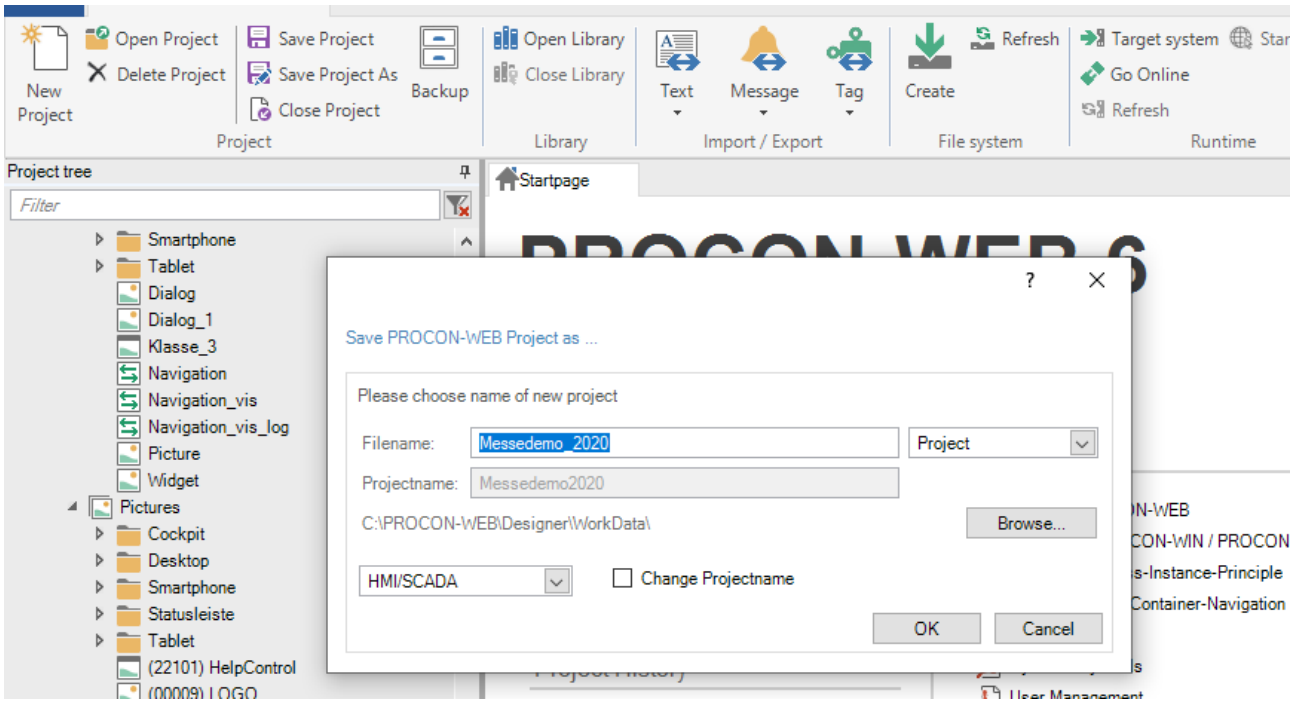


Fig. 84 Save project as

- A backup of the project can be created via "Project Environment" à"Backup"

INFORMATION

With the key combination "Ctrl" and "s" the saving can be triggered at any point in the project.

12.2. How to create the runtime environment

To open the project in the runtime system, the runtime environment must be created.

- Select "Create" in the Designer via the ribbon tab "Project Environment"
- The "Create Runtime Environment" dialogue opens

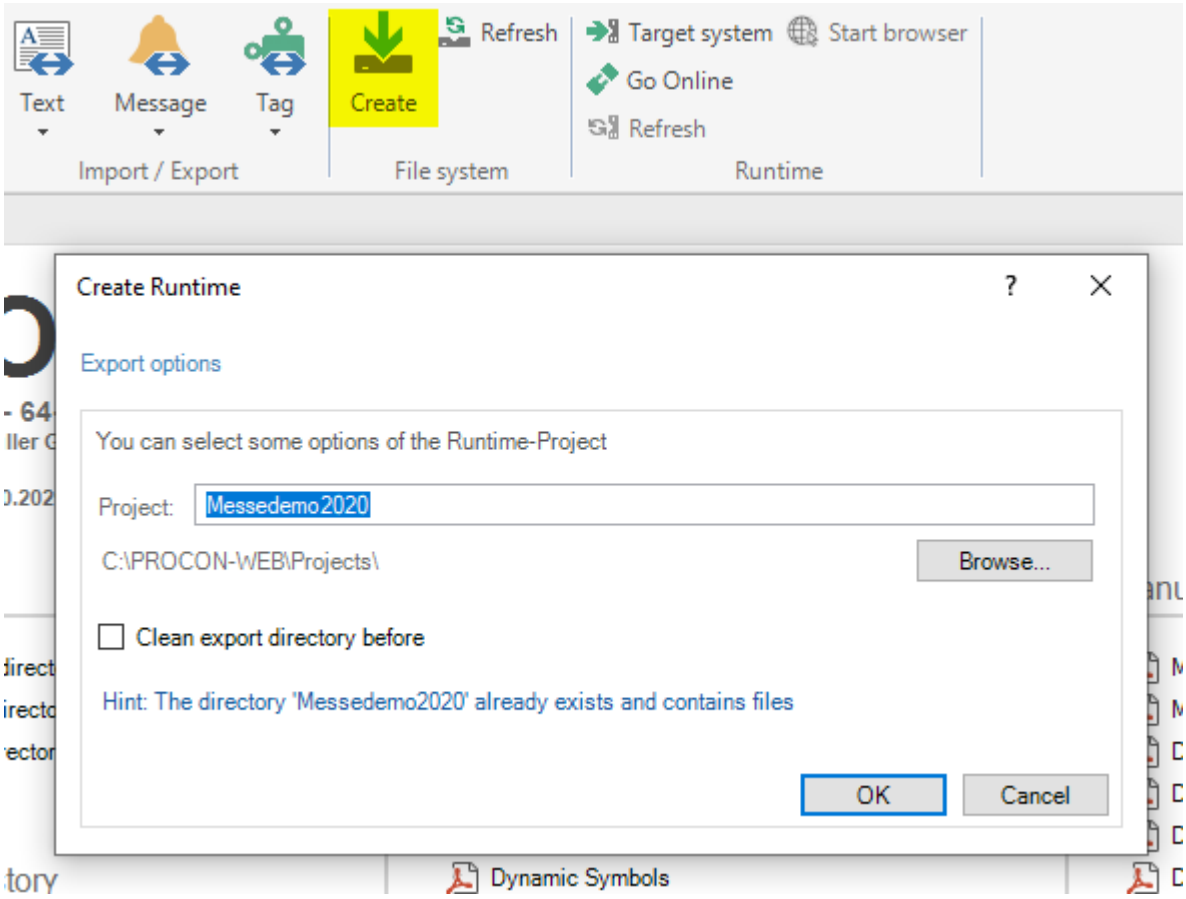


Fig. 85 Create runtime environment

Under the input field "Project" the name for the runtime project is specified. Typically, the project name of the runtime corresponds to the project name in the Designer.

The storage directory can be selected via "Browse".

By activating the checkbox, the contents of the export directory can be completely deleted. this cleans up the directory and removes outdated values.

12.3. How to start the runtime environment

On the target machine, the computer on which the PROCON-WEB services are installed, the services usually run by autostart. Thus, only the project to be started must be made known.

The project to be started is defined via the file "Project.PCS", which can be edited e.g. with the editor "Notepad". Furthermore, you can write the current project in the Project.PCS via the Designer, more about this in the chapter Coupling Designer - Runtime Environment.

INFORMATION

For the servers to process the correct project, a reboot of the servers is initiated via the SystemServer console.

