

WAGO Software

WAGO Solution Builder



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Every conceivable measure has been taken to ensure the accuracy and completeness of this documentation. However, as errors can never be fully excluded, we always appreciate any information or suggestions for improving the documentation.

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We wish to point out that the software and hardware terms as well as the trademarks of companies used and/or mentioned in the present documentation are generally protected by trademark or patent.

WAGO is a registered trademark of WAGO Verwaltungsgesellschaft mbH.

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1 Provisions

This documentation applies to the WAGO Solution Builder software, software version 2.4.1.

Table 1: Scope of Applicability – Versions

WAGO Solution Builder Version	Documentation Version
2.4.1	14

Besides this documentation/online help, the following supplementary documents are available:

- Manuals for linked configurators (e.g., WAGO BACnet Configurator)
- Manuals for products used (e.g., PFC200)
- Manuals for software used (e.g., CODESYS or *e!COCKPIT*)

The software must only be installed and operated in accordance with the operating instructions. Knowledge of the operating instructions is required for proper use.

Please find all documents and information at:

www.wago.com/global/solution-builder

1.1 Intended Use

WAGO Solution Builder is a central development environment for tasks in building automation. This software enables contractors to organize all of their projects in one central database and to process these in parallel. The following tasks can be performed with the software:

- Create customer projects.
- Manage customer projects.
- Configure customer projects.
- Transfer customer projects to WAGO controllers.
- Document customer projects.

Software operation is only permitted if the system requirements and license conditions are met.

Improper Use

Improper use of the software is prohibited.

Improper use occurs in particular in the following cases:

- Non-observance of the intended use
- Implementation of a Known Misuse
- Use of the software in areas with special risk that require continuous fault-free operation and in which failure of or operation of the software can result in an imminent risk to life, limb or health or cause serious damage to property or the environment (such as the operation of nuclear power plants, weapons systems, aircraft and motor vehicles)

Warranty and Liability

The provisions of the latest WAGO General Terms and Conditions of Deliveries and Services (GTC) apply as well as the Software License Terms for Standard Software (SW-License) applicable to software products und software embedded in WAGO hardware products, both available at: www.wago.com.

In particular, the warranty is void when:

- The products are used improperly.
- The defect is based on (customer-)specific specifications (hardware and software configurations).
- Modifications of the hardware or software by the user or third parties were made that are not described in this documentation and are at least responsible for the occurrence of the defect.

Individual agreements always take precedence.

Obligations of the installer/operator

Installers and operators bear responsibility for the safety of an installation or a system assembled with the product.

The installer/operator is responsible for the proper installation and the safety of the system. It must comply with the laws, standards, guidelines, local regulations, the state and the rules of technology applicable at the time of installation and must observe the guidelines and instructions described in the operating instructions. The installation requirements of the approvals must also be met.

In the event of non-compliance, operation of product within the scope of the approval is not permitted.

1.2 Typographical Conventions

Number Notation




100	Decimals: Normal notation
0x64	Hexadecimals: C-notation
'100'	Binary: In single quotation marks
'0110.0100'	Nibbles separated by a period

Text Markups

<i>italic</i>	Names of paths or files
bold	Menu items, entry or selection fields, emphasis
Code	Excerpts from program code
>	Selection of a menu point from a menu
"Value"	Value entries
[F5]	Identification of buttons or keys

Links

	Link to a topic in a document
---	-------------------------------

	Link to a separate document
	Link to a website
	Link to an email address
Glossary	Link to a glossary entry

Sequence of Action

- ✓ This symbol identifies a precondition.
- 1. Action step
- 2. Action step
 - ⇒ This symbol identifies an intermediate result.
- ➔ This symbol identifies the result of an action.
- Individual action step

Lists

- Lists, first level
 - Lists, second level

Figures

Figures in this documentation are for better understanding and may differ from the actual product design.

Warning Messages

 **DANGER**

Type and source of hazard

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

- Action step to reduce risk
-

 **WARNING**

Type and source of hazard

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

- Action step to reduce risk
-

 **CAUTION**

Type and source of hazard

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

- Action step to reduce risk
-

NOTICE

Type and source of malfunction (property damage only)

Indicates a potentially hazardous situation which, if not avoided, may result in damage to property.

- Action step to reduce risk
-

Information Notices

Note

Information

Indicates information, clarifications, recommendations, referrals, etc.

1.3 Legal Information

Intellectual property

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Third-party trademarks are referred to in the product documentation. The "®" and "™" symbols are omitted hereinafter. The trademarks are listed in the Appendix: [Protected Rights \[▶ 196\]](#).

Subject to Change

The instructions, guidelines, standards, etc., in this manual correspond to state of the art at the time the documentation was created and are not subject to updating service. The installer and operator bear sole responsibility to ensure they are complied with in their currently applicable form. WAGO GmbH & Co. KG retains the right to carry out technical changes and improvements of the products and the data, specifications and illustrations of this manual. All claims for change or improvement of products that have already been delivered – excepting change or improvement performed under guarantee agreement – are excluded.

Licenses

The WAGO Solution Builder software and related components are protected by license mechanisms.

2 Security

2.1 General Safety Regulations

- This documentation is part of the software. Therefore, keep the documentation for the entire service life of the software. Pass on the documentation to the next user of the software. In addition, ensure that any supplement to this documentation is included, if necessary.
- Any actions related to the use of WAGO software may only be performed by qualified staff with sufficient knowledge to use the respective PC system.
Steps in which files are created or changed on a PC system may only be performed by qualified employees with sufficient knowledge in the administration of the PC system used in addition to file creation or modification.
Steps that change the PC system's behavior within a network may only be performed by qualified employees with sufficient knowledge of administration of the responsible network.
- Set up permissions management for authorized persons.
 - Digital access may only be made by authorized persons.
- Comply with the laws, standards, guidelines, local regulations and accepted technology standards and practices applicable at the time of installation.

2.2 Indirect Safety

- If automation solutions are implemented that can lead to personal injury or significant property damage in the event of failure, you must take appropriate measures to ensure that the system remains in a safe operating state even in the event of failure.
- Give all products in a network different IP addresses.
- Never connect a PC on which a DHCP server is installed to a global network. Larger networks usually already have a DHCP server, which can cause collisions that lead to network breakdown.
- Use only the latest security software.
- Uninstall or disable all software components or programs on your PC that are not required for the intended use.
- If there are access problems, check whether the *e!RUNTIME* runtime system is activated on the connected devices. Use a software tool (depending on the hardware) to perform the check or use the Web-Based Management System.

3 Overview

The WAGO Solution Builder software is a central development environment for building automation tasks. The software itself takes the form of a program package containing several individual components.

Each individual component from this program package has a different function; it may depend on another component, or another component may depend on it (see [🔗 Topology \[▶ 15\]](#)).

The program package consists of the following components:

The following components are installed and configured during the installation process according to the installation type selected:

- WAGO Solution Builder Webserver
- WAGO Solution Builder database (PostgreSQL)
- WAGO Solution Builder Plug-in for CODESYS
- WAGO Solution Builder Plug-in for *e!COCKPIT*
- WAGO Device Communication Service
- WAGO Tool Gateway Service
- WAGO Legacy Communication Service
- Windows Firewall enabler for the WAGO Device Communication Service DHCP server

4 Requirements

The system requirements listed here pertain to the WAGO Solution Builder software, consisting of a Webserver, a database, background services and configurators.

Minimum System Requirements

Table 2: Minimum System Requirements

Component	Requirements
Operating system	Windows 10 x86
Memory	6 GB
Free hard disk space	30 GB
Processor	4 CPU cores
Screen resolution	1366 × 768 pixels

Recommended System Specifications

Table 3: Recommended System Specifications

Component	Requirements
Operating system	Windows 10 x64
Memory	8 GB
Free hard disk space	60 GB
Processor	8 CPU cores
Screen resolution	1920 × 1080 pixels

Requirements: The WAGO Solution Builder Plug-in software requires an IEC development environment

To use the WAGO Solution Builder Plug-in software, you must have an [IEC development environment](#) installed on your PC. The software must then be manually enabled or installed in this IEC development environment.

For more information, see [🔗 Installing the WAGO Solution Builder Plug-in in e!COCKPIT \[▶ 23\]](#) and [🔗 Installing the WAGO Solution Builder Plug-in in CODESYS \[▶ 25\]](#).

You need the WAGO “Licensing” add-on to identify factory-installed licenses and use optional and licensed license libraries under CODESYS. You can find the add-on in the [🔗 WAGO Download Center](#).

Requirements: Access Rights to Server Addresses

The WAGO Solution Builder software requires partial access to certain URLs in order to function. Therefore, the following URLs must not be blocked in the network:

Table 4: Requirements: Access Rights to Server Addresses

URL	Server Address	Description
WAGO TechDocs	🔗 https://tech-docs.wago.com	This is where the latest version of the HTML help is stored.
WAGO License Server	🔗 https://upd.wago.com/LicenseService.svc	This is used to check DRM licenses that have been entered and activate them.
WAGO Download Center	🔗 https://downloadcenter.wago.com	This stores firmware, IPK packages and application templates .
Gigya Sign-On Library (required for WAGO Download Center)	🔗 https://gigya.account.wago.com	This is used for logging into the WAGO Download Center.

Requirements: Ports to Enable

Certain ports are required to manage and configure connected controllers. The following ports must be enabled between the WAGO Device Communication Service software and the controllers (or in the controller firewall):

Table 5: Requirements: Ports to Enable

Port	Name	Description
22	SSH	For monitoring and configuring the controllers.
443	https	Secure WBM access to the controllers.
80	http	Insecure WBM access to the controllers. Only to be used in exceptional cases!
6626	WAGO-I/O-CHECK	WAGO service port for controller configuration.
2455 (Version 2)	CODESYS 2.3	PLHandler access to CODESYS runtime.
11740 (Version 3)	CODESYS 3.5	PLHandler access to CODESYS runtime.

Requirements: Installed Services

The following services are installed and set up as services:

Table 6: Requirements: Installed Services

Service	Description
DeviceCommunicationService.exe	WAGO Device Communication Service
LegacyCommunicationService.exe	WAGO Legacy Communication Service
SolutionBuilder.exe	WAGO Solution Builder
pg_ctl.exe	WAGO Solution Builder Database (PostgreSQL)

4.1 Licenses

To use the WAGO Solution Builder software to its full extent and with any number of controllers, licenses are required.

After registering for the first time in WAGO Solution Builder software, you can use it for 30 days without a license key for testing purposes. During the evaluation period, a banner appears in Start View showing the remaining validity period of the evaluation license.

Once the evaluation period has expired, the WAGO Solution Builder software can continue to be used in full with up to three existing controllers without an active license. If more than three controllers are used, a corresponding license must be purchased.

The licenses are valid for one year. This validity period starts when the license is activated.

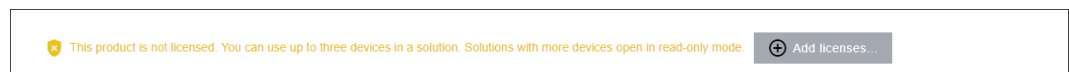


Figure 1: Start View: Banner

As soon as a license has been purchased and activated, the banner disappears in the Start View. In "Solutions" Menu, a green checkmark appears after "Licensing" Menu Item:

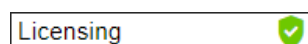


Figure 2: "Licensing" Menu Item: Activated License

In "Licensing" Menu Item, all purchased and activated licenses are listed in the "LICENSE REPOSITORY" tab:

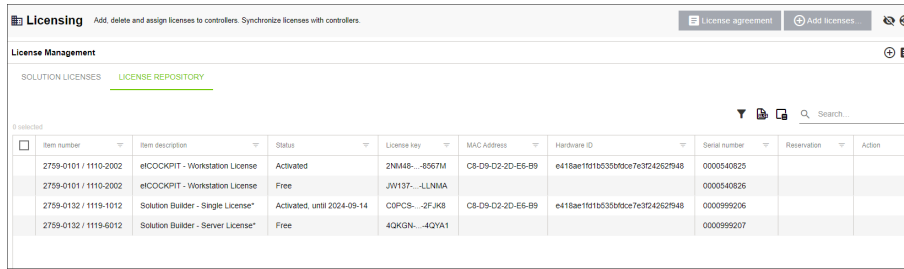


Figure 3: "LICENSE REPOSITORY" Tab: Activated License

For the WAGO Solution Builder software, WAGO offers three different licenses:

Table 7: Orderable licenses for the WAGO Solution Builder software

Designation	License Type	Description	Item Number
WAGO Solution Builder; User License; 1 year	Single license	The license can be used on one PC. A user can create any number of solutions (projects) and use them to their full extent.	2759-0132/1119-1012
WAGO Solution Builder; Site License; 1 year	Site license	The license can be used on one server. Any number of users can create a solution (a project) and use it to its full extent.	2759-0132/1119-3012
WAGO Solution Builder; Server License; 1 year	Server license	The license can be used on one server. Any number of users can create as many solutions (projects) as they want and use them to their full extent.	2759-0132/1119-6012

5 Function Description

5.1 Topology

This visually illustrates the interdependencies among the individual components of the program package (see [Overview \[p. 11\]](#)) and the individual functions that they provide.

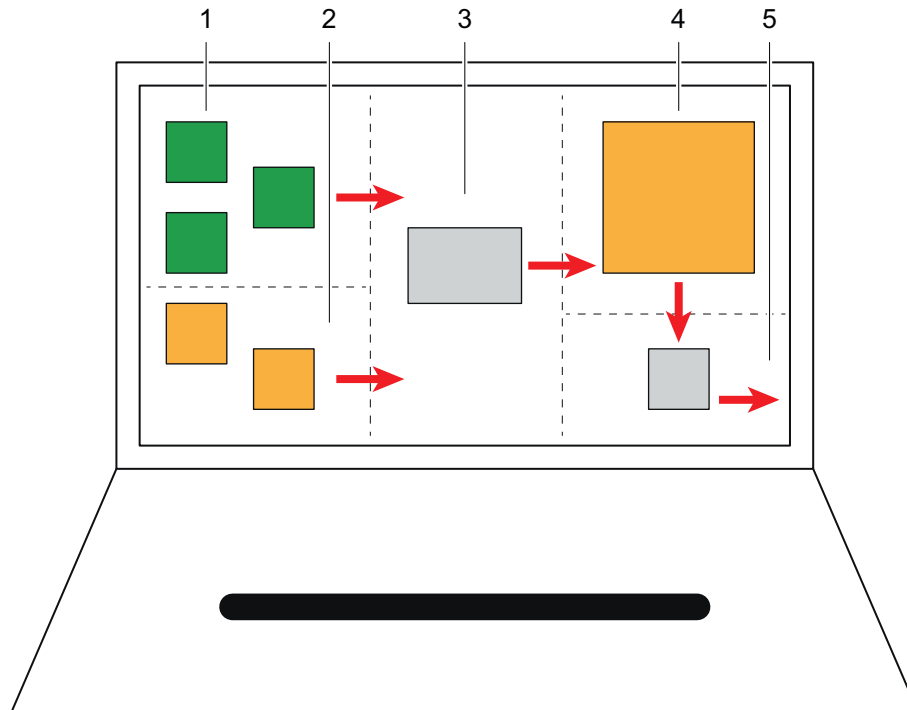


Figure 4: Topology

Position	Area	Description
1	Field Bus Configurators	<p>The individual fieldbus configurators represent an input parameter for the WAGO Solution Builder software. The software currently supports the following fieldbus configurators:</p> <ul style="list-style-type: none"> • WAGO BACnet-Konfigurator • WAGO DALI Konfigurator • WAGO SMI Konfigurator <p>You can open the individual configurators directly from the WAGO Solution Builder software to perform fieldbus-specific tasks in the network.</p>
2	WAGO Solution Builder Plug-in for application templates	<p>Additional optional input variables are available for the WAGO Solution Builder software:</p> <ul style="list-style-type: none"> • WAGO Solution Builder Plug-in for CODESYS • WAGO Solution Builder Plug-in for <i>e!COCKPIT</i> <p>The WAGO Solution Builder Plug-in software can be used to create application templates in advance in an IEC development environment (CODESYS/<i>e!COCKPIT</i>) and then import them into the WAGO Solution Builder software. The WAGO Tool Gateway Service software acts as the background service, functioning as an internal interface.</p>

Function Description

Position	Area	Description
3	WAGO Tool Gateway Service (TGS)	The WAGO Tool Gateway Service software forms an internal interface between the two input variables and the WAGO Solution Builder software. During installation, the WAGO Tool Gateway Service software is added to the Windows autostart applications, so it launches when Windows boots up. The icon on the Windows taskbar indicates the service that is running.
4	WAGO Solution Builder	WAGO Solution Builder is integrated engineering software for building automation with WAGO components. In the Software area, you can create various customer projects (called "solutions") and use application templates from the IEC development environment that have been created.
5	WAGO Device Communication Service (DCS)	The WAGO Device Communication Service software is an external interface for interconnected fieldbus controllers. The software is launched as a Windows service and executes individual job-based actions on the fieldbus controllers.

6 Installation

6.1 Installing WAGO Solution Builder on Windows

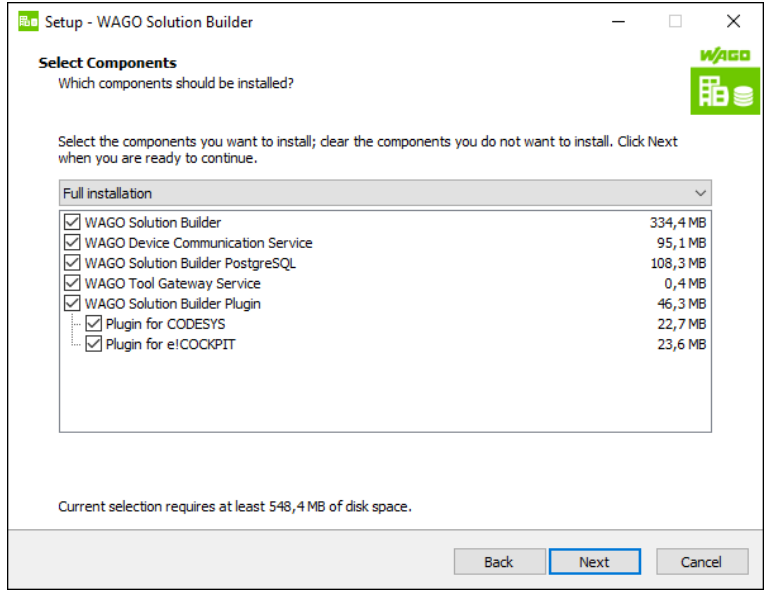
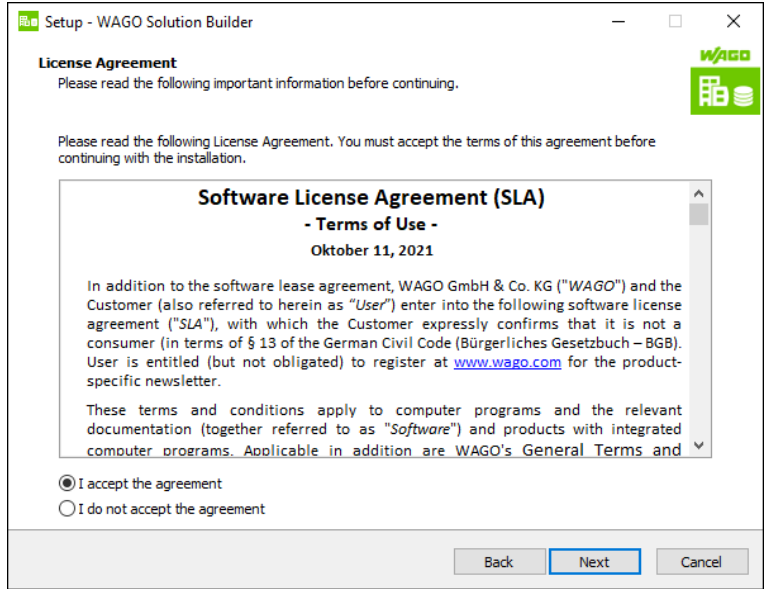
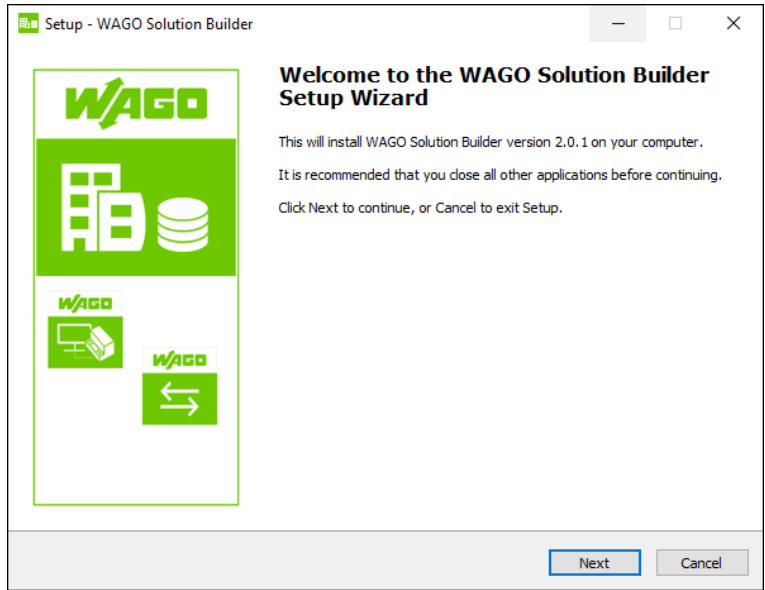
The WAGO Solution Builder software is installed with an installer file. The main component, the WAGO Solution Builder software, comes standard with this installer. The software consists of a Webserver and a PostgreSQL database, additional background services and the WAGO Solution Builder Plug-in software for the CODESYS and *e!COCKPIT* development environments.

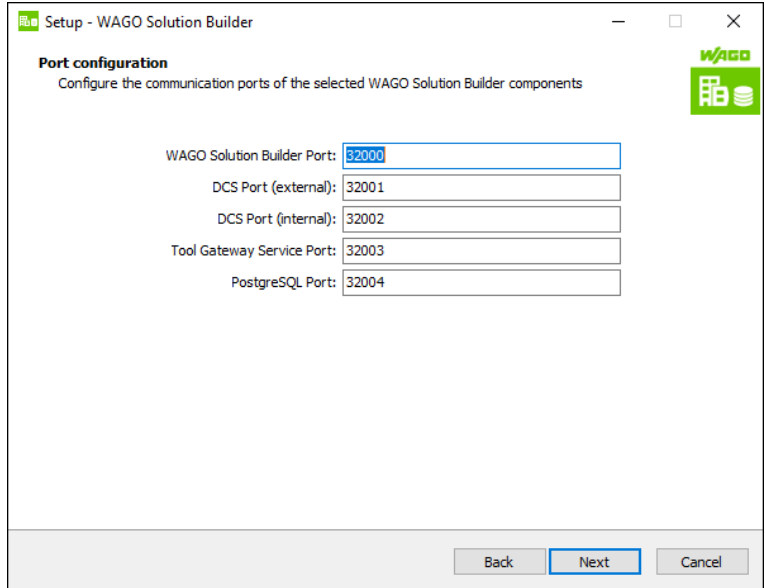
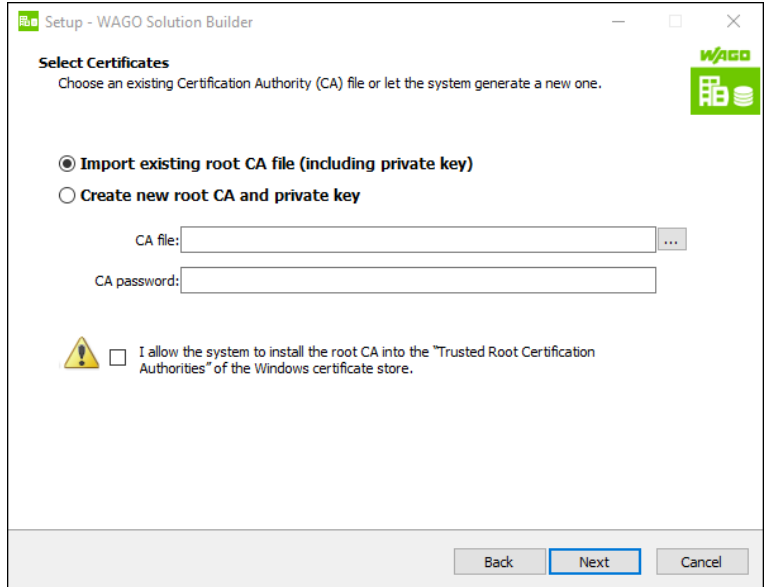
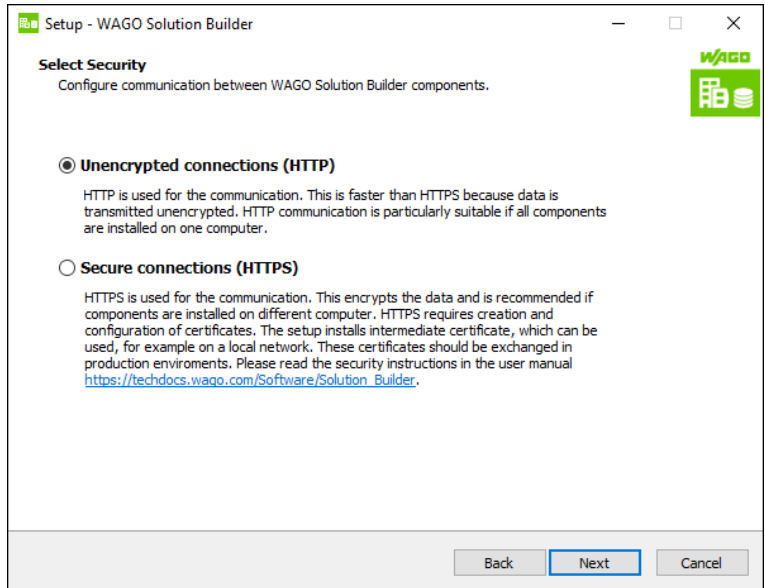
The following installation options are available:

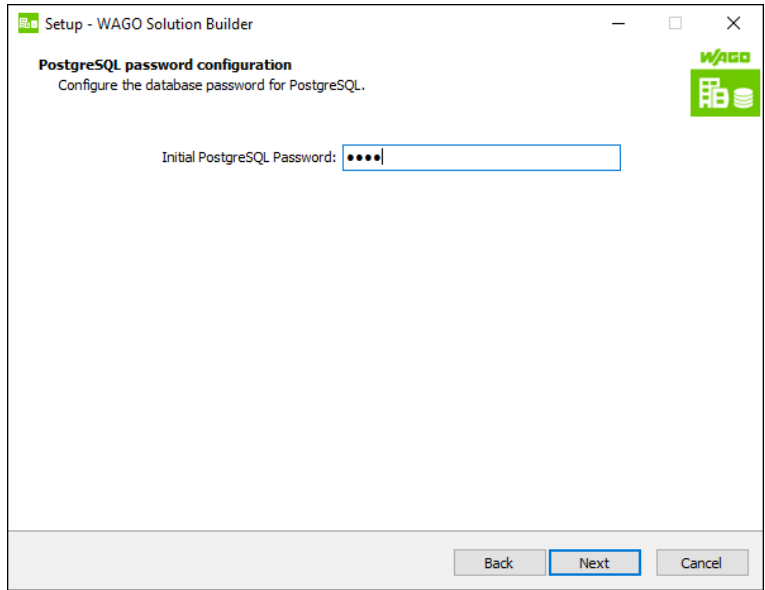
- **Full install:**
Installs all the components in the work environment used. All the components can then be used without limitation and executed in this work environment.
- **Distributed installation:**
Only installs individual components in the work environment used. All the other components can then be installed and run in other external work environments. For example, individual components could be executed on a local PC and the other components on a higher-level server.

Follow the steps below to install the WAGO Solution Builder software:

1. Download the software.
It is available at www.wago.com.
2. Start the installation process by double-clicking the installation file and follow the steps in the installation wizard:
 - a) Install the WAGO Solution Builder Package software package for the WAGO Solution Builder software.
 - b) Install the WAGO Solution Builder software:
 - Accept the license agreements.
 - Select "Full Install" if you want to install all components in one work environment.
 - Select "Custom Installation" if you only want to install subcomponents in a work environment.
 - Do not make any settings on the target ports.
 - Assign a PostgreSQL password (see [Superuser Password \[p. 20\]](#)).





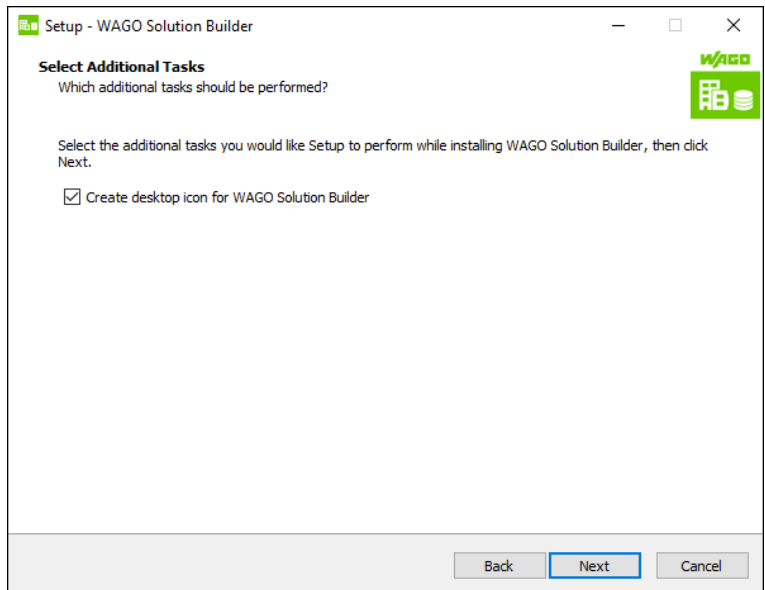


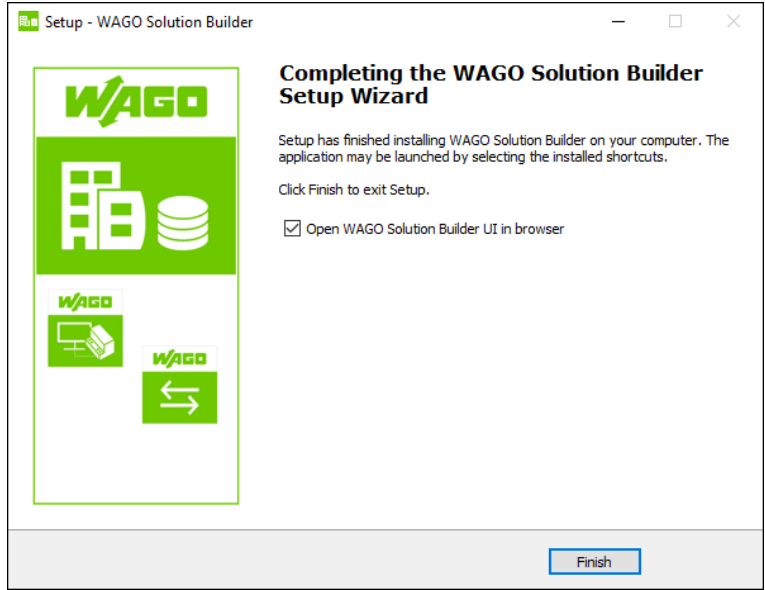
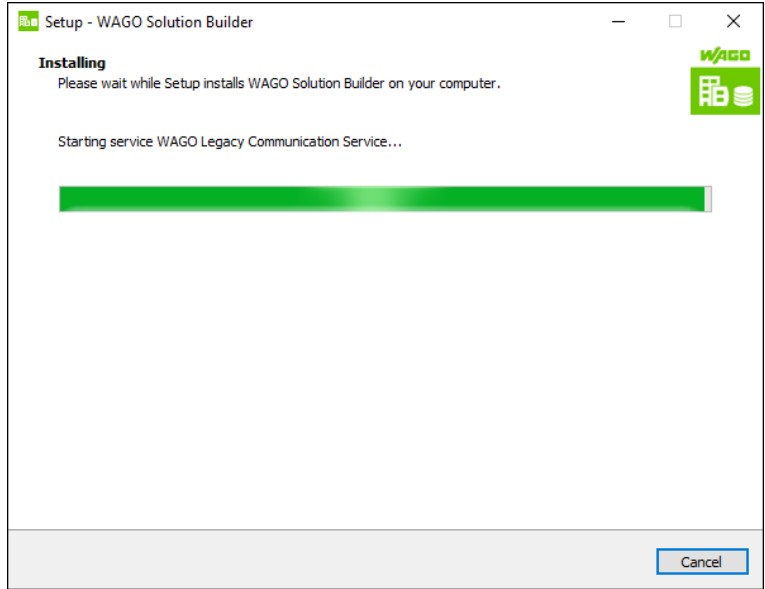
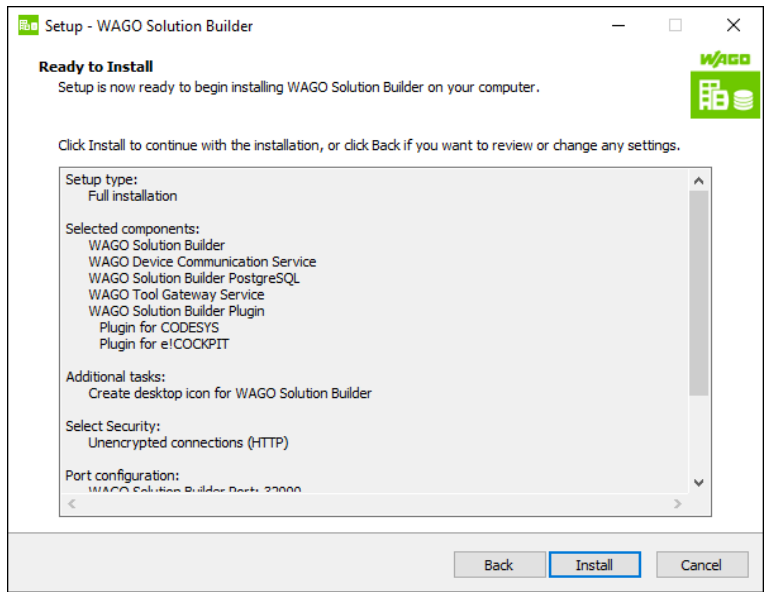
Note

PostgreSQL password required!