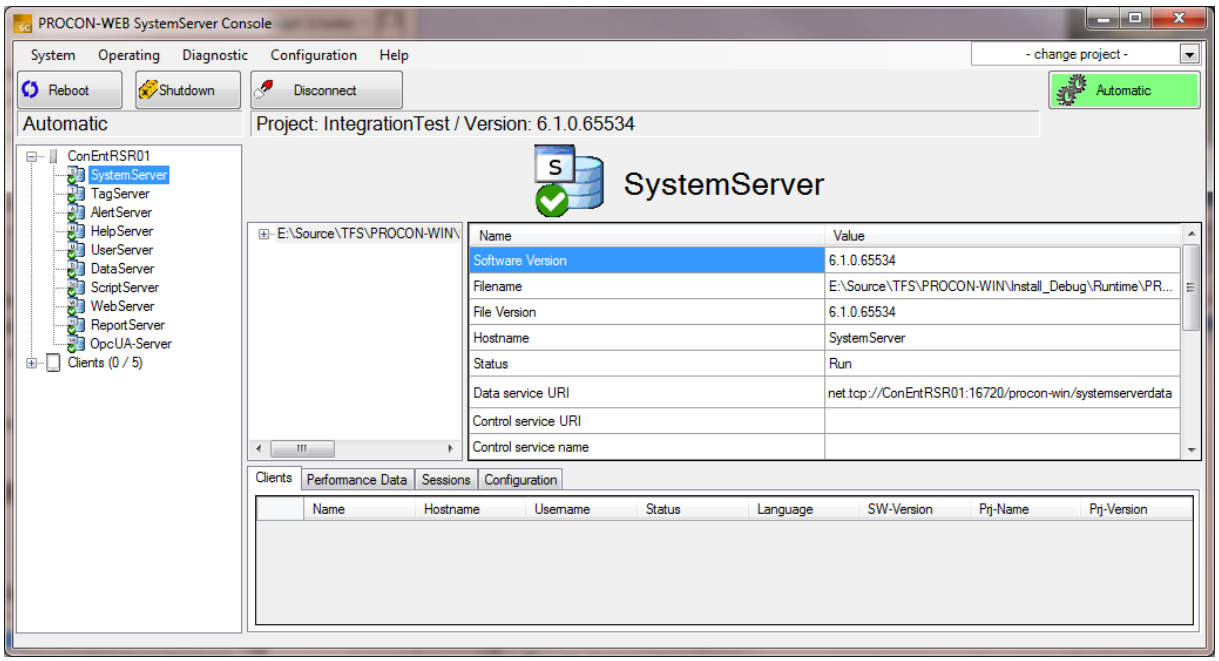


Fig. 86 SystemServer-Console

Then you can view the finished project in the browser. To do this, enter http://localhost/PROJECT-NAME/WebVisu in the address line of the local browser.

EXAMPLE

here http://localhost/

In the remote browser, http://IP-DES-SERVERS/PROJECT-NAME/WebVisu or

http://NAME-DES-SERVERS/PROJECT-NAME/WebVisu must be entered.

EXAMPLE

here http://172.16.100.3/

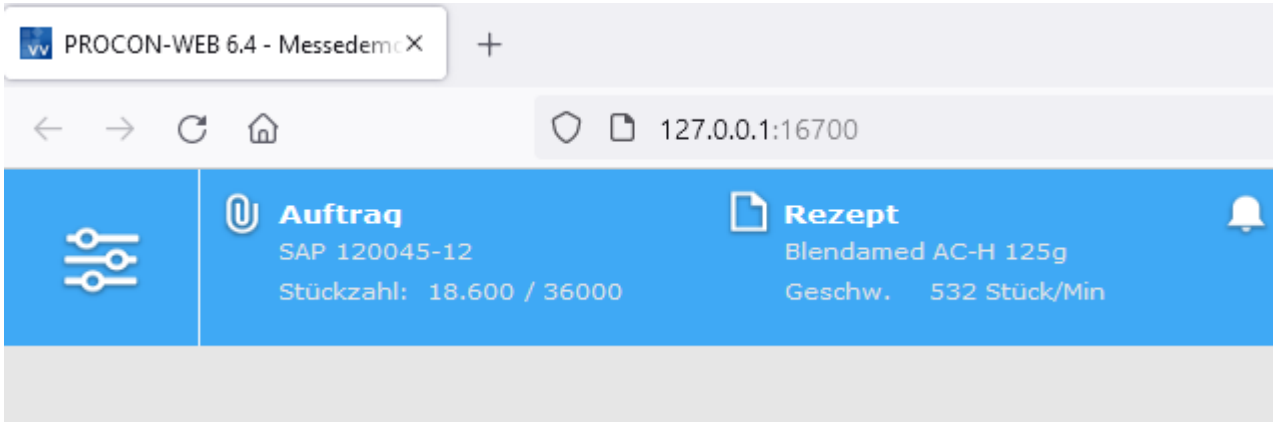


Fig. 87 Project in the Browser

12.4. Coupling Designer – Runtime

In PROCON-WEB various possibilities of coupling between Designer and server (runtime system) are possible:

- PROCON-WEB SCADA (Windows Server): Coupling via SystemServer
- Embedded targets (partial): Coupling via network search and TCP/IP communication
- Manual: Transfer of projects by hand (USB stick, ftp, ...)

12.5. Coupling via Designer to the SystemServer (SCADA)

In PROCON-WEB it is now possible for the Designer to connect to the runtime via the SystemServer. However, this is currently only possible in a local installation (Designer and server on the same computer).

The coupling is controlled via the "Runtime" area in the "Project Environment" ribbon tab:

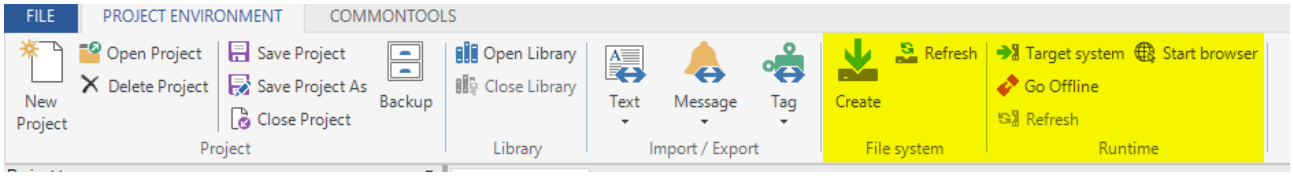


Fig. 88 Coupling Runtime environment

The coupling is initiated via the entry "Go Online". Here an attempt is made to get a coupling to the SystemServer which is entered under "Options → VisuDesigner → Options → Runtime Environment".

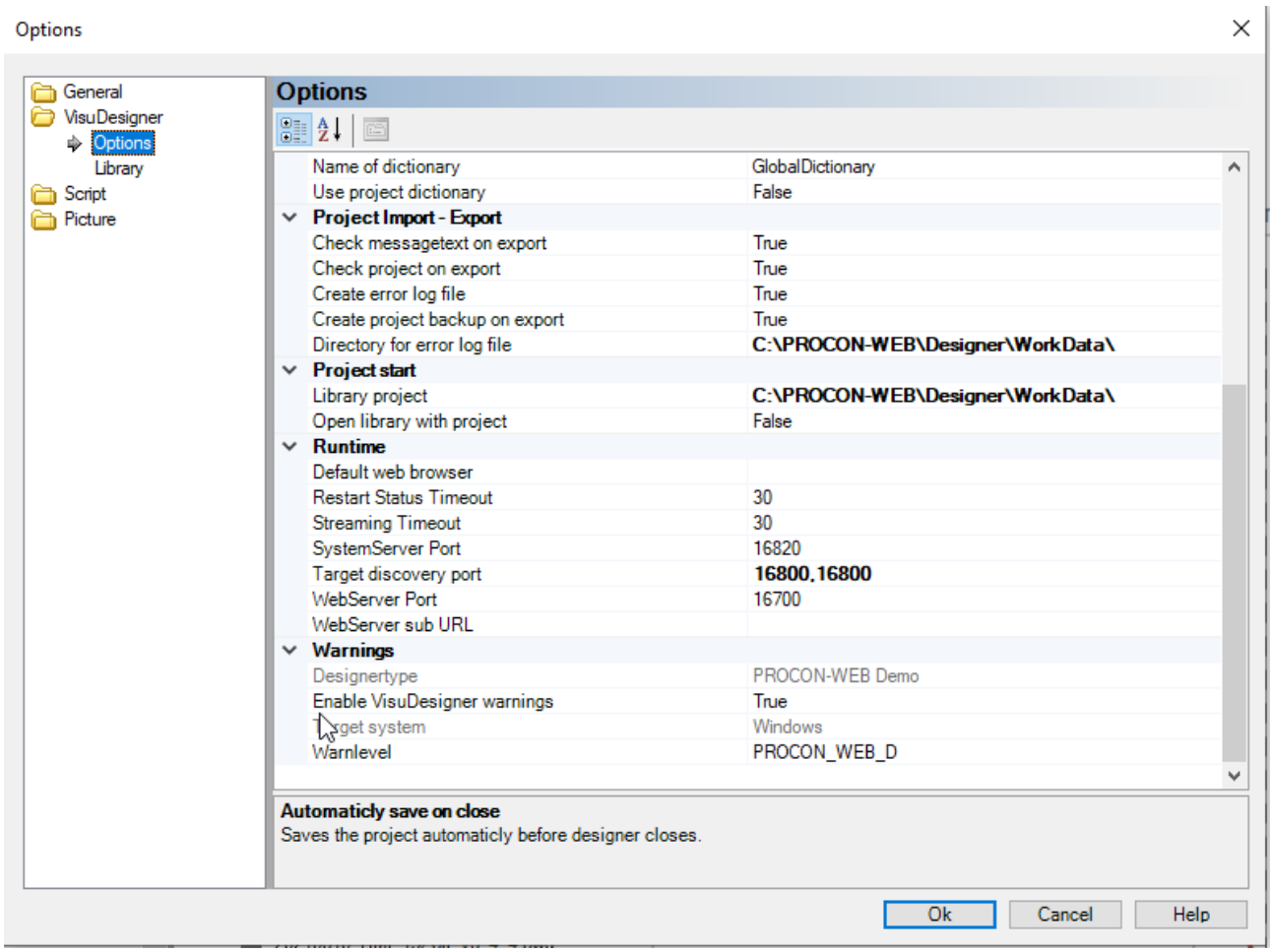


Fig. 89 Options-Dialogue

When you click on "Go Online", it is first checked whether the runtime works with the same project (status) that is also loaded in the Designer. If this is not the case, the runtime can be updated with the currently loaded project.

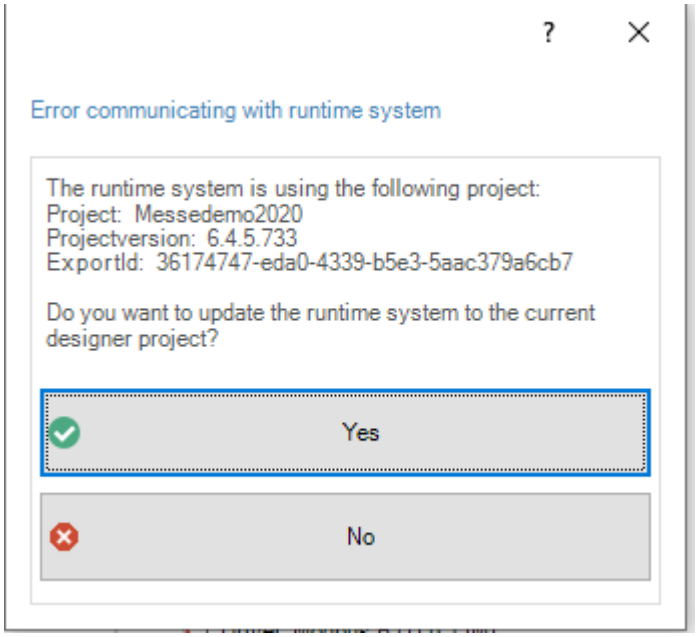


Fig. 90 Review of the Runtime project

When streaming to remote devices, it should be noted that a password must be used. Without it it does not work and there is an error message after clicking on "Go Online".

HINT

A click on "No" cancels the pairing attempt!

A click on "Yes" updates the runtime system, updates the file "Project.PCS" with the current project, reboots the runtime system and starts the browser.

Subsequently, changes made can also be transferred back to the runtime system via "Update". Again, the mechanism of updating the runtime system, rebooting the runtime system, and starting the browser takes effect.

Navigation via URL

It is also possible to call up individual pictures or views directly in the browser. The parameter "viewId" is used to call up a view created in the Navigation menu item. A check whether the user has the permission to open it does not take place.

A specific picture is called using the ID or picture name using the "picture" parameter. Again, there is no verification of user rights.

The call via the URL is as follows:

localhost/index.htm?viewId=6100

localhost/index.htm?picture=20

localhost/index.htm?picture=LOGO

With "Go Offline" the connection to the SystemServer is finally disconnected again.

12.6. Coupling via target system selection (IoT, embedded Targets)

The Designer variants for embedded targets also support (depending on the target) the possibility of online coupling via network to the target system with transmission of the project.

Selection of a target system

By default, no target system is selected. If the user tries to transfer the project via "Go Online", a locally running runtime system is searched for and used on the computer.

After pressing "Target System" in the ribbon bar (PROJECT ENVIRONMENT > section "Runtime"), the selection dialogue with all runtime systems found in the network opens.

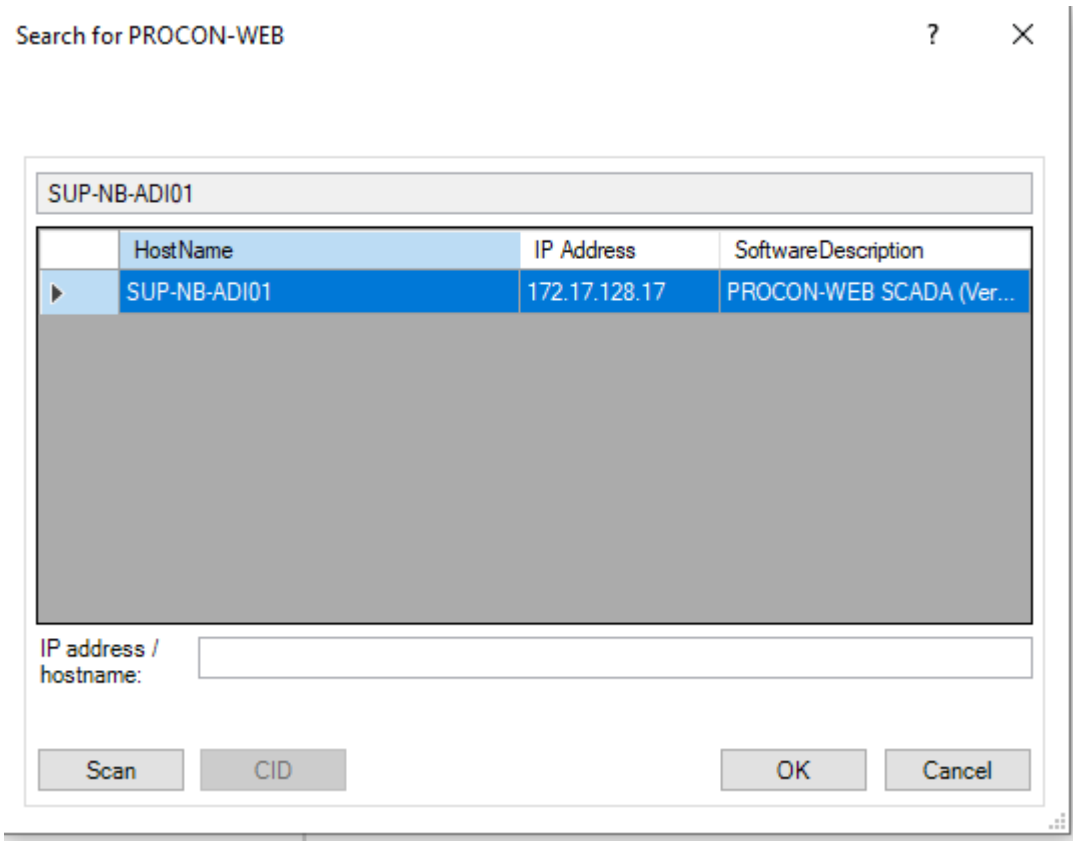


Fig. 91 Search the network for possible target systems

The selected target system is then displayed in the status bar of the Designer. The Designer remembers the selection until another project is loaded or the Designer is terminated.