Enter an initial superuser password for the WAGO Solution Builder software's database in the "Initial PostgreSQL Password" field.

Be sure to remember the assigned password!





6.2 Installing WAGO Solution Builder on Linux

The following installation options are available:

- **Full install:**

Installs all the components in the work environment used. All the components can then be used without limitation and executed in this work environment.

- **Distributed installation:**

Only installs individual components in the work environment used. All the other components can then be installed and run in other external work environments. For example, individual components could be executed on a local PC and the other components on a higher-level server. The following three components are available for distributed installation:

- WAGO Solution Builder
- Device Communication Service
- PostgreSQL database server

Please observe the following:

- Use different ports for each application.
- The PostgreSQL password and port must be entered twice in consecutive installation steps. Be sure to remember what you entered for both!
- You can access the help function on Linux with `-h`.

```
~/Dokumente/Output$ sudo ./setup.sh
[sudo] Passwort
09:37:22 setup.sh [WAGO] [ > ] Setup started.
Holen:1 http://deb.debian.org/debian bookworm InRelease [151 kB]
Holen:2 http://security.debian.org/debian-security bookworm-security InRelease [48,0 kB]
Holen:3 http://deb.debian.org/debian bookworm-updates InRelease [55,4 kB]
Holen:4 http://deb.debian.org/debian bookworm/non-free-firmware Sources [7.152 B]
Holen:5 http://deb.debian.org/debian bookworm/main Sources [9.495 kB]
Holen:6 http://security.debian.org/debian-security bookworm-security/main Sources [195 kB]
Holen:7 http://security.debian.org/debian-security bookworm-security/non-free-firmware Sources [796 B]
Holen:8 http://security.debian.org/debian-security bookworm-security/main amd64 Packages [291 kB]
Holen:9 http://security.debian.org/debian-security bookworm-security/main Translation-en [176 kB]
Holen:10 http://security.debian.org/debian-security bookworm-security/non-free-firmware amd64 Packages [688 B]
Holen:11 http://deb.debian.org/debian bookworm/main amd64 Packages [8.792 kB]
Holen:12 http://deb.debian.org/debian bookworm/main Translation-en [6.108 kB]
Holen:13 http://deb.debian.org/debian bookworm/non-free-firmware amd64 Packages [6.368 B]
Holen:14 http://deb.debian.org/debian bookworm-updates/main Sources.diff/Index [21,8 kB]
Ign:14 http://deb.debian.org/debian bookworm-updates/main Sources.diff/Index
Holen:15 http://deb.debian.org/debian bookworm-updates/main amd64 Packages.diff/Index [21,8 kB]
Ign:15 http://deb.debian.org/debian bookworm-updates/main amd64 Packages.diff/Index
Holen:16 http://deb.debian.org/debian bookworm-updates/main Translation-en.diff/Index [20,7 kB]
Ign:16 http://deb.debian.org/debian bookworm-updates/main Translation-en.diff/Index
Holen:17 http://deb.debian.org/debian bookworm-updates/main Sources [3.288 B]
Holen:18 http://deb.debian.org/debian bookworm-updates/main amd64 Packages [6.924 B]
Holen:19 http://deb.debian.org/debian bookworm-updates/main Translation-en [5.448 B]
Es wurden 25,4 MB in 6 s geholt (4.312 kB/s).
Paketlisten werden gelesen... Fertig
N: Für das Depot »http://deb.debian.org/debian bookworm InRelease« wurde der »Version«-Wert von »12.11« in »12
```

Figure 5: Installation on Linux: Example

```

~/Dokumente/Output$ sudo ./setup.sh -h
[sudo] Passwort
09:50:48 setup.sh [WAGO] [ > ] Setup started.

Usage:
./setup.sh [ option ] [ component ]

Options:
-h      Print this Help.
-i      Install components
-u      Remove components, but keep the data.
-s      Status of the component.
--deleteData when removing to also remove the associated data for the selected components.

Components:
> wsb
> dcs
> postgres
> all

Examples:
Install all components: sudo ./setup.sh
Remove Solution Builder: sudo ./setup.sh -u wsb
Remove all components and the referenced data: 'sudo ./setup.sh -u all --deleteData'
Show Solution Builder status: sudo ./setup.sh -s wsb
Show status of all components: sudo ./setup.sh -s

When installing postgres (or all), add '--password password' and '--port 32004' for a silent installation of postgresQL.
    
```

Figure 6: Overview of Help on Linux

6.3 Installing the WAGO Solution Builder Plug-in in e!COCKPIT

- ✓ The e!COCKPIT development environment must be installed.
 - ✓ The WAGO Solution Builder Package software must be installed.
1. Open the e!COCKPIT development environment.
 2. In e!COCKPIT, switch to the Backstage view.

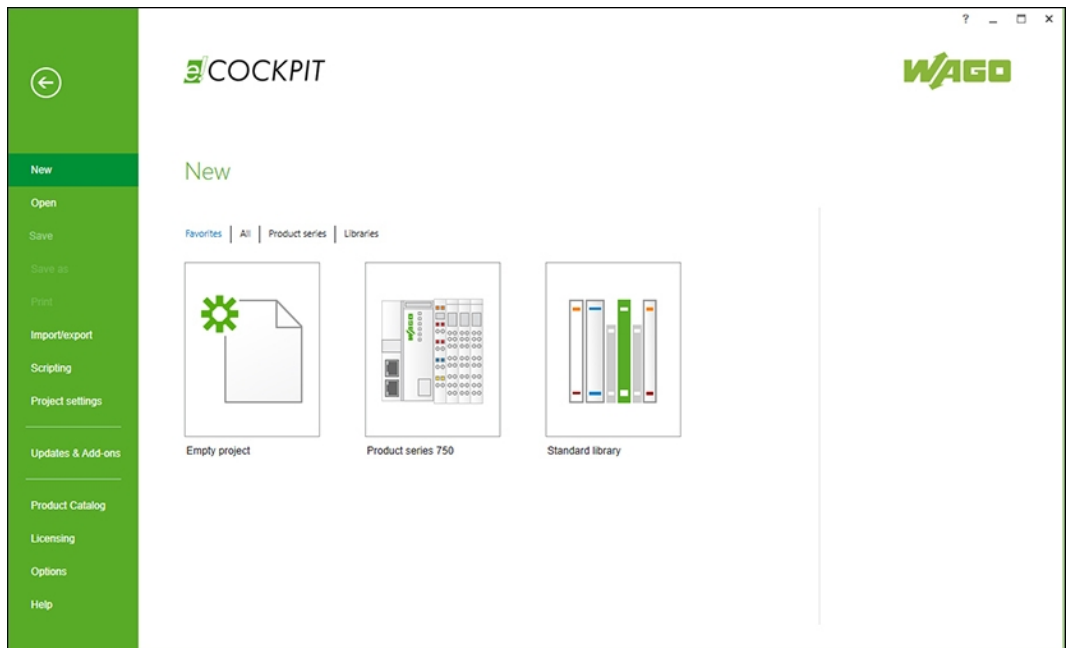


Figure 7: e!COCKPIT Backstage View

3. Go to the "Updates & Add-ons" screen.

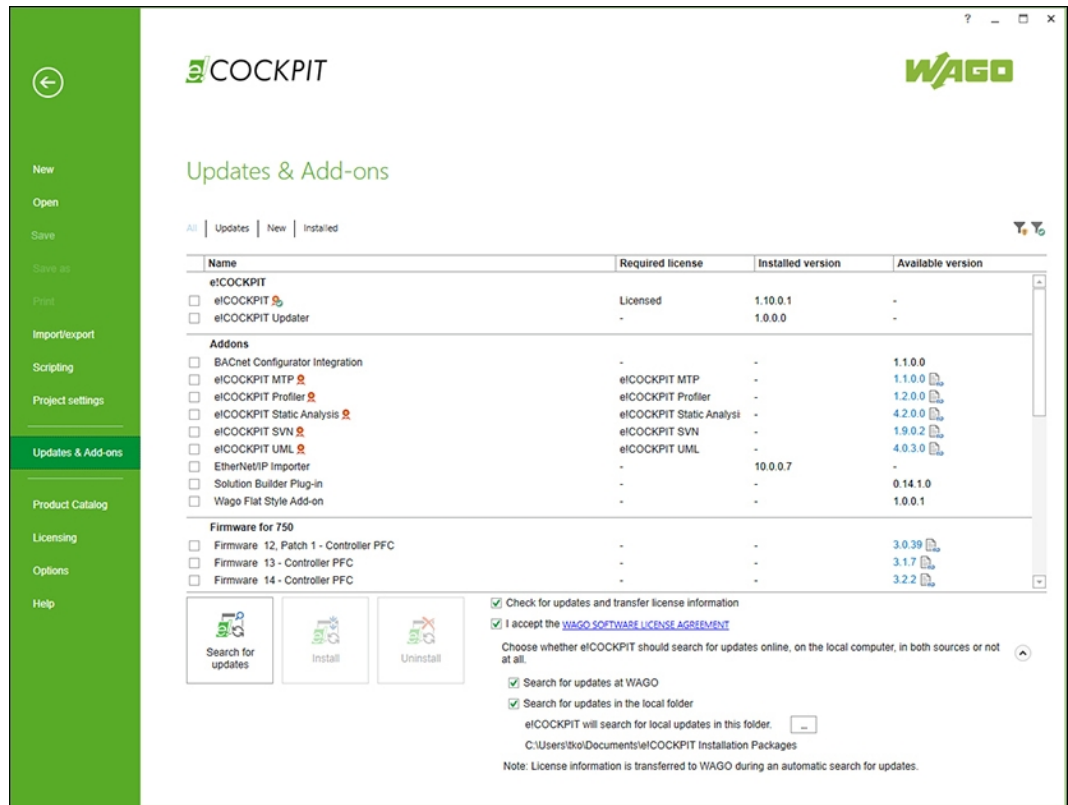


Figure 8: e!COCKPIT Backstage View > “Updates & Add-ons” Screen

4. Accept the WAGO software license agreement.
5. Activate the “Look for updates in local folder” option.

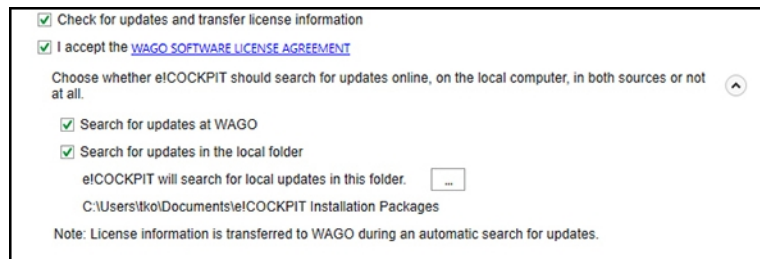


Figure 9: Accepting Installation Terms and Specifying Source Directory

6. Click the button to select the directory of the WAGO Solution Builder Package software package containing the WAGO Solution Builder Plug-in software installation file.
 - ⇒ The WAGO Solution Builder Package software saves the WAGO Solution Builder Plug-in software to the Windows Documents directory by default: *C:\Users\<USER-NAME>\Documents\e!COCKPIT Installation Packages*.
7. In the “Add-ons” list, select “WAGO Solution Builder Plug-in” and check the box.

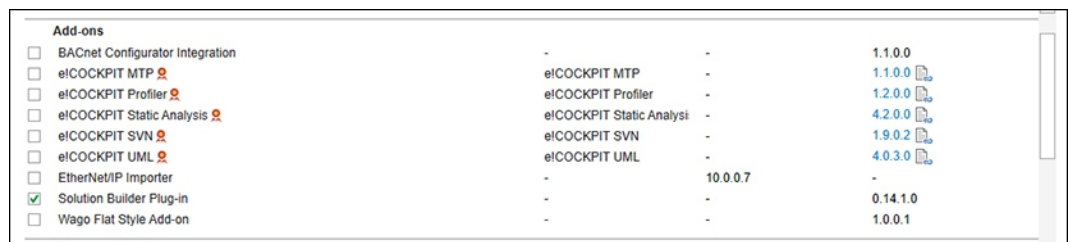


Figure 10: “Add-Ons” List with “WAGO Solution Builder Plug-in” Entry Activated

8. Click the **[Install]** button.
→ The WAGO Solution Builder Plug-in software has been successfully installed.

6.4 Installing the WAGO Solution Builder Plug-in in CODESYS

- ✓ The CODESYS development environment must be installed.
 - ✓ The WAGO Solution Builder Package software must be installed, or the "Solution Builder" add-on must have been downloaded from the download center.
1. As administrator, open the CODESYS installer.
 2. Select the CODESYS installation for which you want to install the WAGO Solution Builder Plug-in software and click **[Change]**.

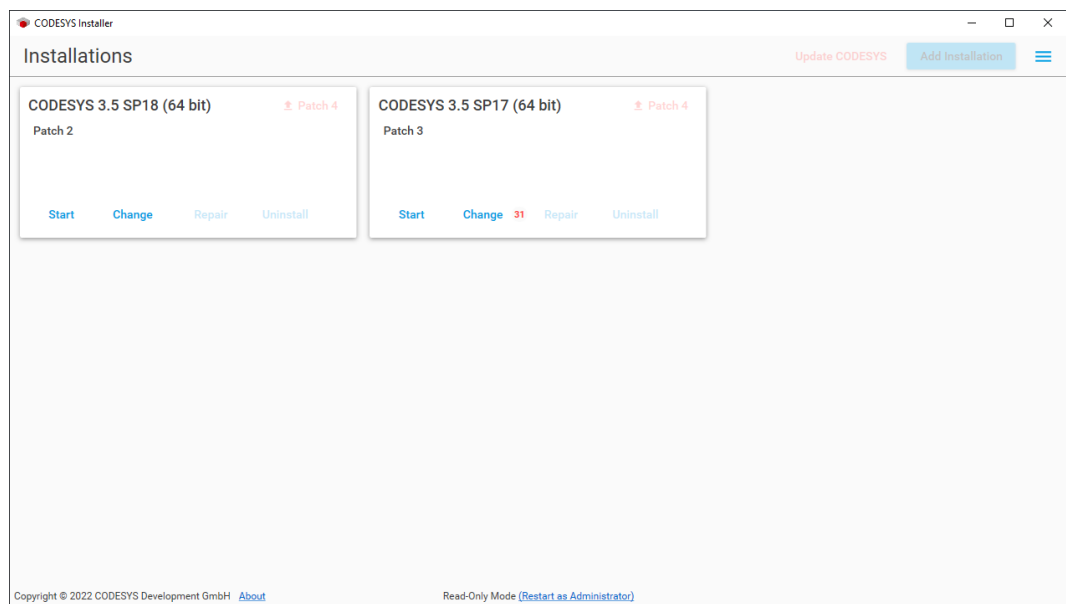


Figure 11: CODESYS Installer: Start View

3. Click **[Install File]** to select the WAGO Solution Builder Package software directory containing the installation file for the WAGO Solution Builder Plug-in software.
⇒ The WAGO Solution Builder Package software saves the WAGO Solution Builder Plug-in software to the Windows Documents directory by default: `C:\Users\<USER-NAME>\Documents\e!COCKPIT Installation Packages`.