Creating a CID File

A license file must be available on the target system. To be able to generate these, a "CID" file is required. This file is created in the dialogue with the selection of the target system. Either press the button "CID" after selecting a valid target system or select the item "Create CID file" directly in the context menu. It then specifies the location of the file and generates the file.

Go Online and Authenticate

After pressing "Go Online" it is checked whether the project has already been exported or which files are still to be exported.

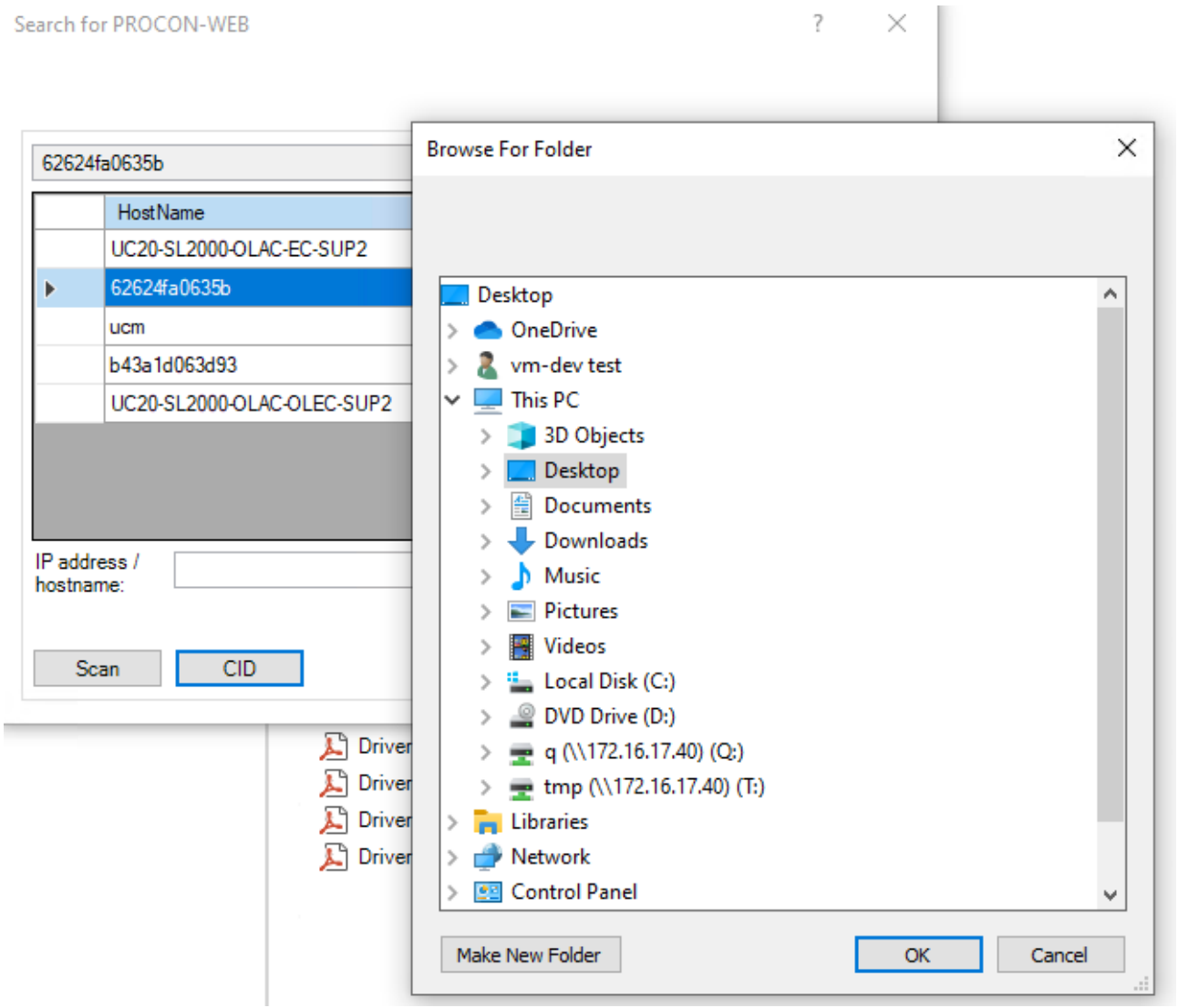


Fig. 92 Select location of CID file

The Designer then checks whether authentication is required. When using a local system, authentication is not required. On a target system in the network, the user and password are requested.

After valid input, the Designer attempts to connect to the target system. If this is successful, the Designer displays this in the "Transfer Dialogue".

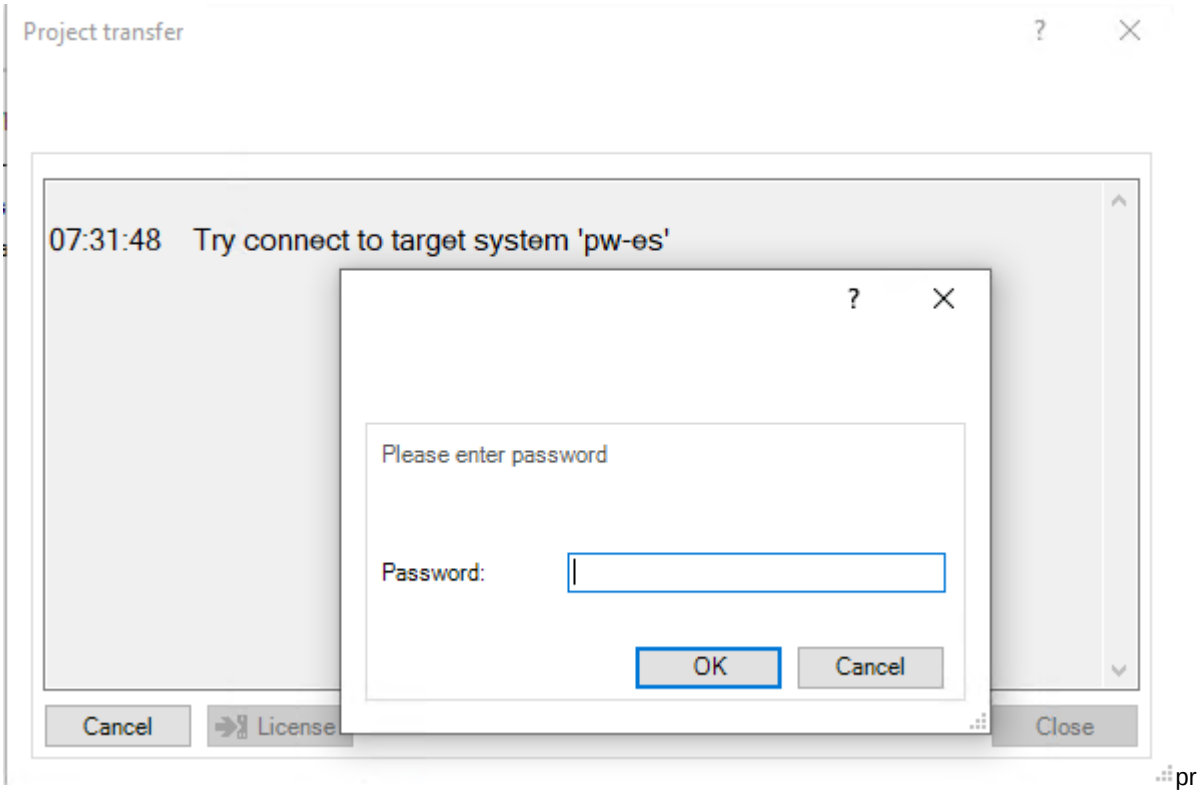


Fig. 93 Start of project transfer

If the Designer has successfully connected to the target system, the project can be transferred to the target system via the "Project" button. Information about the task is displayed in the dialogue (e.g,"Project successfully transferred to target system" when the transfer of the project is completed)

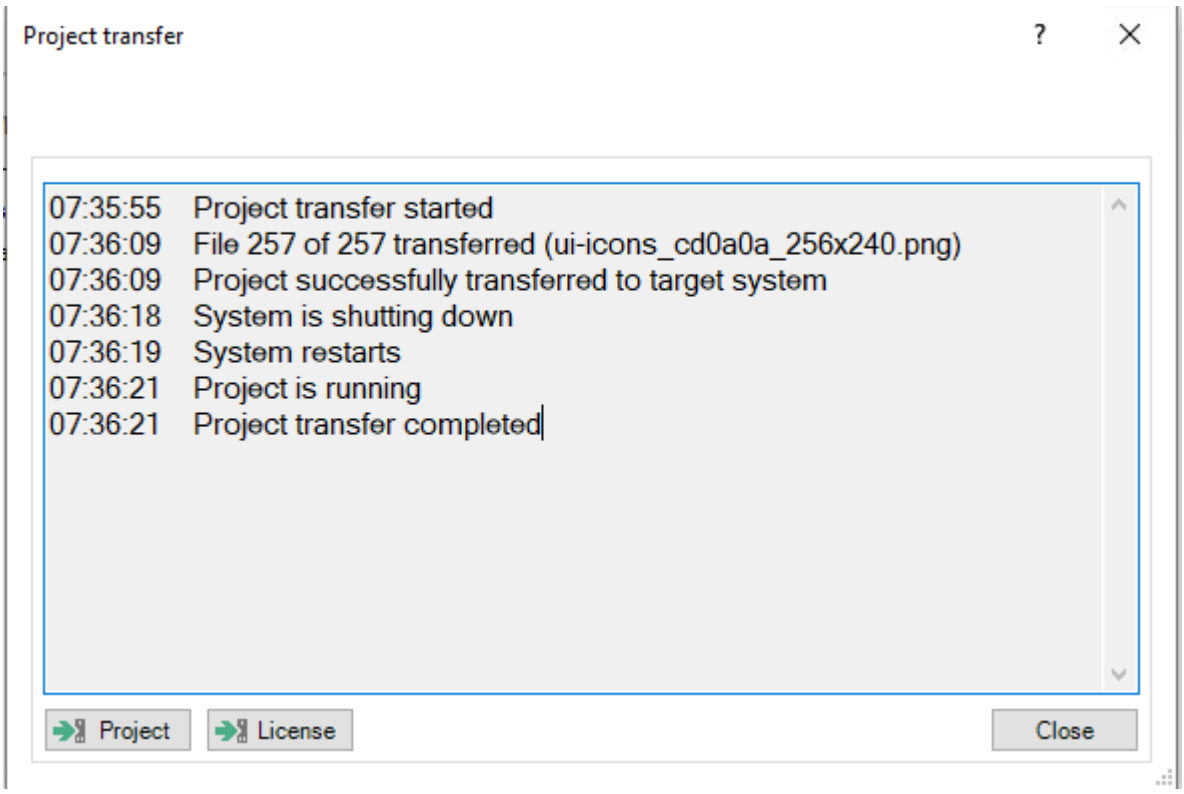


Fig. 94 Progress bar Project Transfer

Transfer License file

If the Designer has successfully connected to the target system, a license file can be transferred to the target system via the "License" button, if none is already available on the target system.

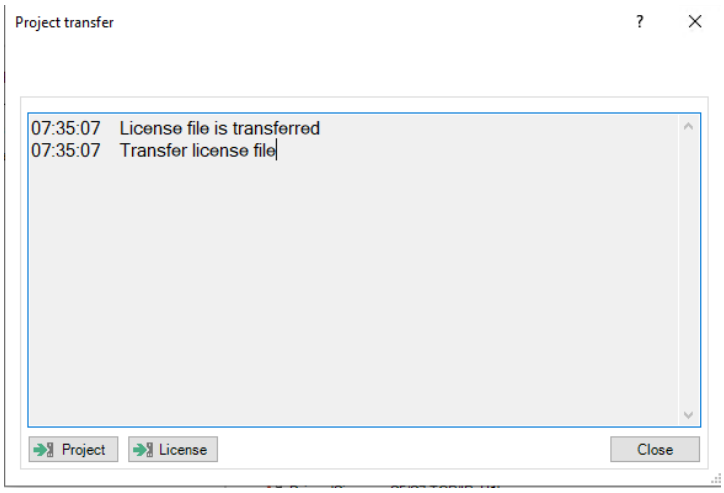


Fig. 95 Transfer licence file

12.7. Manual project transfer to targetsystem

If the target system is not directly connected to the Designer, the generated project data can also be transferred manually to the target system.

Depending on the respective target system, the project files that the Designer has created are to be sent to the target system, e.g., by e-mail or USB stick and then copied to the folder structure.

SCADA (Windows)

The project directory under .\PROCON-WEB\Projects must be completely transferred to the target system. Subsequently, a reboot of the runtime system must take place.

Codesys V3

The project directory under .\PROCON-WEB\Projects must be partially transferred to the target system. The WebVisu directory is copied to the web directory of the controller. It is recommended to create a subfolder here and only copy the contents of the WebVisu directory.

Furthermore, all *.bin files must be transferred to the controller. Their filing path varies depending on the control type. As standard for the common controllers, these are in the PLC directory. This path can be adjusted via the configuration of the Codesys PROCON WEB block.

13. Multilingualism

PROCON-WEB offers the user the possibility to realize the project in several language versions. An unlimited number of languages can be managed in the Designer. For the runtime, any number can be selected from this pool for export. The configuration is carried out in the PROCON-WEB Designer by entering each text for the respective language. For many texts and languages, however, this approach is quite idle. Therefore, it is alternatively also possible to edit the languages via the integrated export functionality in external tools (e.g., MS Excel). The possibility of external editing with standard tools offers the advantage that the texts can be passed on to a translation agency, e.g. By supporting Unicode character sets, projects with foreign fonts can also be implemented.

13.1. Language definition in the Project

13.2. Language definition in the Designer

The languages for the Designer project are created via the language selection box in the toolbar with "Edit languages".

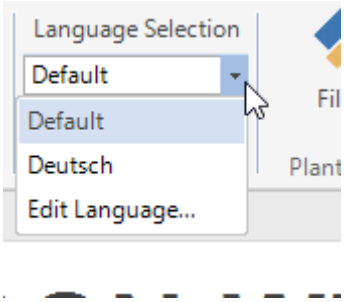


Fig. 96 Language selection

The five languages German, English, French, Spanish and Italian are already predefined. If additional languages are required, they can be added via the context menu. This dialogue defines and selects the languages for the runtime.

For a new project, "German" is set to active by default and marked as the default language.