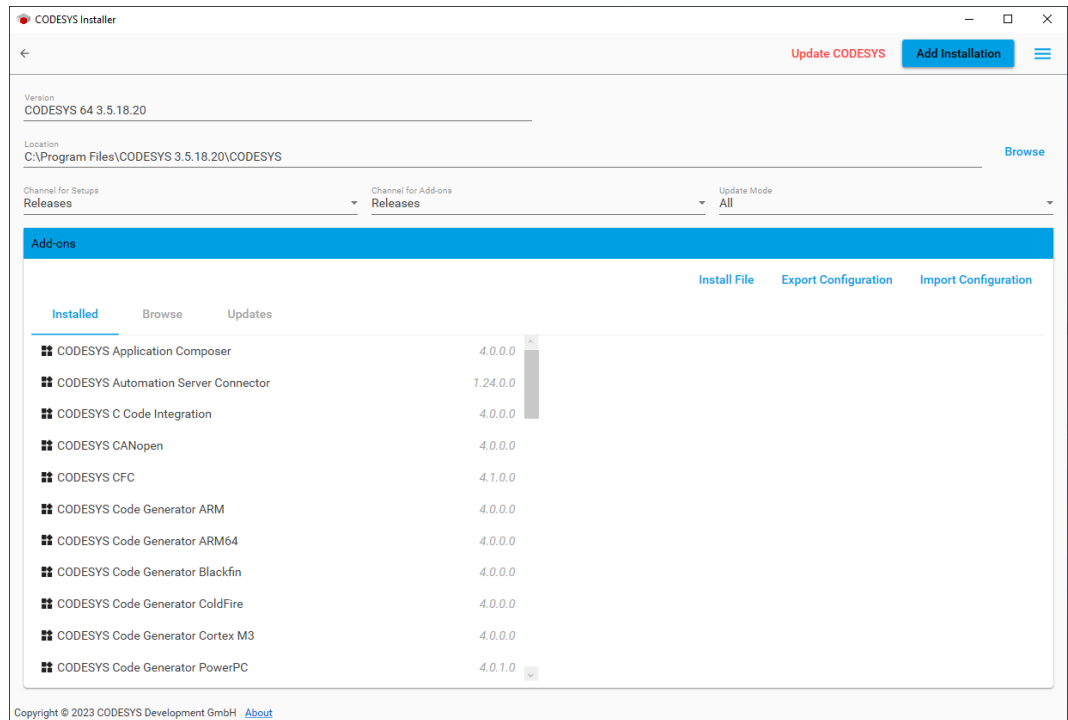


Figure 12: CODESYS Installer: Start View > "Change" Page

4. Accept the WAGO Software License Agreement and click **[Continue]**.
 ⇒ The installation starts.

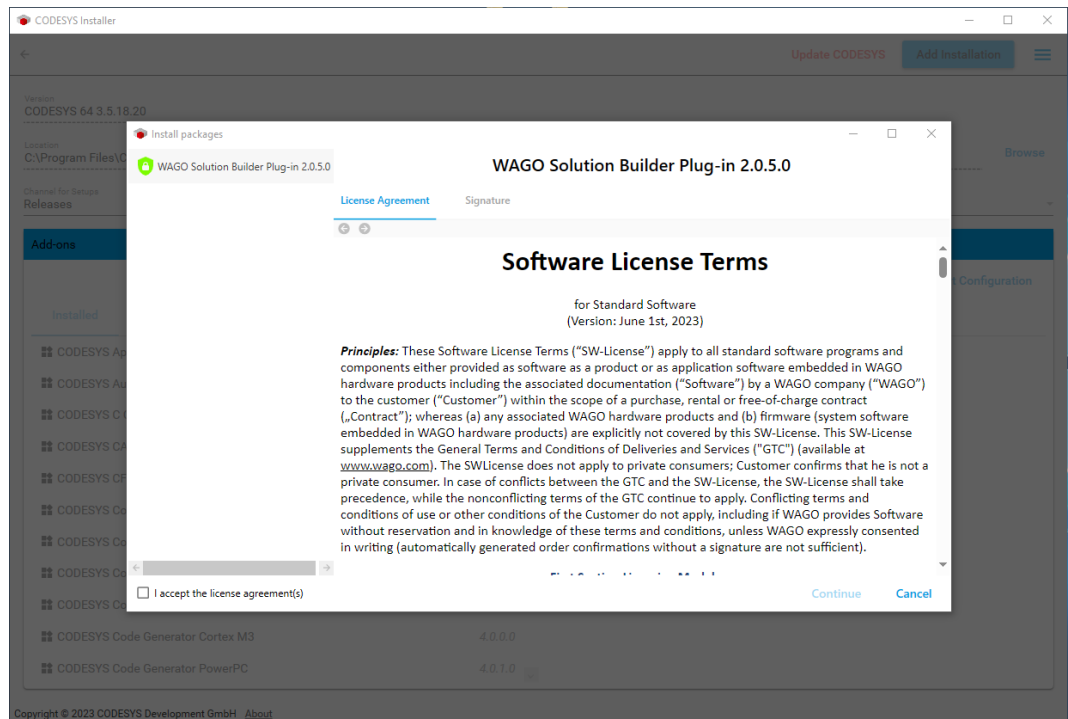


Figure 13: CODESYS Installer: Accepting the WAGO Software License Agreement

5. Finally, verify that the WAGO Solution Builder Plug-in software is listed under "Add-ons."

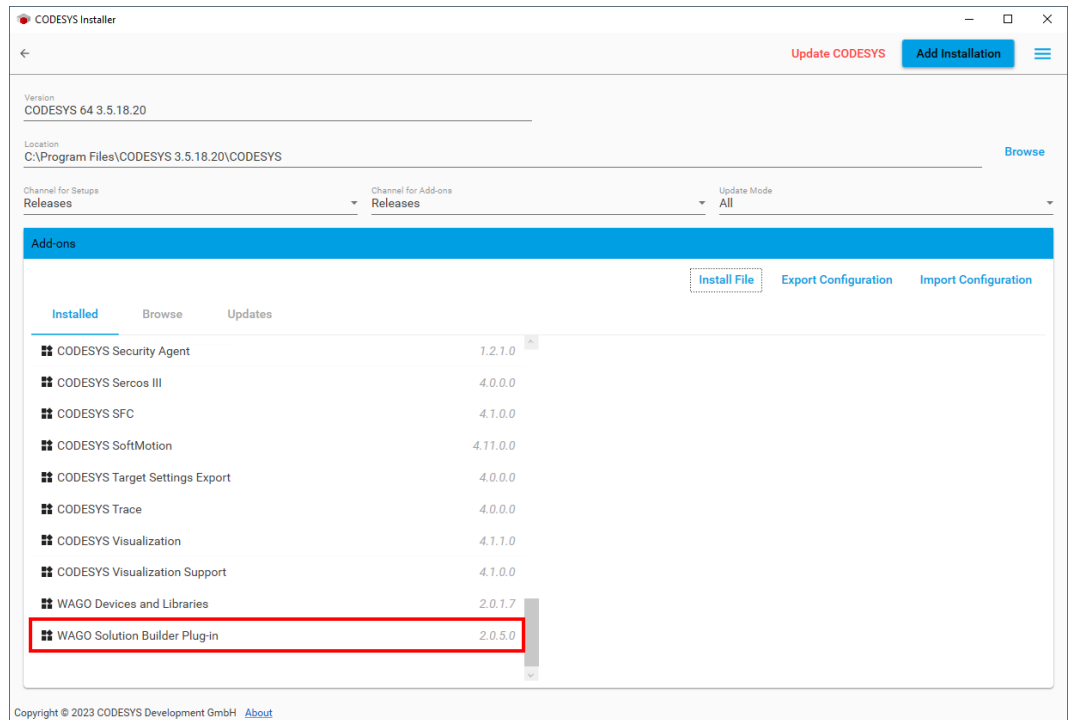


Figure 14: CODESYS Installer: WAGO Solution Builder Plug-in Software Successfully Installed

➔ The WAGO Solution Builder Plug-in software has been successfully installed.

6.5 Security Configuration

The following WAGO Solution Builder software components can communicate with on another securely, i.e., through encrypted communication, when configured accordingly:

- Web browser (with the WAGO Solution Builder software’s graphical user interface)
- WAGO Solution Builder server
- Device Communication Server
- PostgreSQL database server

This requires corresponding certificate files and correct configuration of the individual components. The installation process can optionally generate the initial setup for encrypted communication and appropriate certificates. These certificates are considered “temporary” and serve to illustrate functional certificate-based encryption.

The following certificates are generated during the installation process:

Table 8: Certificates Generated during the Installation Process

Certificate	Filename	Description
1	WAGO_Solution_Builder_Installer.pem	Private key and certificate of the “root CA” in one file
2	WAGO_Solution_Builder_Installer.crt	Certificate of the “root CA,” extracted from the .pem file
3	server.key	Private key of a server
4	server.crt	Certificate of a server

The files are stored in the **C:\ProgramData\WAGO Software\WAGO Solution Builder\Certificates** folder and used in the corresponding component configurations. The "root CA" certificate is automatically imported into Windows Certificate Manager as a "trusted certificate." This is necessary in order for the server certificates that have been generated to be accepted in the components and the various browsers.

As soon as the WAGO Solution Builder software is put into productive use, public certificates provided by your company's IT department should be used. In this productive environment, the following files are required (also see the table):

- **WAGO_Solution_Builder_Installer.crt**
- **server.key**
- **server.crt**

These three files must be copied to each server or physically present there. In addition, your IT department should ensure that you have trusted "root CA" certificates saved. For security reasons, the certificate imported during the installation process should be removed at the end.

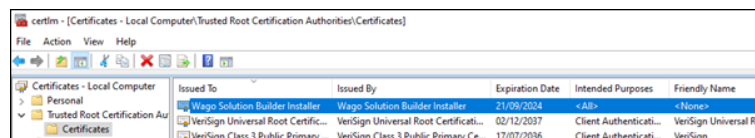


Figure 15: Trusted "Root CA" Certificates in Certificate Manager

Two alternatives exist for configuring a productive environment:

1. Store the official certificate files in the certificate folder under the existing names. This requires no changes to the server configurations.
2. Leave the names of the official certificate files as they are and adjust the file paths in the server configurations.

The possible server configurations are as follows:

Table 9: Possible Server Configurations

Server	Path	Description
WAGO Solution Builder	C:\ProgramData\WAGO Software\ WAGO Solution Builder\ WSB\Config\customSecurity.json	Replace "Path" and "KeyPath" with your own filenames. Here you can also set the URL where the WAGO Solution Builder software can be reached. The "Common Name (CN)" of the server certificate used must match the "SYSTEM USERNAME" in the PostgreSQL configuration.
WAGO Device Communication Server	C:\ProgramData\WAGO Software\ WAGO Solution Builder\ DCS\Config\customSecurity.json	Replace "Path" and "KeyPath" with your own filenames. Here you can also set the URL where the WAGO Device Communication Service can be reached.
WAGO Solution Builder PostgreSQL Database	C:\ProgramData\WAGO Software\ WAGO Solution Builder\ postgres\data\postgresql.conf	On the lines with <i>ssl_ca_file</i> , <i>ssl_cert_file</i> and <i>ssl_key_file</i> , replace the paths with you own filenames.
	C:\ProgramData\WAGO Software\ WAGO Solution Builder\ postgres\data\pg_ident.conf	The name under "SYSTEM USERNAME" corresponds to the "Common Name (CN)" of the accessing server certificate. This name must be identical to the WAGO Solution Builder software's server certificate. The "localhost" row can be deleted.

Server	Path	Description
	C:\ProgramData\WAGO Software\ WAGO Solution Builder\ postgres\data\pg_hba.conf	This defines the access types. The line of type "hostssl" is relevant for encrypted access. The remaining lines are for local access with password protection. These lines can also be deleted if necessary.

Every time a change is made, the corresponding service must be restarted. To do so, open the "Services" program and restart it.

WAGO Device Communication Service	Running	Automatic
WAGO Legacy Communication Service	Running	Automatic
WAGO Solution Builder	Running	Automatic
WAGO Solution Builder PostgreSQL	Running	Automatic

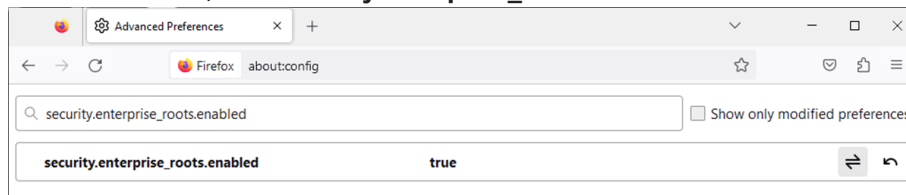
Figure 16: "Services" Program

Information on Secure Browser Access to the WAGO Solution Builder Software

The *Edge* and *Chrome* browsers use Windows Certificate Manager to verify a certificate without any further settings. In the *Firefox* browser, access to Windows Certificate Manager must be explicitly enabled. Every time a new certificate is installed, the *Firefox* browser must be restarted so a new "root CA" can be recognized.

Firefox configuration steps:

1. Enter **about:config** in the address bar.
2. A message appears describing possible risks; click the button to accept.
3. In the "Filter" line, enter **security.enterprise_roots.enabled**.



4. Set the parameter to **true**.
5. Restart.

7 Start

7.1 Opening WAGO Solution Builder via Web Browser

1. Launch the WAGO Solution Builder software via **Start > Programs > "WAGO Software" > "WAGO Solution Builder"** or the shortcut on your desktop.
 - ⇒ The software opens in a Web browser that is installed on the PC running it and is set as the default browser.

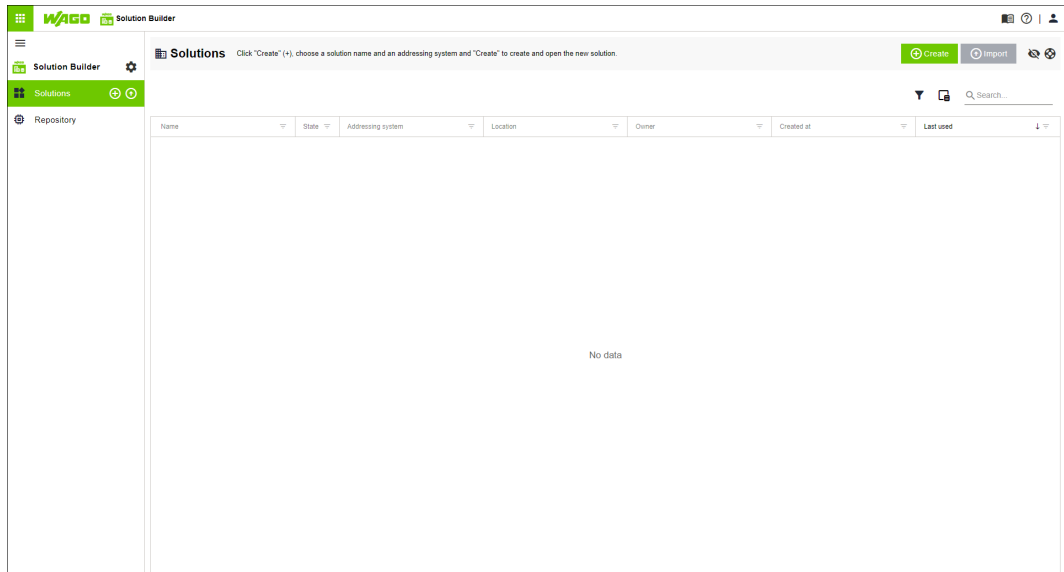


Figure 17: WAGO Solution Builder: Start Screen

2. Click **[Create]**.

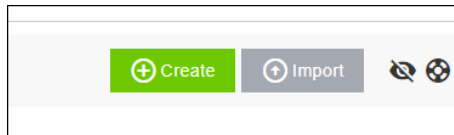
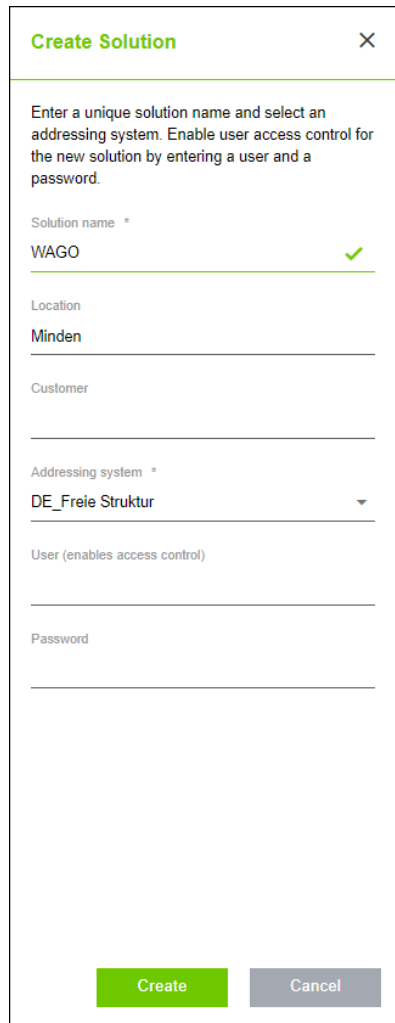


Figure 18: WAGO Solution Builder: Start Screen – Buttons

- ⇒ The "Create Solution" dialog opens.



Create Solution ×

Enter a unique solution name and select an addressing system. Enable user access control for the new solution by entering a user and a password.

Solution name *
WAGO ✓

Location
Minden

Customer

Addressing system *
DE_Freie Struktur ▼

User (enables access control)

Password

Create Cancel

Figure 19: "Create Solution" Dialog

3. Fill in the fields according to the information given in section "Create Solution" Dialog.
4. Click **[Create]**.
 - ⇒ The solution is then created.

8 Graphical User Interface

8.1 WAGO Solution Builder

8.1.1 Main Sections

Note

The figures and descriptions below are an example configuration

The figures and descriptions given in the „Graphical User Interface“ section are based on a sample configuration.

Your configuration and the contents displayed can differ from that shown here.

The graphical user interface can be divided into six main sections; in some cases, these display different content depending on the options selected: The graphical user interface has the following structure:

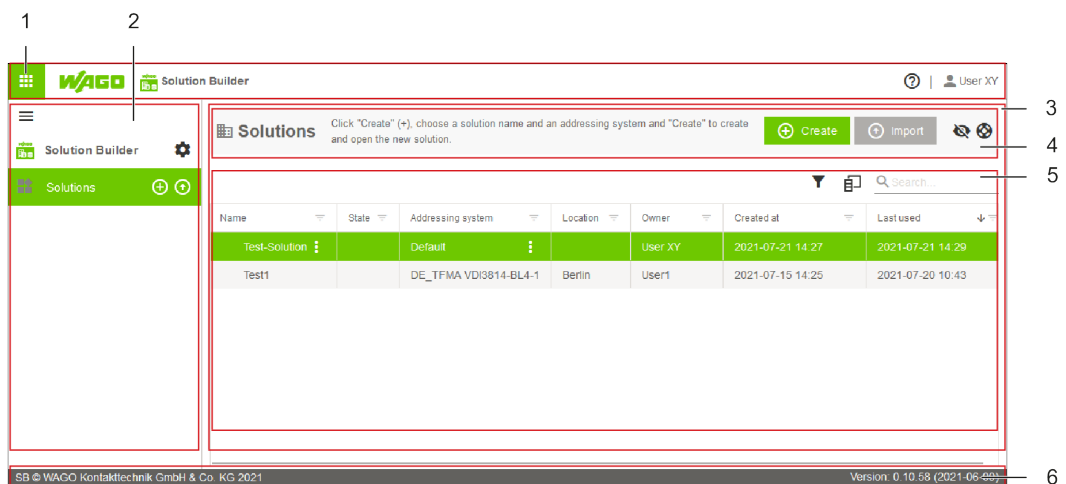


Figure 20: Basic Structure of the WAGO Solution Builder Software Graphical User Interface – Main Areas

Position	Designation	Description
1	Header Bar	Shows information about user currently logged in and the current location path and contains icons for Help and the Start screen. For more information, see Header Bar [p. 33] .
2	Side Menu	Used for navigating through the selected application. For more information, see Side Menu [p. 33] .
3	Workspace	Shows the contents of a solution. The contents of the workspace depend on the selection in the side menu. The workspace is made up of the instruction area and the action area. For more information, see Workspace [p. 39] .
4	Instruction Area	Shows context-sensitive tips and manuals. For more information, see Instruction Area [p. 39] .

Position	Designation	Description
5	Action Area	Within a solution, this area shows the contents of the menu item selected in the side menu. For more information, see Action Area [p. 40] .
6	Footer Bar	Shows general information and version notes. For more information, see Footer Bar [p. 38] .

8.1.1.1 Header Bar

The header bar shows information about the user who is currently logged in and a path to the location of the contents currently being displayed, as well as shortcuts to the product manual, Help function and Start screen. The contents of the footer bar do not depend on the selection in the side menu and action area.

The header bar has the following structure:

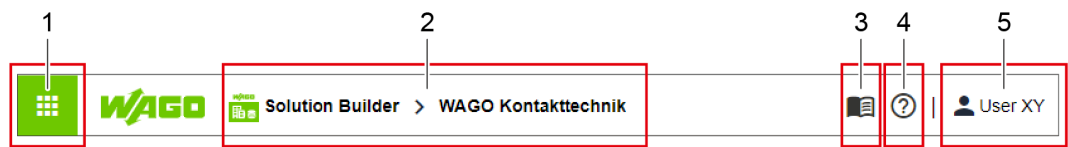


Figure 21: Header Bar

Position	Designation	Description
1	"Back to Start Screen"	Closes the current screen in a solution's action area and the open side menu and returns to the Start screen.
2	Location Path	Shows the solution that is currently open. <i>Example:</i> Once a solution is selected on the Start screen, a corresponding location path appears in the header bar, indicating the solution that is currently open.
(-)	Certificate Info (optional)	Indicates that existing server certificates will expire in less than one month.
3	Product Manual	Opens the product manual in PDF format.
4	Help/F1	Opens the context-sensitive Help function for the contents shown in the action area. Note: Context-sensitive Help may differ! Depending on whether the connection status is online or offline, different versions of the Help may be displayed. If there is an Internet connection, the WAGO Solution Builder software retrieves the latest available help from an external server. If there is no Internet connection, the software retrieves the embedded Help.
5	User	Indicates the user who is currently logged in.

8.1.1.2 Side Menu

The side menu can have one of two states: either open or closed. Both of these states are described below.




8.1.1.2.1 Side menu closed

On the Start screen, the side menu is closed (collapsed) and contains the two menus **Settings** and **Solutions**.

The side menu is structured as follows in the Start screen:



Figure 22: Side Menu Closed (Collapsed)

Position	Designation	Description
1	"Settings" Menu	 Opens the settings dialog for the Software. For more information, see "Settings" Menu [> 46] .
2	"Solutions" Menu	Closed (collapsed) "Solutions" menu; when open (expanded), it contains all menu items for managing solutions and devices. For more information, see Side menu open [> 35] .
		 Creates a new solution. Opens the "Create Solution" dialog. For more information, see "Create Solution" Dialog [> 36] .
		 Imports an existing solution. Opens the "Import Solution" dialog. For more information, see "Import Solution" Dialog [> 37] .
3	"Repository" Menu	Storage location and management of firmware versions for the supported controllers. For more information, see "Repository" Menu [> 114] .

8.1.1.2.2 Side menu open

The opened side menu is displayed when a solution has been selected. The **Settings** continues to be available when the side menu is opened.

The opened side menu is structured as follows:

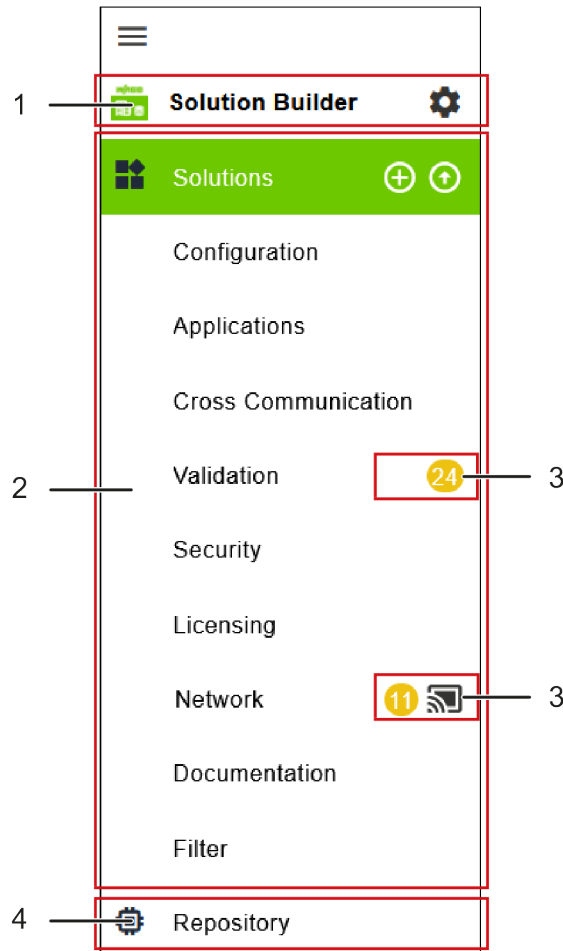





Figure 23: Side Menu Open

Position	Designation	Description
1	"Settings" Menu	 Opens the settings dialog for the Software. For more information, see "Settings" Menu [p. 46] .
2	"Solutions" Menu	Open (expanded) "Solutions" menu with all menu items for managing and configuring solutions and devices. For more information, see "Solutions" Menu [p. 53] .
		 Creates a new solution. Opens the "Create Solution" dialog. For more information, see "Create Solution" Dialog [p. 36] .
		 Imports an existing solution. Opens the "Import Solution" dialog. For more information, see "Import Solution" Dialog [p. 37] .

Position	Designation	Description
3	New messages and network connection status	Indicates the number of new messages in the "Validation" and "Network" menu items and the connection status for the solution under the "Network" menu item. You can change the connection status by clicking on the status icon (offline/online). For information about these icons, see "Validation" Menu Item [> 82] and "Network" Menu Item [> 93] .
4	Repository	Storage and management of software packages, such as firmware for the supported controllers. For more information, see "Repository" Menu [> 114] .

8.1.1.2.3 "Create Solution" Dialog

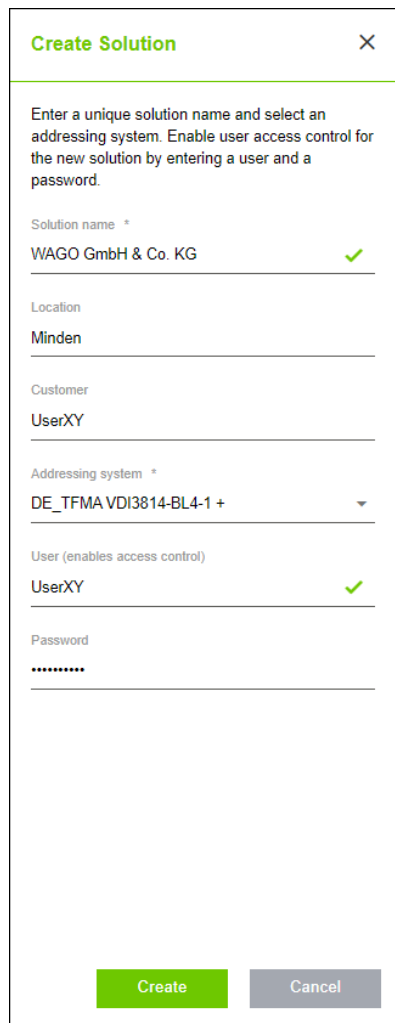


Figure 24: Side Menu > "Create Solution" Dialog

Designation	Description
Solution Name	Name under which the solution should be created in the software.
Location	A location, such as for a device or the solution.
Orderer	Username of the orderer. This can be the username shown in the header bar in the "User" area that was assigned the first time you logged into the solution.

Designation	Description
Addressing System	For selecting the addressing system (see 🔗 "ADDRESSING SYSTEMS" Tab [> 115]).
User (activates access control)	Entering the owner-user in this field activates access control.
Password	For entering the password.

8.1.1.2.4 "Import Solution" Dialog

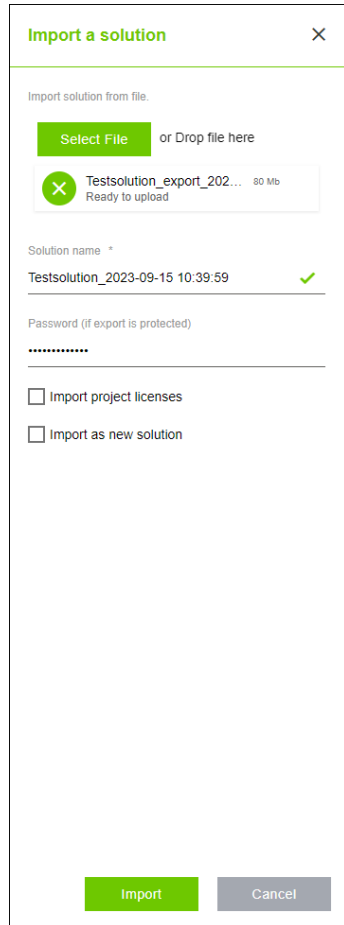


Figure 25: Side Menu > "Import Solutions" Dialog

Designation	Description
[Select file] or drag here	Allows you to add an export file using a standard file selection dialog or by dragging the export file into the field.
Solution Name	Name under which the solution should be created in the Software. This name may differ from the original name in the export file.
Password (when Export is protected)	For entering the password for the export file if the export file is password-protected.
Import Back to Start Screen	Includes all existing project licenses.
Import as New Solution	Adds the solution import as a "new solution" (see 🔗 "Import Solution" Dialog: Different Options for Importing [> 38]).
[Import]	Starts the import.
[Abort]	Cancels the operation.

You can find more information in:

[🔗 “Export Solution” Dialog \[▶ 56\]](#)

8.1.1.2.4.1 “Import Solution” Dialog: Different Options for Importing

An existing solution can be imported into the WAGO Solution Builder software in two different ways:

- **Option 1: “Import as New Solution”**
- **Option 2: “Import as Snapshot”**

Option 1: “Import as New Solution”

Requirement: The “Import as New Solution” box is checked (see [🔗 “Import Solution” Dialog \[▶ 37\]](#)).

The solution is added to the tree structure on the same level as existing solutions. This procedure is especially appropriate if you want to add a standalone solution in the action area.

Option 2: “Import as Snapshot”

Requirement: The “Import as New Solution” box is unchecked (see [🔗 “Import Solution” Dialog \[▶ 37\]](#)).

The solution is added to the tree structure as an element subordinate to an existing solution. This procedure is especially appropriate if two different versions of a solution exist (a working version and an original version), and you want to assign the working version to the original version. The two versions then appear one below the other in the action area.

Example:

A “Building Complex XY” solution is created in a planning agency. This solution now needs to be handed over to colleagues at the construction site. To do so, the solution is exported via “Export Solution” Dialog. The function provides the solution with a unique ID. Changes are now made to this “Building Complex XY” solution at the construction site. These changes are saved in a working version and returned to colleagues in the agency. Using the “Import as Snapshot” option, it is now possible to represent both versions (working and original versions) in the existing tree structure one below the other. The imported working version can also be promoted to the “active version” via **[Restore Snapshot]** (see [🔗 “Solutions” Menu Item \[▶ 54\]](#)).

Name	State	Comment
<div style="background-color: #008000; color: white; padding: 2px;"> ▼ Gebäudekomplex XY </div>	🔒	
Gebäudekomplex XY_2023-09-15 11:22:38		

Figure 26: Example: “Import as Snapshot”

8.1.1.3 Footer Bar

The footer bar contains general information about the Software. The contents of the footer bar do not depend on the selection in the side menu and action area.

The footer bar has the following structure:

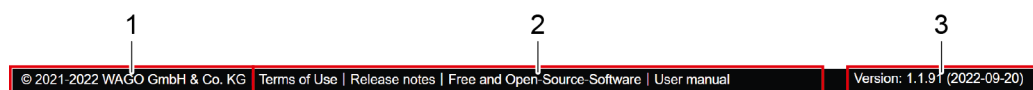


Figure 27: Footer Bar

Position	Designation	Description
1	Publisher	Shows the Software publisher, along with the year of publication.
2	Links	Shows links to additional information.
3	Software Version	Shows the Software version currently in use.

8.1.1.4 Workspace

The workspace is divided into the “instruction area” and the “action area”.

Instruction area

The instruction area is intended as a getting-started aid for using the Software and can be completely deactivated at any time.

Action area

The action area displays the contents and setting options for solutions. Presentation in the action area is based on the menu item selected in the side menu.

Both subsections of the workspace are described in detail below.

8.1.1.4.1 Instruction Area

The instruction area provides assistance in using the Software’s graphical user interface. In addition to the instruction texts and tips displayed in the instruction area, the pop-up Help function can also be activated. This function offers additional information and short descriptions of the individual functions of the graphical user interface. You can enable/disable both of these support functions at any time.

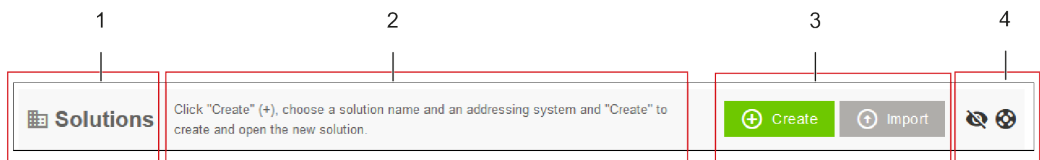


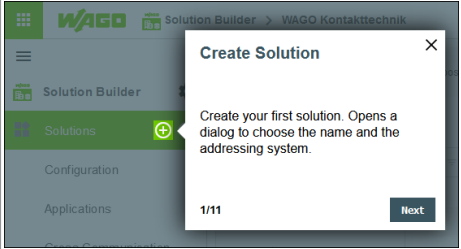





Figure 28: Workspace > Instruction Area


Position	Designation	Description
1	Name of Selected Menu Item	Shows the name of the menu item selected in the side menu. Specific instruction text appears for each menu item.
2	Instruction Text	Shows tips and instructions for each menu item selected in the side menu.
3	Shortcuts	Shows shortcuts for each instruction text to help you directly get to your destination. The contents of this area always depend on the instruction text that is displayed.
4	Hide Instruction Area	 Hides the instruction area. For some examples of instructions displayed for different menu items, see section “Instruction Examples directly after this table.” The instruction area can be turned back on in the “Settings” menu (see “User Settings” Area [p. 49]).



Position	Designation	Description
	Enabling/Disabling the Pop-up Help	 <p>Highlights individual user interface functions one after the other and also shows tooltips in addition for the instruction area. The tooltips offer guidance and short descriptions.</p> 


Example Instructions

 **Solutions** Click "Create" (+), choose a solution name and an addressing system and "Create" to create and open the new solution.

 **Security** Best security is when all items are "green". Click on a button to enable this security option.

 **Licensing** Add, delete and assign licenses to controllers. Check license requirements in "Solution licenses".






Figure 29: Example Instructions

8.1.1.4.2 Action Area

Presentation of the action area is based on the menu item selected in the side menu.