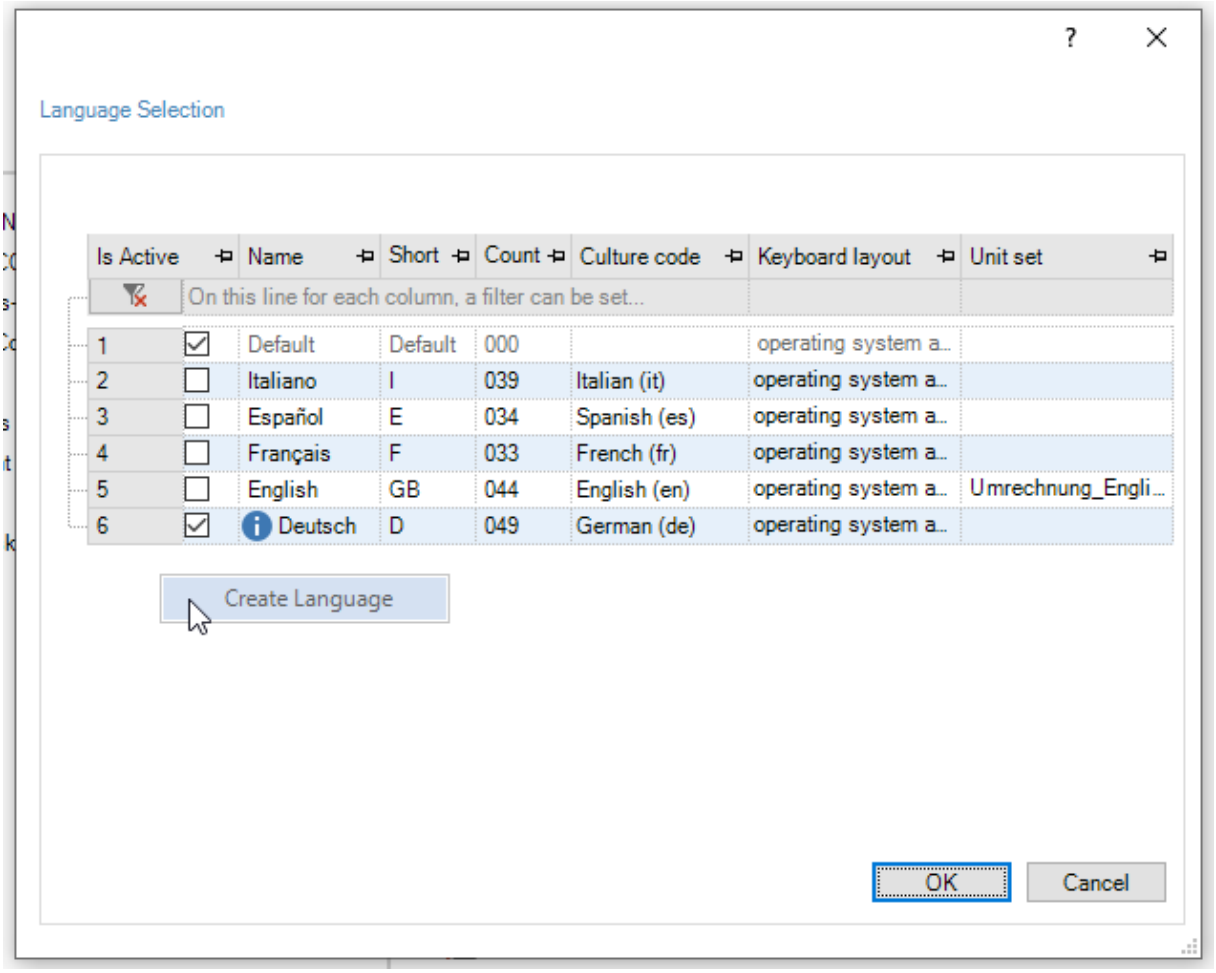


Fig. 97 Language selection

13.3. Set the default language for the Runtime

To mark a language as the default language, the selected language must be active. Otherwise, this is not possible. Setting the default language is done via the context menu (Mark as default language). Only one language can be selected at a time.

HINT

The default language cannot be deleted!

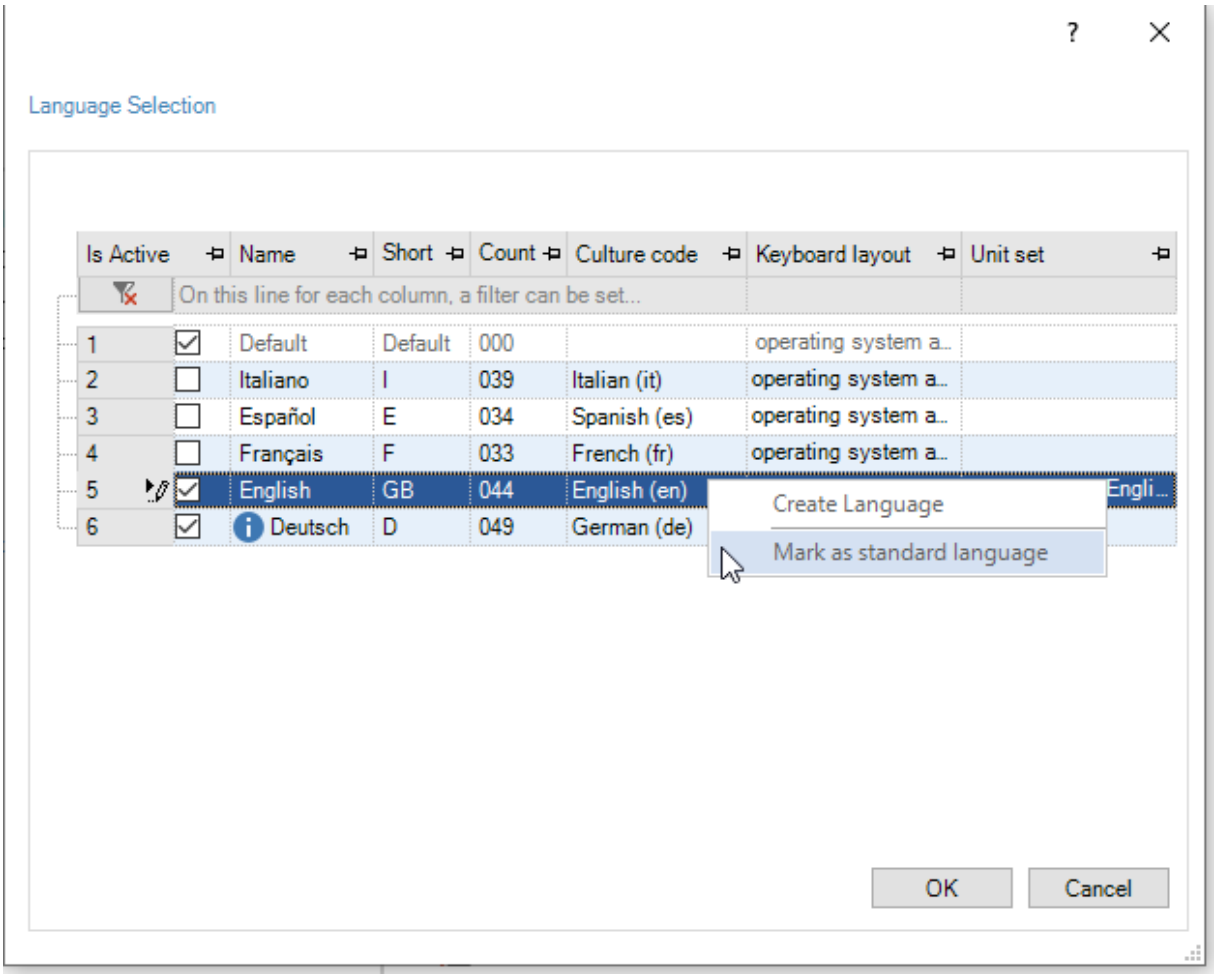


Fig. 98 Setting the default language

The language that is marked as the default language is visually highlighted by an info icon in the name cell.

13.4. Project conversion of old projects

When converting old projects, there are three cases that can occur:

- No language is active (Default only) > "German" is enabled and marked as the default language.
- "German" is active -> "German" is marked as the default language.
- Other languages are active, but "German" is not -> one of the active languages is marked as the default language.

13.5. Pictures

In the picture editor, objects such as static text symbols, text constants, text variables, picture names as well as function key and diagram labels can be realized in multiple languages. To do this, the project should first be configured with the language setting "Default" in a language selected by the user, since the "Default" language is displayed at runtime in the absence of a translation.

HINT

If you do not configure with "Default", no text is displayed if the translation is missing.

The language to be configured is selected in the language selection box and the corresponding text is entered in the picture editor instead of the "Default" language. This must be done for each language.

INFORMATION

Default texts of text variables can be configured in multiple languages. at run time the default values of the text variables are not switched via language switching.

INFORMATION

Picture names are displayed in the project tree in the "Default" language

13.6. Messages und System messages

The alarm texts of the user-defined messages can also be configured in the respective languages. In the alarm editor, only the text of the set language is visible.

The system messages are already available for the standard languages. If additional languages are required, the system messages can also be translated.

13.7. Text-Import & Export

With the text import and export, PROCON-WEB provides a powerful tool for efficient and fast text editing outside the Designer. Any selection of texts created in the Designer is combined into a file and can be edited and translated as a block.

The exported texts are available for further processing, for example in MS Excel, in XML format.

13.8. Text-Export

Via the tab "Project Environment" > "Import/Export Text" > "Text Export" the configuration dialogue for the text export opens.