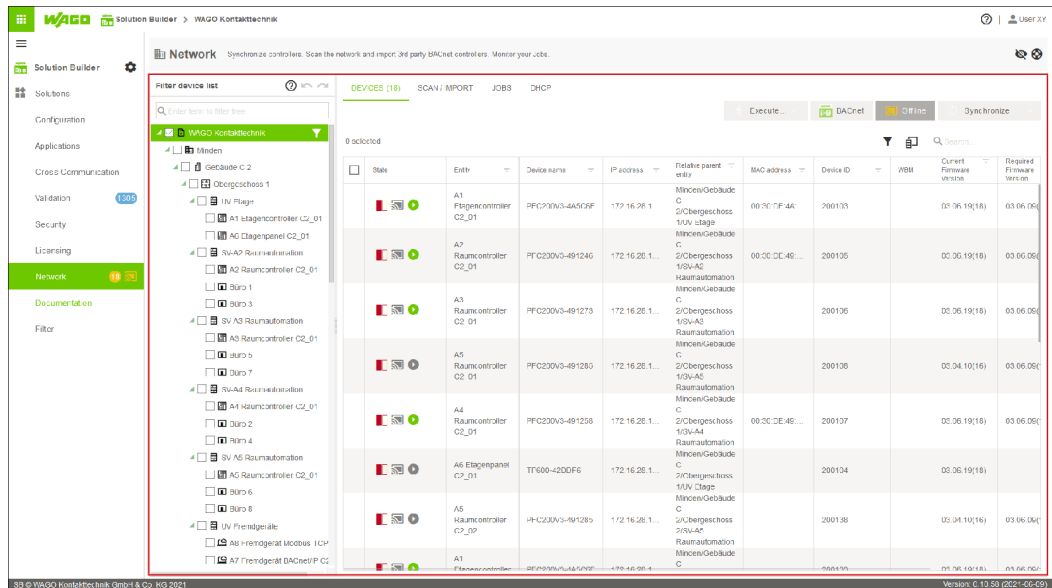


Figure 30: Workspace > Action Area > Example "Menu Item" "Network"

The action area is described for each individual menu item under  **Side Menu** [\[> 46\]](#).

8.1.1.4.2.1 Entity Tree

The following menu items of the side menu possess a structure tree within the action area for selecting an entity.

- [🏠 “Configuration” Menu Item \[> 57\]](#)
- [🏠 “Applications” Menu Item \[> 78\]](#)
- [🏠 “Cross-Communication” Menu Item \[> 79\]](#)
- [🏠 “Validation” Menu Item \[> 82\]](#)
- [🏠 “Network” Menu Item \[> 93\]](#)
- [🏠 “Documentation” Menu Item \[> 110\]](#)
- [🏠 “Filter” Menu Item \[> 112\]](#)

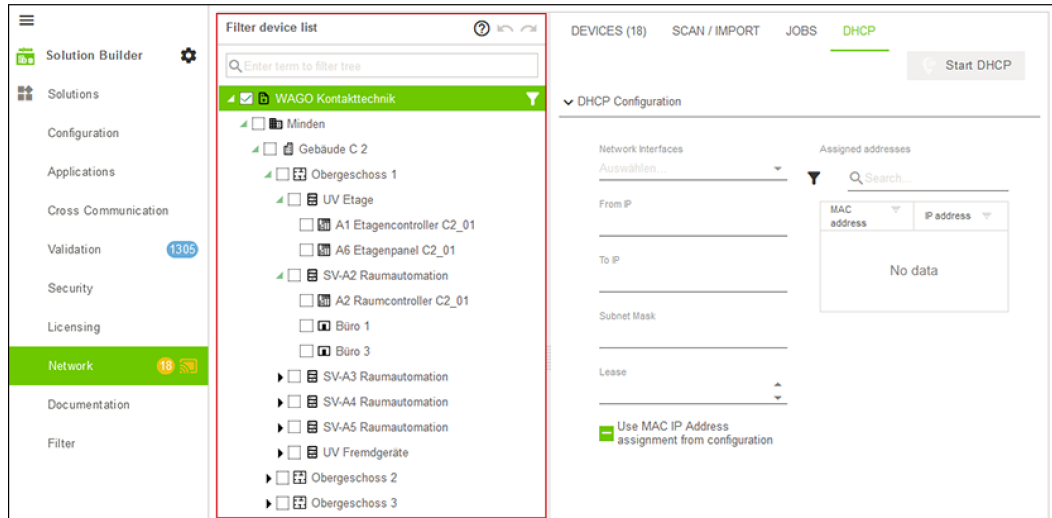





Figure 31: Action Area > Entity Tree

Some available entities are listed below with their associated icons for the example of the “DE_TFMA VDI3814-BL4-1” addressing system supplied with this product.

Table 10: Entity Tree – Entities with Icons

Icon	Entity
	Equipment
	Application instance
	Automation focal point
	Equipment
	Controller
	Third-party controller
	Data point
	Floor
	Building
	Building system
	Property
	Room

Icon	Entity
	Solution
	Assembly
	Controller

Note

Freely configurable entity representation

The entities shown here serve only as examples. With the editor, detailed settings can be made, and an entity's icon can be customized (see [Structure Editor](#) [**> 117**]).

8.1.1.4.2.2 Entity Path

In the "CONFIGURATION" menu item, selection of the entity in the structure tree is also shown as a path in the action area on the tabs.

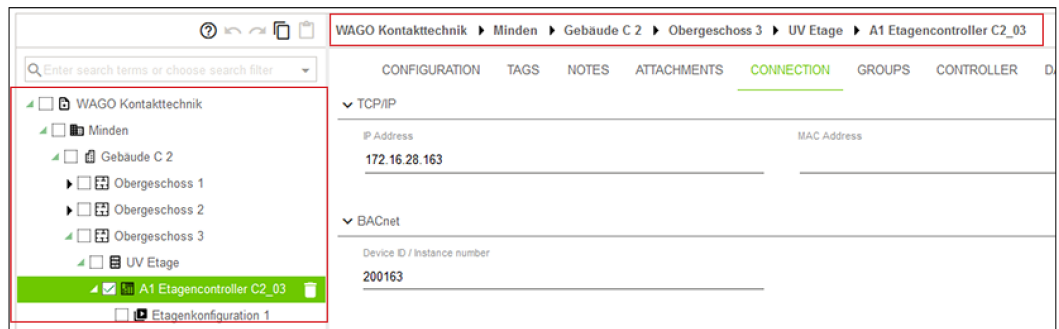










Figure 32: Correlation between entity tree and entity path




















8.1.2 General Operating Elements and Icons


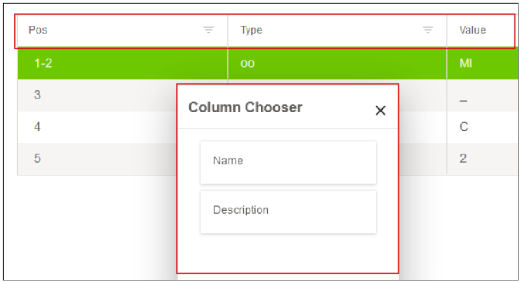




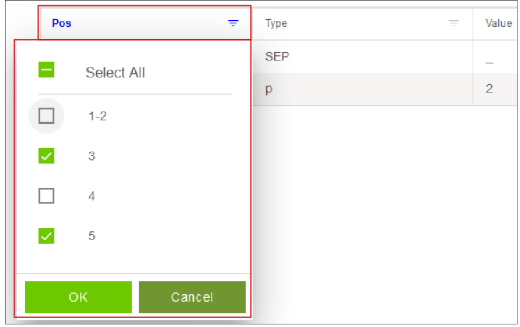

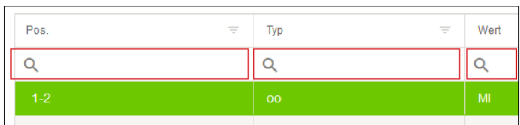







The general icons listed below can appear in the graphical user interface.





Besides the descriptions in this product manual, nearly every one of the icons listed here offers a tooltip with a brief description right in the user interface.

Table 11: General Operating Elements and Icons in the Graphical User Interface

Symbol	Designation	Description
	Back to Start screen	Closes the current solution and returns to the Start screen.
	Minimize/maximize side menu	Collapses/expands the side menu.
	Back to previous screen	Exits the current screen in the action area and returns to the previous screen.
	Cancel operation without saving	Cancels an operation without saving any changes that may have been made.
	Online documentation	Opens the context-sensitive online Help function.
	Hide item	Hides an area or individual item in the graphical user interface.
	Show item	Unhides an area or an individual item in the graphical user interface.
	Pop-up Help	Activates the pop-up Help function.

Symbol	Designation	Description
	Export data	Exports all files in xlsx format.
	Save data/changes	Saves all changes that have been made.
	Save as new structure definition under new name	
	Solution locked	The solution is write-protected to prevent accidental editing.
	Copy properties to clipboard	Starts the process of copying properties to the clipboard.
	Paste properties from clipboard	Opens the contents saved to the clipboard to select them for pasting.
	Manually defined value	Indicates a manually defined value. Note: The value specified is then not calculated automatically by the software's internal mechanisms. Clicking the [Recalculate] button cancels this. For more information, see section "ADDRESSING" Tab [> 57] .
	Delete item	Deletes one or more marked items.
	Import user data	Imports usernames from an external authentication system. For more information, see section "Access Control" Dialog [> 87] .
	Add item	Creates a new item.
	Add new option	Adds a new option to the structure editor.
	Add new license manually	Opens a dialog to manually add a new license to a controller (see "LICENSES" Tab [> 69]).
	Back to previous step	Goes one step back and cancels the last change that was made.
	Go to next step	Goes one step forward if the "Back to previous step" function was used previously.
	Freeze current screen	Freezes a screen so it remains visible even when a different item is selected in the tree structure.
	Export entity tree	Exports the selected elements of the entity tree as a structured "Solution Builder Part Export" file (sbxpart file). For more information on this file, see sbxpart file .
	Import entity tree	Imports the entity tree as a structured "Solution Builder Part Export" file (sbxpart file). For more information on this file, see sbxpart file .
	Read entity properties from Excel	Imports the Entity Properties [> 120] from an Excel file.
	Select again	Re-selects the last selection that was made.

Symbol	Designation	Description
	Column selection	Allows you to add more columns, if available, to the table by dragging and dropping them from the "Column Selection" dialog or remove columns from the table by dragging them to the "Column Selection" dialog. 
	Show all IPK packages	Displays an overview of all IPK packages available on the controller. The WAGO Solution Builder software needs to have already connected once to the controller package online to read the package information.
	Edit item	Opens editing mode for a selected item or area.
	Export addressing system	Exports the selected addressing system as a structured "Solution Builder Structure Definition" (sbsd) file. For more information on this file, see sbsd file .
	Filter rows	Sets a filter and shows only the desired rows in a table. 
	Show/hide row filter	Displays a search field in every column to enable column-by-column full-text search. 
	Search field	Searches the entire contents of a table for a search term.
	Column order	Clicking on the column description sorts the list in ascending or descending order.
	Show PDF document	Displays a linked PDF document.
	Duplicate name	Indicates that a name has been assigned more than once.
	Reload device model and update all linked device instances	Reloads the device model and updates all linked device instances.
	Apply device settings from application template	Applies all default device settings from the Application template.
	Renew all or expiring subcertificates	Renews all subcertificates or subcertificates that are expiring.

Symbol	Designation	Description
	Query all BACnet objects cyclically	Starts cyclic reading of the BACnet objects.
	Stop cyclic querying of BACnet objects	Stops cyclic reading of the BACnet objects.
	Download the latest firmware version	Downloads the latest firmware version from the WAGO Download Center .
	Get application template from WAGO Download Center	Downloads a selected Application template from the WAGO Download Center .
	Distribute certificate to all devices with same tag starting with "Certificate [...]"	Distributes a certificate to selected controllers. This requires the controllers to be assigned a tag, which you can define yourself. The tag itself must start with "Certificate:"; after that, it can be defined freely. For more information, see section "CERTIFICATES" Tab [> 75] .

8.1.3 Start View

The Start screen appears immediately after the Software is launched and can be considered a starting point for all other activities.

In the Start screen the action area contains a list of existing solutions (see also ["Solutions" Menu Item \[> 54 \]](#)).

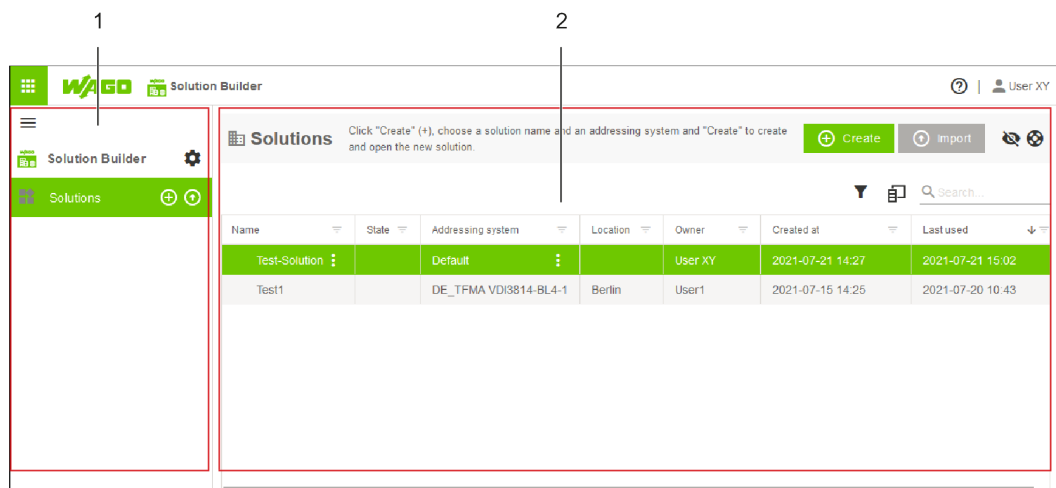


Figure 33: Structure of the User Interface in the "Start Screen" Area

Table 12: Legend for Figure "Structure of the User Interface in the 'Start Screen' Area"

Position	Designation	Description
1	Side menu (closed)	Here you can create a new solution or import an existing one. In the Start screen the side menu does not have any sub-menu items because no solution has yet been selected in the action area. You can find further information in "Side Menu [> 33] .
2	Workspace	Displays the two sections of the workspace: <ul style="list-style-type: none"> • Instruction area • Action area Shows a list of existing solutions in the action area. You can find further information in "Workspace [> 39] .

8.1.4 Side Menu

Information about the structure and the icon legend for the side menu is given under [Side Menu \[> 33 \]](#).

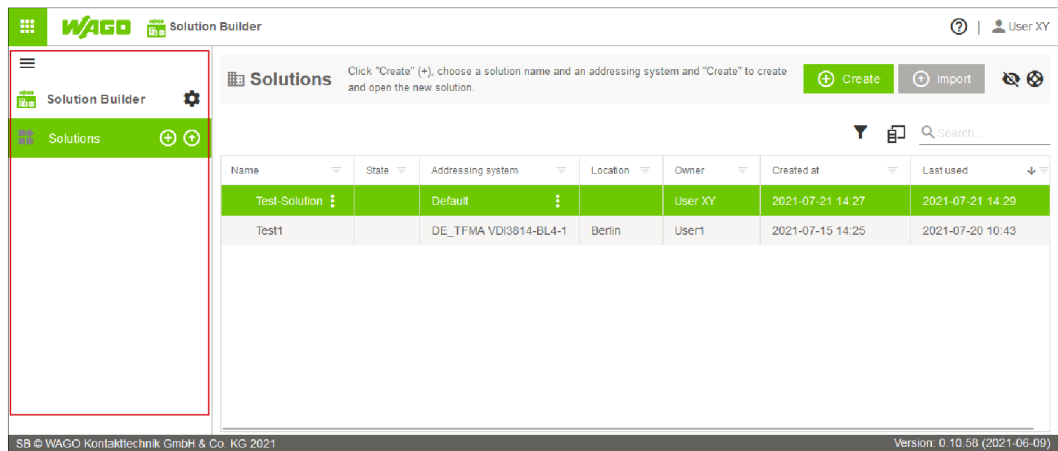


Figure 34: Side Menu

The contents of the two main menus (“[Settings \[> 46 \]](#)” and “[Solutions \[> 53 \]](#)”) of the side menu and their submenus are described in detail below.

8.1.4.1 “Settings” Menu

Note

Settings are saved locally in the Web browser in the form of cookies

All settings, except for “System Settings” and “System Information,” which are saved globally, are saved as cookies in the Web browser currently being used. These settings are lost if the cookies are deleted.

The **Settings** menu is divided into five areas.



Figure 35: Side Menu > Settings > Overview of Areas (Collapsed)

8.1.4.1.1 “Regional Settings” Area

In the “Regional Settings” area, you can set the language for the Software’s graphical user interface. You can also customize the date and time format.

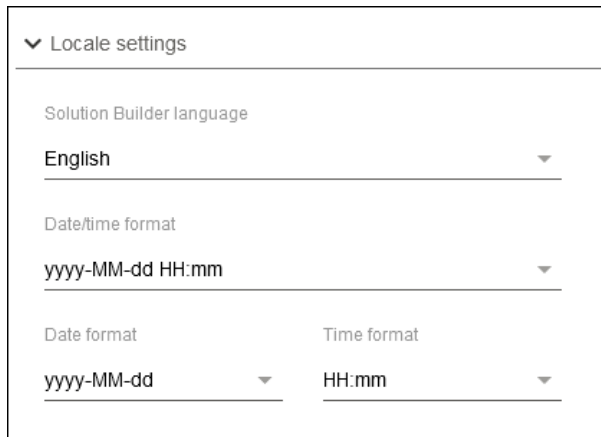


Figure 36: Side Menu > Settings > "Regional Settings" Area

Note

The language depends on the addressing system

The language for the Software's graphical user interface can be selected in the "Regional Settings" area. The language on the individual tabs depends on the **addressing system** that has been selected.

8.1.4.1.2 "Database Settings" Area

In the "Database Settings" area, all settings can be made that relate to the lower-level database.

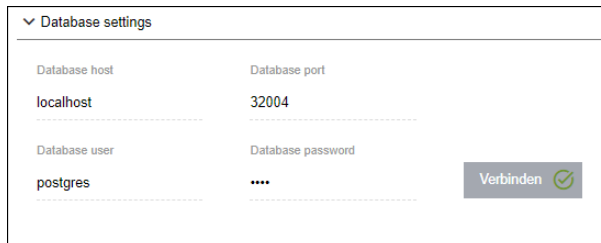


Figure 37: Side Menu > Settings > "Database Settings" Area

Designation	Description
Database Host	For entering the database host (server name or IP address)
Database Port	For entering the database port
Database User	For entering the database user
Database Password	For entering the database password
[Connect]	Connects the Software with the lower-level database.

8.1.4.1.3 "Tree Settings" Area

You can adjust the representation of the tree structure in this area.

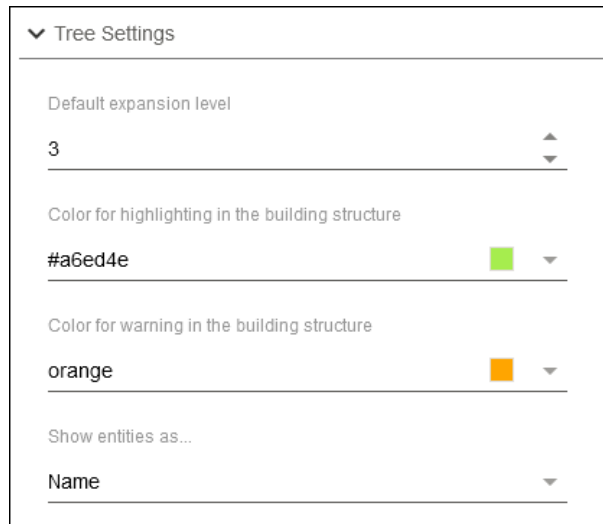


Figure 38: Side Menu > Settings > "Tree Settings" Area

Designation	Description
Standard open levels	Indicates the number of levels opened automatically in the entity tree Start screen.
Color for highlighting in building structure	<p>Configures the color used for highlighting names in the entity tree. At certain points within the entity tree, relationships and interdependencies among multiple entities are indicated by the color of their names.</p>
Warning color in building structure	<p>Configures the color for messages in the entity tree. In the side menu, messages that require the users's attention are marked with a number of entities, which is highlighted in color.</p> <p>For more information on the messages in the side menu, see also Side menu open [> 35].</p>

Designation	Description	
Show entity as ...	Name	Selects the manner in which entities are displayed in the entity tree. Besides the entity name, a partial or full addressing code can also be displayed.
	Complete addressing system code	
	Name (partial addressing system code)	
	Name (complete addressing system code)	

8.1.4.1.4 "User Settings" Area

In this area, you can set or change the username or make settings for storing items and displaying interactive Help texts.

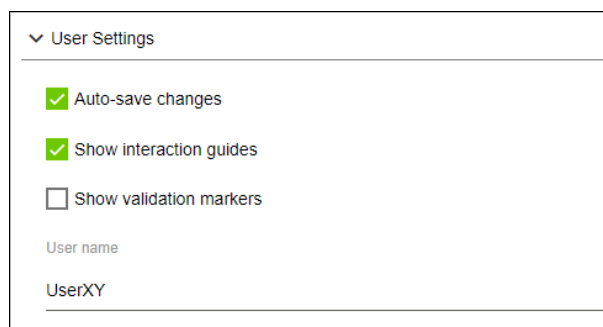


Figure 39: Side Menu > Settings > "User Settings" Area

Designation	Description	
Save changes automatically	<input type="checkbox"/>	Changes must be saved manually at regular intervals or before exiting an area.
	<input checked="" type="checkbox"/>	Changes are saved automatically when you exit a settings area.
Show Instructions	<input type="checkbox"/>	The Instruction area is not activated and does not appear in the workspace.
	<input checked="" type="checkbox"/>	The instruction area is activated and appears in the workspace. For more information, see ☞ Instruction Area [p. 39] .
Show validation markers	<input type="checkbox"/>	The validation markers are hidden (see ☞ Side menu open [p. 35]).
	<input checked="" type="checkbox"/>	The validation markers are unhidden (see ☞ Side menu open [p. 35]).
Username	Here you can enter the username to use for your own entries in the WAGO Solution Builder software.	

8.1.4.1.5 "System Settings" Area

In this area you can define the addresses for the WAGO Device Communication Service and the address for the WAGO Tool Gateway Service.

The addresses in the "System Settings" area will be requested and set during installation. If no changes have been made to the system you do not have to provide any input here.

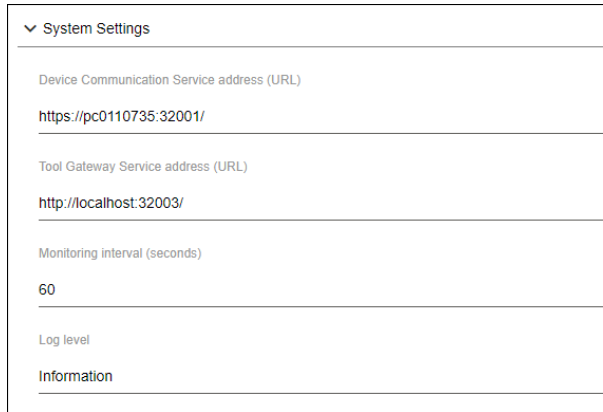


Figure 40: Side Menu > Settings > “System Settings” Area

Designation	Description
Device Communication Service Address	Address at which the WAGO Device Communication Service software can be reached. This service connects the WAGO Solution Builder software to an IP network, which processes the WAGO Solution Builder software’s jobs, has a DHCP server and allows a network to be scanned.
Tool Gateway Service Address	Address at which the WAGO Tool Gateway Service software can be reached. This service connects the WAGO Solution Builder software, the associated WAGO Solution Builder Plug-in software and the WAGO configurators for BACnet, DALI and SMI to one another.
Monitoring interval (seconds)	Here you can enter the monitoring interval (real-time query) for BACnet objects.
Log Level	Here you can select the log files to display (full report or limited report).

8.1.4.1.6 “System Information” Area

In this area you can view all system-relevant information, such as information about the operating system, the software version and storage locations.

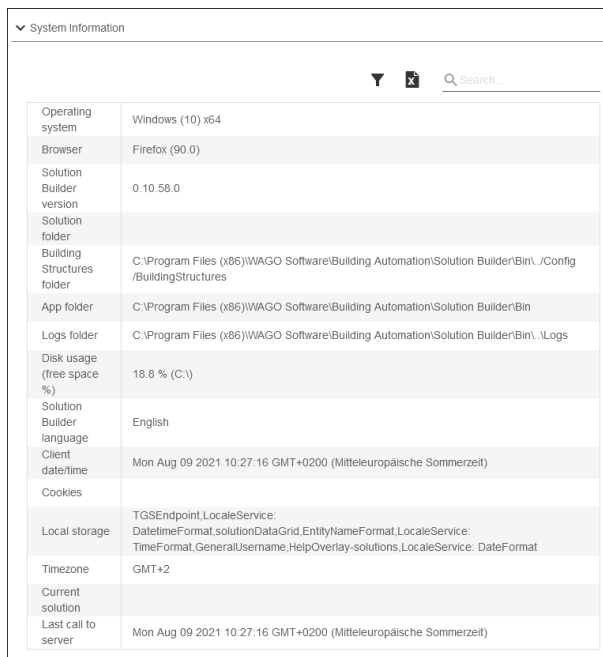


Figure 41: Side Menu > Settings > “System Information” Area

8.1.4.1.7 "Authentication Settings" Area

In the "Authentication Settings" area, you can make login settings and **WAGO Solution Builder user** settings. If an authentication system is selected, user authentication is performed each time the WAGO Solution Builder software is executed.

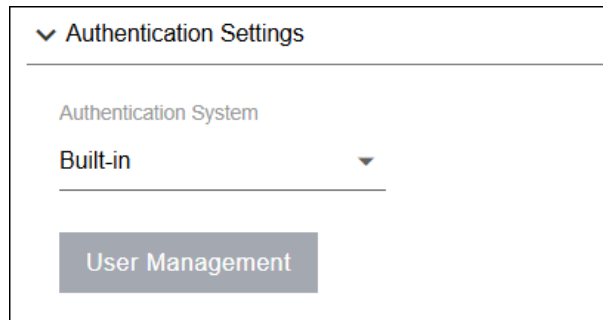


Figure 42: Side Menu > Settings > "Authentication Settings" Area

Designation	Description	
Authentication System	None	User authentication is not performed. Access to WAGO Solution Builder is unprotected.
	Built-in	User authentication is performed via WAGO Solution Builder's built-in user management (see "Built-in" Authentication System [> 51]). The user management itself has a simple role assignment. This requires at least one WAGO Solution Builder user to be created in the "User Management" Dialog [> 52] .
	Lightweight Directory Access Protocol (LDAP)	User authentication uses the company's internal LDAP (see "Lightweight Directory Access Protocol (LDAP) Authentication System [> 53]).
	AD (Active Directory)	User authentication uses the company's internal AD (see "Active Directory (AD)" Authentication System [> 53]).

8.1.4.1.7.1 "Built-in" Authentication System

User authentication is performed via WAGO Solution Builder's built-in user management.

The individual parameters are described in the following sections.

8.1.4.1.7.1.1 "User Management" Dialog

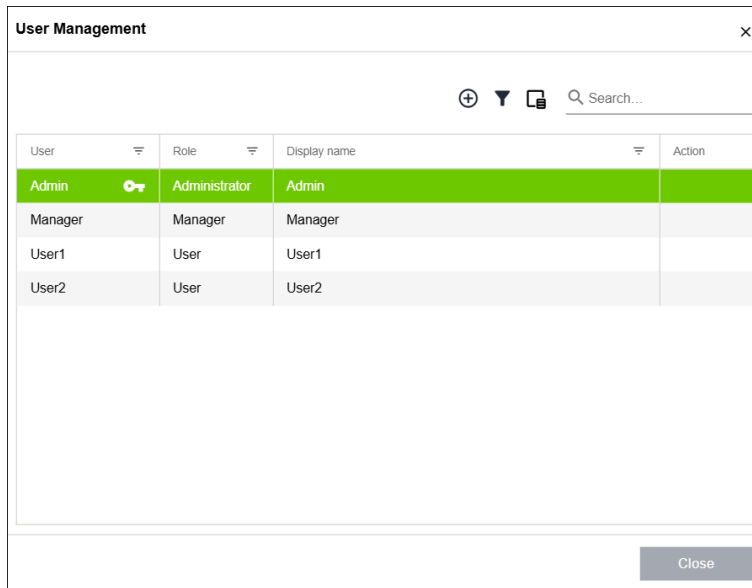


Figure 43: Side Menu > Settings > "Authentication Settings" Area > "User Management" Dialog

Designation	Description
+	Opens the "Add User" Dialog to create a new user.
User	Shows the user that has been created.
Role	Shows the assigned role.
Display Name	Shows the display name that has been created.
Action	Deletes the user that was created.

8.1.4.1.7.1.1.1 "Add User" Dialog

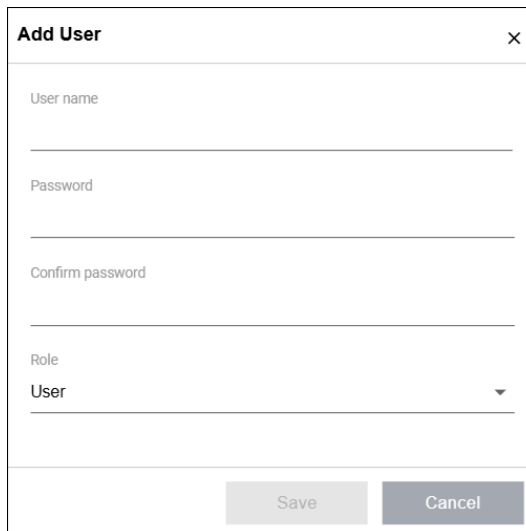


Figure 44: Side Menu > Settings > "Authentication Settings" Area > "User Management" Dialog > "Add User" Dialog

Designation	Description
Username	For entering the username
Password	For entering the password
Confirm password	For reentering the password
Role	For selecting the role:

Designation	Description	
	User	Default user who can open and edit solutions.
	Manager	Identical to the "User" role; can also create new solutions and manage the repository.
	Administrator	Identical to the "Manager" role; can also make system settings, such as managing users.
	Locked	User that has been created whose access is locked.

8.1.4.1.7.2 Lightweight Directory Access Protocol (LDAP) Authentication System

User authentication uses your company's internal IT department's "Lightweight Directory Access Protocol." All the parameters listed correspond to the LDAP standard and are explained in the corresponding specifications.

This requires users from WAGO Solution Builder to be created and assigned in the Lightweight Directory Access Protocol.

The following roles must be created:

- "Administrator" role: *WagoSolutionBuilderAdministrator*
- "Manager" role: *WagoSolutionBuilderManager*
- "User" role: *WagoSolutionBuilderUser*

8.1.4.1.7.3 "Active Directory (AD)" Authentication System

User authentication uses your company's internal IT department's "Active Directory." All the parameters listed correspond to the AD standard and are explained in the corresponding specifications.

This requires users from WAGO Solution Builder to be created and assigned in the Lightweight Directory Access Protocol.

The following roles must be created:

- "Administrator" role: *WagoSolutionBuilderAdministrator*
- "Manager" role: *WagoSolutionBuilderManager*
- "User" role: *WagoSolutionBuilderUser*

8.1.4.2 "Solutions" Menu

The **Solutions** menu in the side menu shows the configuration options for a solution in the action area.

This menu has eleven sub-menu items.

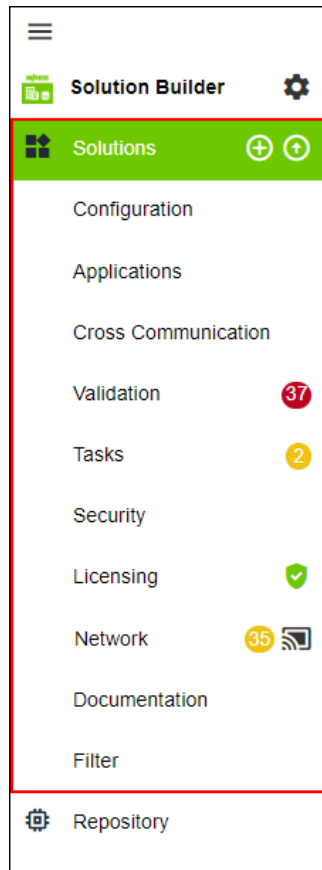


Figure 45: Side Menu > **Solutions** Menu

Note

Contents depend on addressing system

Some of the content and graphics outlined below depend on the addressing system and can be configured individually. The description of the tabs is provided as an example to guide you.

8.1.4.2.1 “Solutions” Menu Item

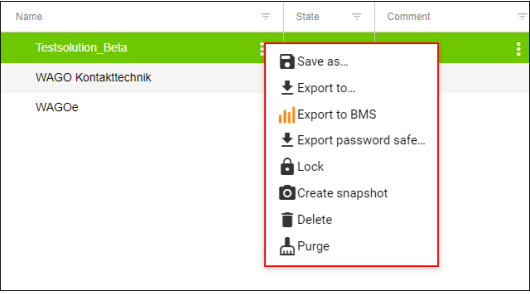
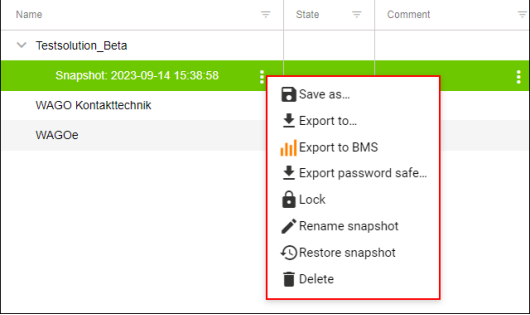
The “Solutions” menu item provides an overview of existing **solutions**. You can use this menu item to export and save solutions. It also offers a snapshot for a complete solution. The overview also shows the status, the selected addressing system and general data on the creation date, the owners and the last date of use for all solutions.