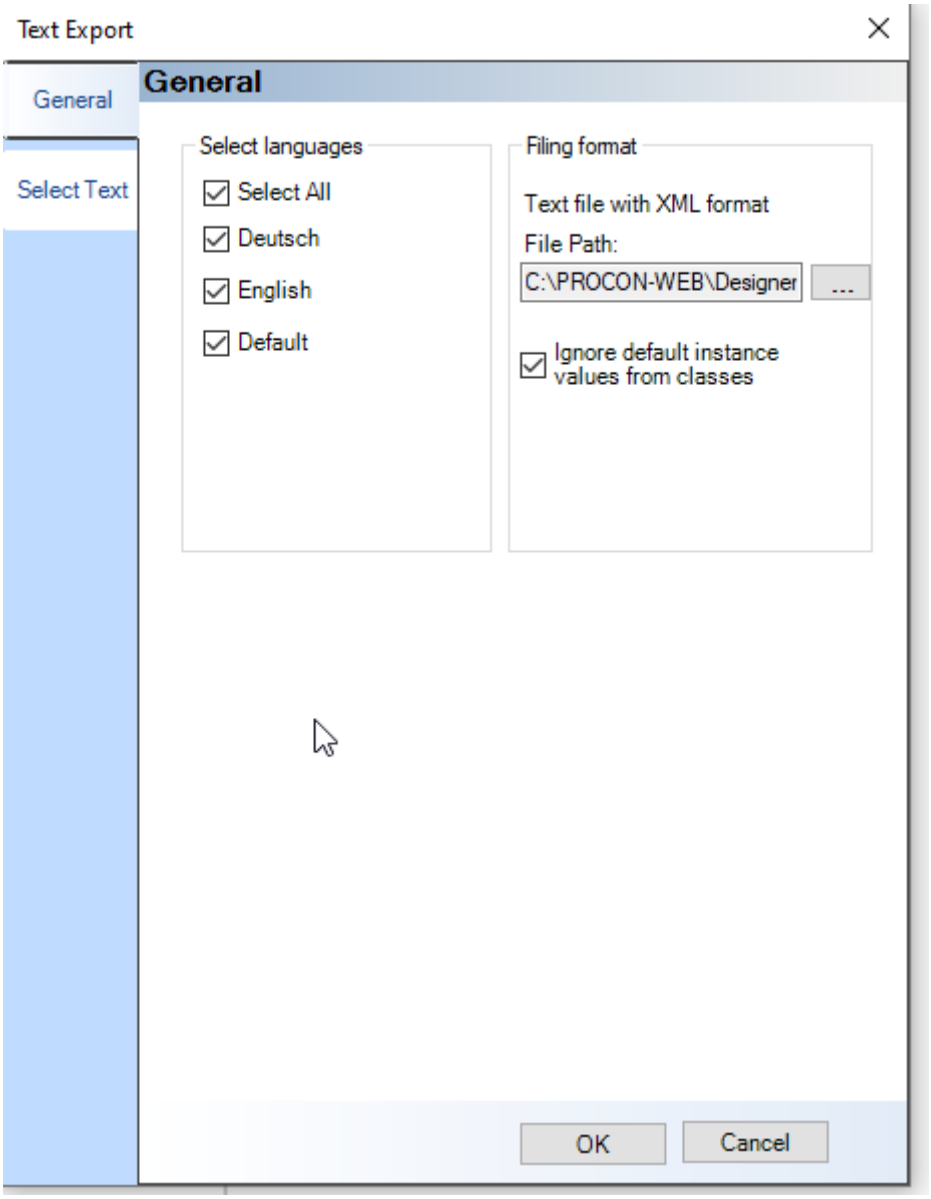


Fig. 99 Textexport

The language selection supports the export of individual or all languages known in PROCON-WEB The following options are available in the configuration dialogue.

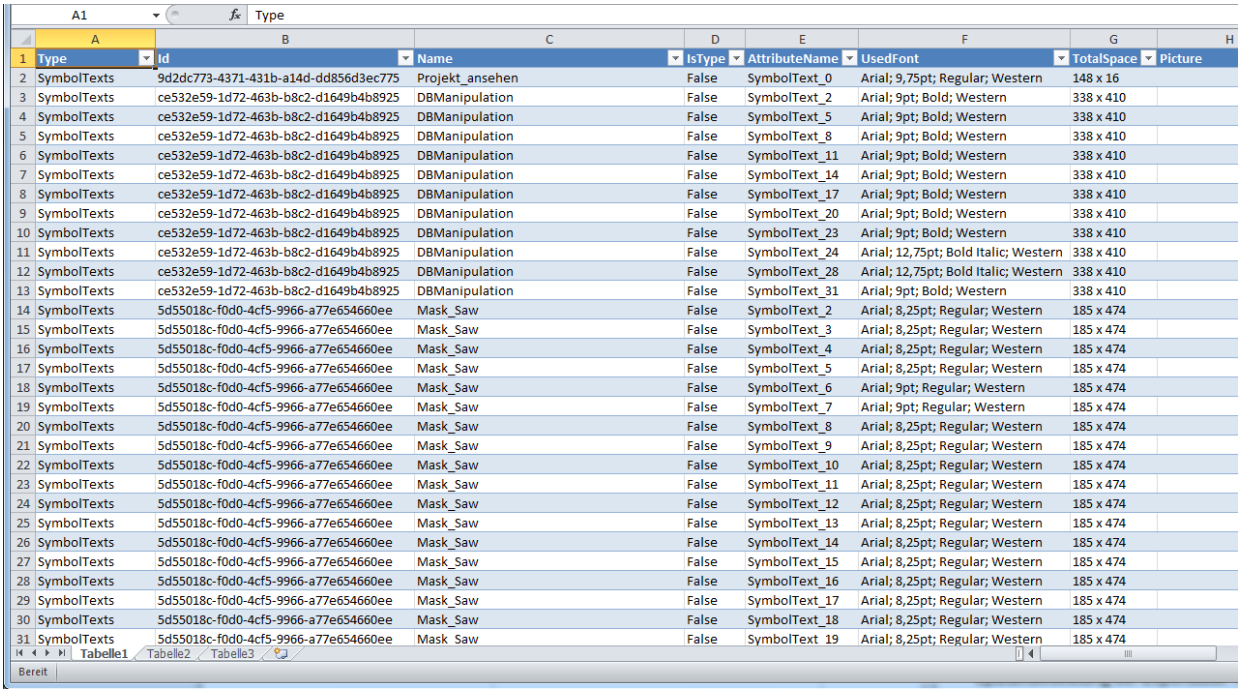
13.9. Selection of text

The text selection allows the de-selection of individual texts that are not to be edited or should be edited later. For very large projects, it makes more sense not to export all texts at the same time for reasons of time and clarity.

During text export, the selected texts are exported to an XML file. The default name of the export file is "TextImportExport.xml"

The exported file can be viewed with MS Excel and the content can be changed.

The column headings may not be changed, individual columns may be deleted, swapped or new ones inserted.



Type	Id	Name	IsType	AttributeName	UsedFont	TotalSpace	Picture
SymbolTexts	9d2dc773-4371-431b-a14d-dd856d3ec775	Projekt_ansehen	False	SymbolText_0	Arial; 9,75pt; Regular; Western	148 x 16	
SymbolTexts	ce532e59-1d72-463b-b8c2-d1649b4b8925	DBManipulation	False	SymbolText_2	Arial; 9pt; Bold; Western	338 x 410	
SymbolTexts	ce532e59-1d72-463b-b8c2-d1649b4b8925	DBManipulation	False	SymbolText_5	Arial; 9pt; Bold; Western	338 x 410	
SymbolTexts	ce532e59-1d72-463b-b8c2-d1649b4b8925	DBManipulation	False	SymbolText_8	Arial; 9pt; Bold; Western	338 x 410	
SymbolTexts	ce532e59-1d72-463b-b8c2-d1649b4b8925	DBManipulation	False	SymbolText_11	Arial; 9pt; Bold; Western	338 x 410	
SymbolTexts	ce532e59-1d72-463b-b8c2-d1649b4b8925	DBManipulation	False	SymbolText_14	Arial; 9pt; Bold; Western	338 x 410	
SymbolTexts	ce532e59-1d72-463b-b8c2-d1649b4b8925	DBManipulation	False	SymbolText_17	Arial; 9pt; Bold; Western	338 x 410	
SymbolTexts	ce532e59-1d72-463b-b8c2-d1649b4b8925	DBManipulation	False	SymbolText_20	Arial; 9pt; Bold; Western	338 x 410	
SymbolTexts	ce532e59-1d72-463b-b8c2-d1649b4b8925	DBManipulation	False	SymbolText_23	Arial; 9pt; Bold; Western	338 x 410	
SymbolTexts	ce532e59-1d72-463b-b8c2-d1649b4b8925	DBManipulation	False	SymbolText_24	Arial; 12,75pt; Bold Italic; Western	338 x 410	
SymbolTexts	ce532e59-1d72-463b-b8c2-d1649b4b8925	DBManipulation	False	SymbolText_28	Arial; 12,75pt; Bold Italic; Western	338 x 410	
SymbolTexts	ce532e59-1d72-463b-b8c2-d1649b4b8925	DBManipulation	False	SymbolText_31	Arial; 9pt; Bold; Western	338 x 410	
SymbolTexts	5d55018c-f0d0-4cf5-9966-a77e654660ee	Mask_Saw	False	SymbolText_2	Arial; 8,25pt; Regular; Western	185 x 474	
SymbolTexts	5d55018c-f0d0-4cf5-9966-a77e654660ee	Mask_Saw	False	SymbolText_3	Arial; 8,25pt; Regular; Western	185 x 474	
SymbolTexts	5d55018c-f0d0-4cf5-9966-a77e654660ee	Mask_Saw	False	SymbolText_4	Arial; 8,25pt; Regular; Western	185 x 474	
SymbolTexts	5d55018c-f0d0-4cf5-9966-a77e654660ee	Mask_Saw	False	SymbolText_5	Arial; 8,25pt; Regular; Western	185 x 474	
SymbolTexts	5d55018c-f0d0-4cf5-9966-a77e654660ee	Mask_Saw	False	SymbolText_6	Arial; 9pt; Regular; Western	185 x 474	
SymbolTexts	5d55018c-f0d0-4cf5-9966-a77e654660ee	Mask_Saw	False	SymbolText_7	Arial; 9pt; Regular; Western	185 x 474	
SymbolTexts	5d55018c-f0d0-4cf5-9966-a77e654660ee	Mask_Saw	False	SymbolText_8	Arial; 8,25pt; Regular; Western	185 x 474	
SymbolTexts	5d55018c-f0d0-4cf5-9966-a77e654660ee	Mask_Saw	False	SymbolText_9	Arial; 8,25pt; Regular; Western	185 x 474	
SymbolTexts	5d55018c-f0d0-4cf5-9966-a77e654660ee	Mask_Saw	False	SymbolText_10	Arial; 8,25pt; Regular; Western	185 x 474	
SymbolTexts	5d55018c-f0d0-4cf5-9966-a77e654660ee	Mask_Saw	False	SymbolText_11	Arial; 8,25pt; Regular; Western	185 x 474	
SymbolTexts	5d55018c-f0d0-4cf5-9966-a77e654660ee	Mask_Saw	False	SymbolText_12	Arial; 8,25pt; Regular; Western	185 x 474	
SymbolTexts	5d55018c-f0d0-4cf5-9966-a77e654660ee	Mask_Saw	False	SymbolText_13	Arial; 8,25pt; Regular; Western	185 x 474	
SymbolTexts	5d55018c-f0d0-4cf5-9966-a77e654660ee	Mask_Saw	False	SymbolText_14	Arial; 8,25pt; Regular; Western	185 x 474	
SymbolTexts	5d55018c-f0d0-4cf5-9966-a77e654660ee	Mask_Saw	False	SymbolText_15	Arial; 8,25pt; Regular; Western	185 x 474	
SymbolTexts	5d55018c-f0d0-4cf5-9966-a77e654660ee	Mask_Saw	False	SymbolText_16	Arial; 8,25pt; Regular; Western	185 x 474	
SymbolTexts	5d55018c-f0d0-4cf5-9966-a77e654660ee	Mask_Saw	False	SymbolText_17	Arial; 8,25pt; Regular; Western	185 x 474	
SymbolTexts	5d55018c-f0d0-4cf5-9966-a77e654660ee	Mask_Saw	False	SymbolText_18	Arial; 8,25pt; Regular; Western	185 x 474	
SymbolTexts	5d55018c-f0d0-4cf5-9966-a77e654660ee	Mask_Saw	False	SymbolText_19	Arial; 8,25pt; Regular; Western	185 x 474	

Fig. 100 Display of the export file in MS Excel

13.10. Text-Import

The dialogue for the text import is structured analogously to the text export. If only English texts have been changed externally, e.g., you can deactivate the switch for the original German texts during the import to speed up the text import process.

13.11. Import/Export of other language files

In addition to exporting and importing texts, messages and tags can also be exported, edited, and then imported again as XML files. A dialogue opens in which the language(s) to be exported can be selected. For the messages, as well as the tags, the texts to be displayed can be translated into the respective languages and then displayed in the runtime when selecting the respective language.

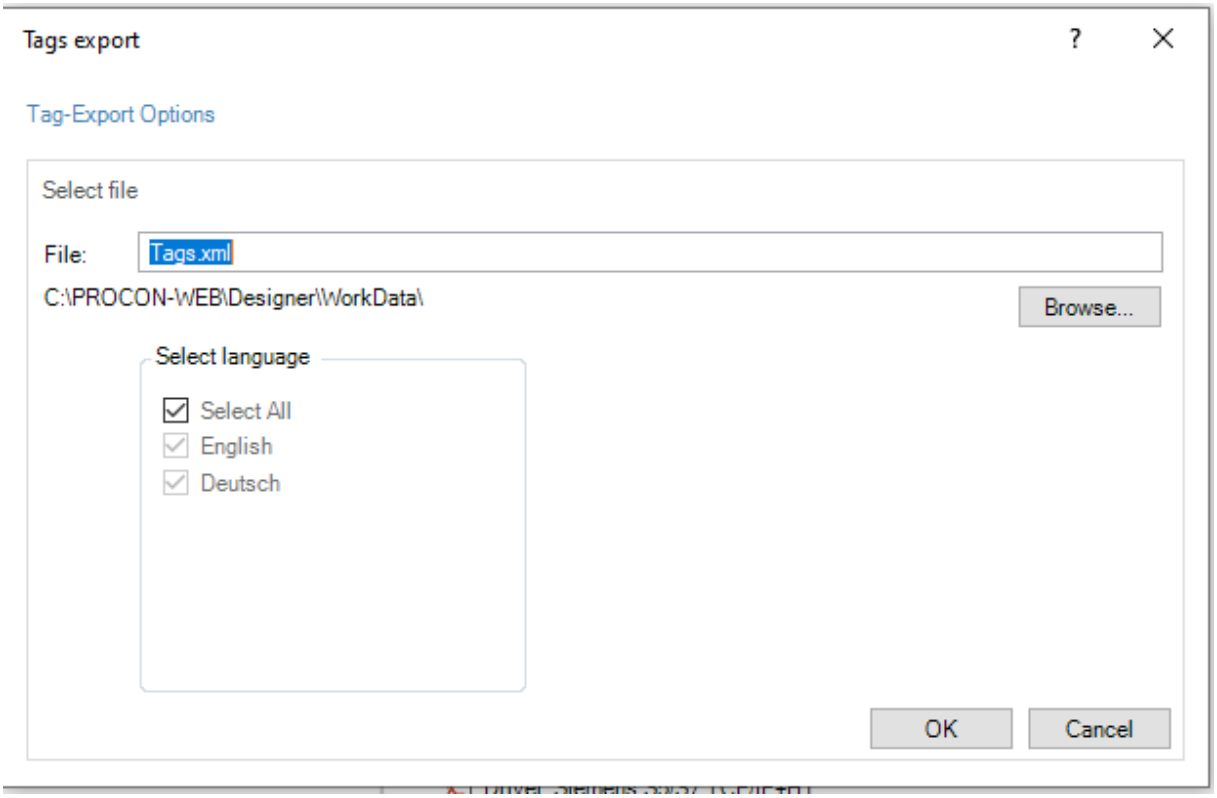


Fig. 101 Export of variables

13.12. Available system languages

The system texts of the runtime system are already available in French, Spanish, Italian, English and German. For each additional language, the system texts must be created and translated. Since system texts and the corresponding application are independent of each other, it may be sufficient to deliver the project in the national language and the system texts in English. There is no need to translate the texts.