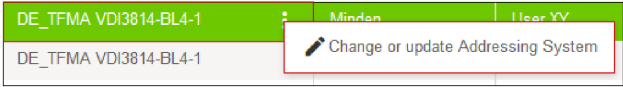
Name	State	Addressing system	Location	Owner	Created at	Last used
WAGO Kontakttechnik		DE_TFMA VDI3814-BL4-1	Minden	User XY	2021-07-29 14:14	2021-08-10 10:52
Customer2		Default		User XY	2021-07-21 14:27	2021-08-03 11:38
Customer1		DE_TFMA VDI3814-BL4-1	Berlin	User1	2021-07-15 14:25	2021-08-03 11:37

Figure 46: Side Menu > “Solutions” Menu Item

Name	State	Addressing system	Location	Owner	Created at	Last used
WAGO Kontakttechnik		DE_TFMA_VDI3814-BL4-1	Minden	User XY	2021-07-29 14:14	2021-08-20 10:33
Snapshot: 2021-08-20 09:05:01		DE_TFMA_VDI3814-BL4-1	Minden	User XY	2021-08-20 09:05	2021-08-19 16:48
Customer2		Default		User XY	2021-07-21 14:27	2021-08-03 11:38
Customer1		DE_TFMA_VDI3814-BL4-1	Berlin	User1	2021-07-15 14:25	2021-08-03 11:37

Figure 47: Side Menu > "Solutions" Menu Item > Action Area

Designation	Description
Name	<p>Shows the name of the solution.</p> <ul style="list-style-type: none"> The following actions can be executed via the drop-down menu: <ul style="list-style-type: none"> Save As ... Export to ... (see "Export Solution" Dialog > 56) Export to BMS Export password safe ... Lock/unlock Create snapshot Delete Clear  <ul style="list-style-type: none"> The following actions can be performed when a snapshot exists: <ul style="list-style-type: none"> Save As ... Export to ... (see "Export Solution" Dialog > 56) Export to BMS Export password safe ... Lock/unlock Rename snapshot Restore snapshot Delete 
Status	<p>Indicates the solution's connection status.</p> <p>In the "Online" state, this line shows the status; in the "Offline" state, it remains blank.</p>
Addressing System	Shows the addressing system used for the solution.

Designation	Description
	 <p>An addressing system can be selected or updated via the drop-down menu.</p>  <p>Note: Addressing systems can only be updated or modified as long as the basic structure and IDs of the corresponding entity levels do not change. New selection options for certain levels, such as the building system, can be added at a later time. A new solution must be created in order to use an addressing system with a modified structure for the solution.</p>
Local	Optional field: For entering the location where the solution is used
Owner	Optional field: For entering the solution owner
Created on	Timestamp indicating when the solution was created
Last used	Timestamp indicating when the user last used the solution

8.1.4.2.1.1 “Export Solution” Dialog

This function creates a compressed data packet of all of the selected solution’s data. The solution is given a unique ID, and various mechanisms (password, lock) can be used to protect it against unauthorized access and accidental editing.

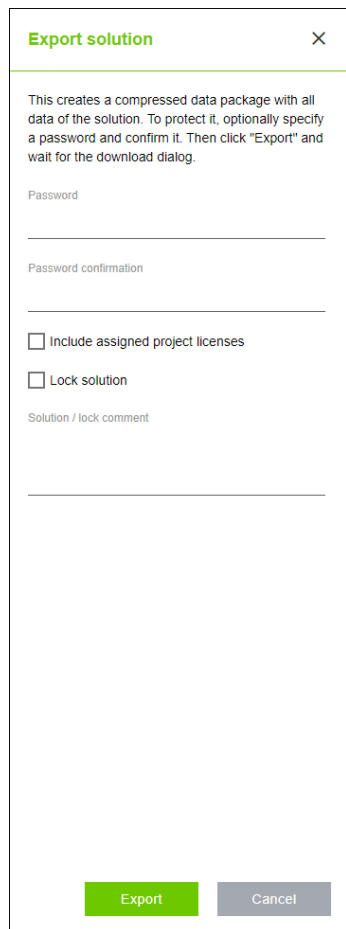


Figure 48: Side Menu > “Solutions” Menu Item > “Export Solution” Action

Designation	Description
Password	For entering and reentering the password for the solution to export.
Password confirmation	
Include assigned project licenses	Includes all assigned project licenses.
Lock solution	Write protection: locks the solution when it is exported so it cannot be accidentally edited.
Comments	Comments for the solution to export.
[Export]	Starts the export.
[Abort]	Cancels the operation.

You can find more information in:

[🔗 "Import Solution" Dialog \[> 37 \]](#)

8.1.4.2.2 "Configuration" Menu Item

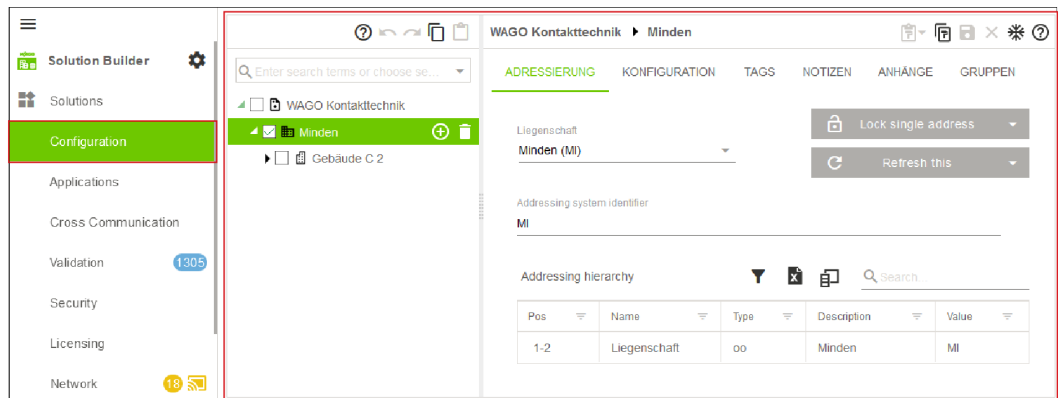


Figure 49: Side Menu > "Configuration" Menu Item

This menu item contains several tabs with configuration options for the solution. You can set up and configure your own solution offline in this area. The tabs that are displayed depends on the entity marked in the entity tree. The tabs can be individually configured via the addressing system.

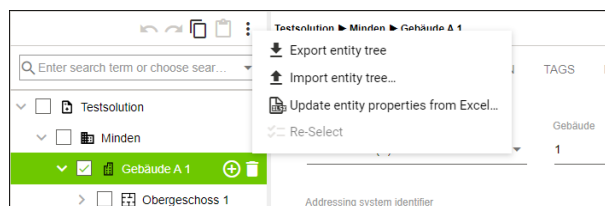


Figure 50: Side Menu > "Configuration" Menu Item > Export/Import Entity Tree

The displayed entity tree can also be exported or imported. This functionality is especially useful when individual WAGO Solution Builder components are installed across different work environments (see [🔗 Installing WAGO Solution Builder on Windows \[> 17 \]](#)) and you need to swap out components of the solution.

8.1.4.2.2.1 "ADDRESSING" Tab

If you want to use an [addressing system](#) in addition to naming entities with plain text (see "Solution Name" on the [🔗 "CONFIGURATION" Tab \[> 59 \]](#)), the "ADDRESSING" tab can optionally be filled in.

If BACnet objects are linked with entities of type "data point," the "Object_Name" property of the objects is replaced with the addressing system identifiers upon deployment to the device. This is the main use case for the addressing system in the WAGO Solution Builder software.

The addressing system has a hierarchical structure, assigning each entity a special identifier, which is determined by the entity's position in the tree and the entities parameterized above it.

Depending on the project requirements, addressing systems can be modified with XML files or newly created. The addressing systems provided are available in the form of templates in the WAGO Solution Builder software installation directory at the following path: `Config\BuildingStructures`. You can contact WAGO Technical Support if you need technical assistance or have other modification requests.

The contents of this tab depend on the entity and **addressing system** selected.

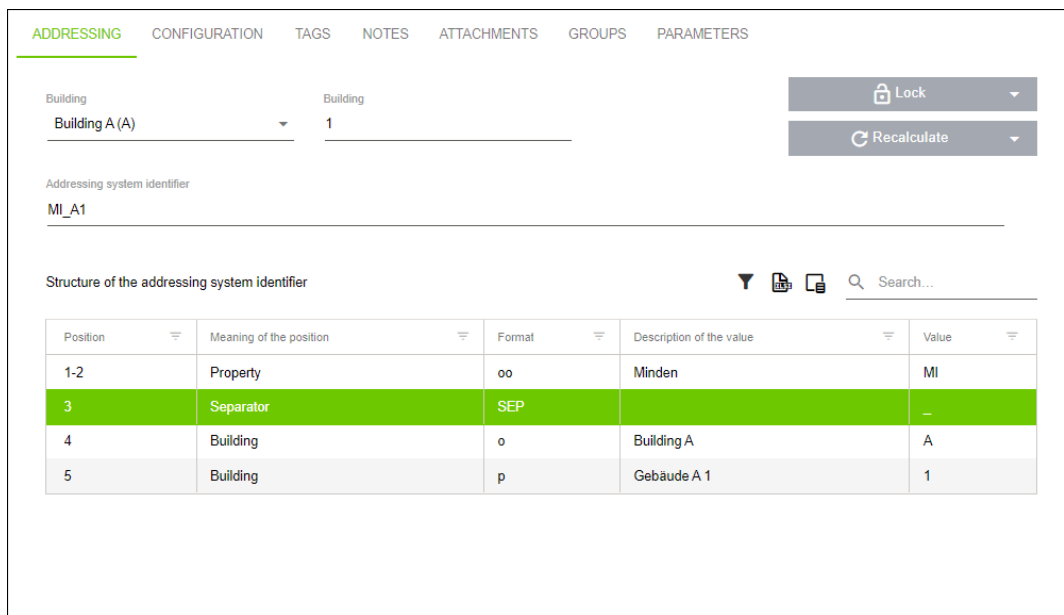


Figure 51: Side Menu > "Configuration" Menu Item > "ADDRESSING" Tab

Designation	Description	
[Lock]	Lock	Locks the current value for the "Addressing system identifier" field for this entity so it cannot be changed automatically.
	Lock all	Locks the current value for the "Addressing system identifier" field for this entity and all its child entities so they cannot be changed automatically.
[Recalculate]	Recalculate	Initiates manual recalculation of the addressing system for this entity.
	Recalculate all	Initiates manual recalculation of the addressing system for this entity and all its child entities.
Name of selected entity type (In the example figure shown here: Building)	Here the entity is addressed on the basis of the configuration in the addressing system. The drop-down menu offers a full-text search function for you to select pre-configured selection options, numbering or free text.	

Designation	Description
Addressing key (short form)	<p>Rule-based entity addressing key (short form)</p> <p>The addressing key consists of the entity's own identifier (see "Name of selected entity type" field) and of those of the higher-level entities. Manual input is normally not required here, since the field is generated automatically. If manual modifications are made, the field is disconnected from the automatic mechanism, and the "Manually defined value" icon appears (see General Operating Elements and Icons [> 42]).</p> <p>The representation is based on the existing tree structure and follows a defined rule set with a naming concept. The uppermost entity, without exception, forms the root element and is displayed in the first position. All other entities are then displayed in chronological order.</p>
Addressing key description (long form)	<p>Individual addressing key of the entity (long form)</p> <p>Display for an optionally assigned addressing key description (long form of the addressing key). The addressing key description is the advanced option for defining a custom representation of an addressing key and assigning additional properties to the corresponding entities.</p> <p>The representation is not based on the existing tree structure. All entities can be configured individually without a defined naming concept and without fixed position information. This rule set, which you define yourself, then yields a specific representation that is independent of fixed specifications.</p> <p>This field is only displayed if an addressing key description is defined. The field cannot be edited.</p> <p>For more information, see section "Addressing System Format" Area [> 122].</p>
Structure of the addressing key	Structure of the entity's addressing key, including description
No.	Number and position of the characters for the level in the addressing key
Name	Level name
Type	<p>Level type</p> <p>The type also determines what characters there are for a level and how many there are.</p> <p>Examples:</p> <ul style="list-style-type: none"> ▪ "SEP" for fixed separator ▪ "oo" for two characters from a pre-selection list ▪ "p" for a number with one character
Description	Description of the selected addressing key.
Value	Abbreviation for the individual levels

8.1.4.2.2.2 "CONFIGURATION" Tab

The "CONFIGURATION" tab contains general properties and information about the entity selected in the structure tree. All editable boxes are underlined with solid lines. Non-editable boxes are underlined with dotted lines. The non-editable boxes are calculated and filled in automatically.

This tab appears with varying contents, depending on the level type when each entity is selected.

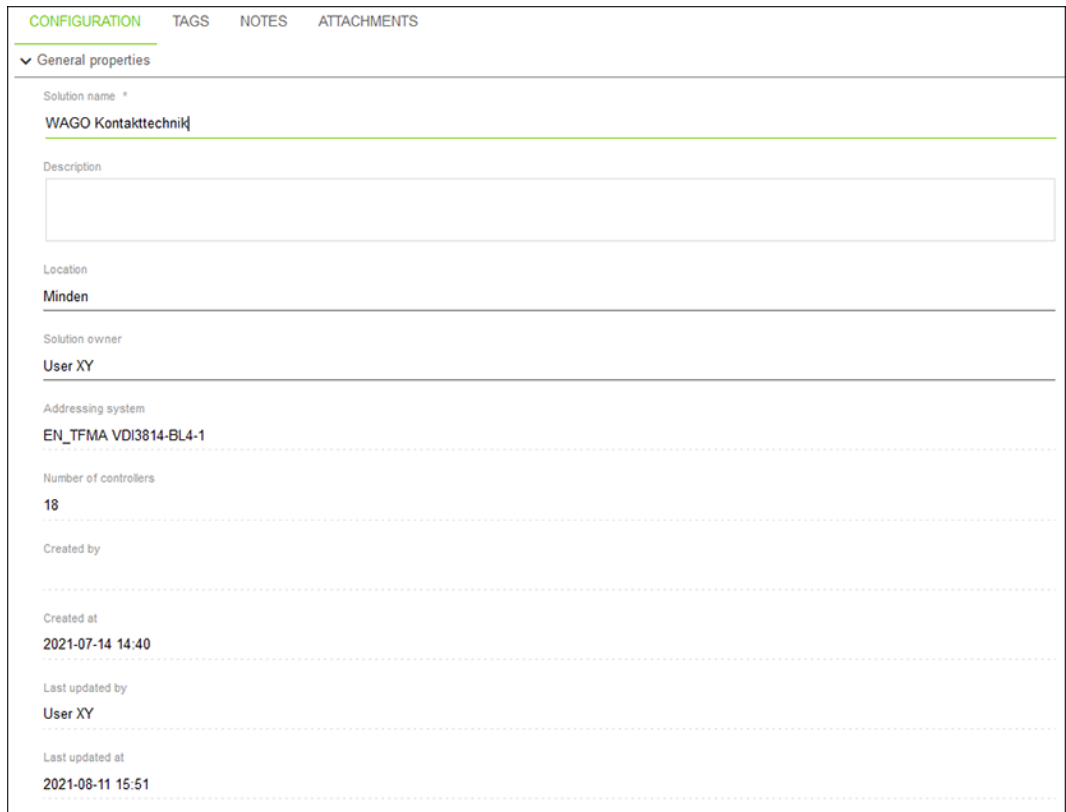


Figure 52: Side Menu > "Configuration" Menu Item > "CONFIGURATION" Tab

8.1.4.2.2.3 "TAGS" Tab

The "TAGS" tab provides a description of the entity using one or more TAGs. Any arbitrary TAG can be entered using free text and this is subsequently also offered in all other TAG boxes. Depending on the configuration in the addressing system, default TAGs are also available for selection to provide for uniform tagging across solutions.

This tab appears with varying contents, depending on the level type when each entity is selected.

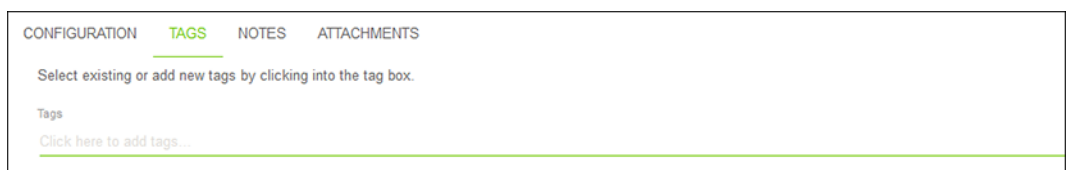
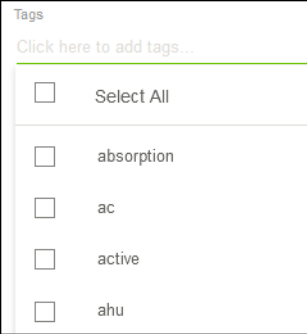


Figure 53: Side Menu > "Configuration" Menu Item > "TAGS" Tab

Table 13: Legend for Figure “Side Menu > “Configuration” Menu Item > “TAGS” Tab”

Designation	Description
Tags	<p>Option for selecting one or more TAGS</p> <p>The selection list can be edited in the addressing system. In the example given here, TAGS from “Project Haystack” (https://project-haystack.org/) can be selected.</p> 

8.1.4.2.2.4 “NOTES” Tab

The “NOTES” tab is used for creating individual notes for the selected entity. Every note is saved with the creation date and time.

This tab appears with varying contents, depending on the level type when each entity is selected.

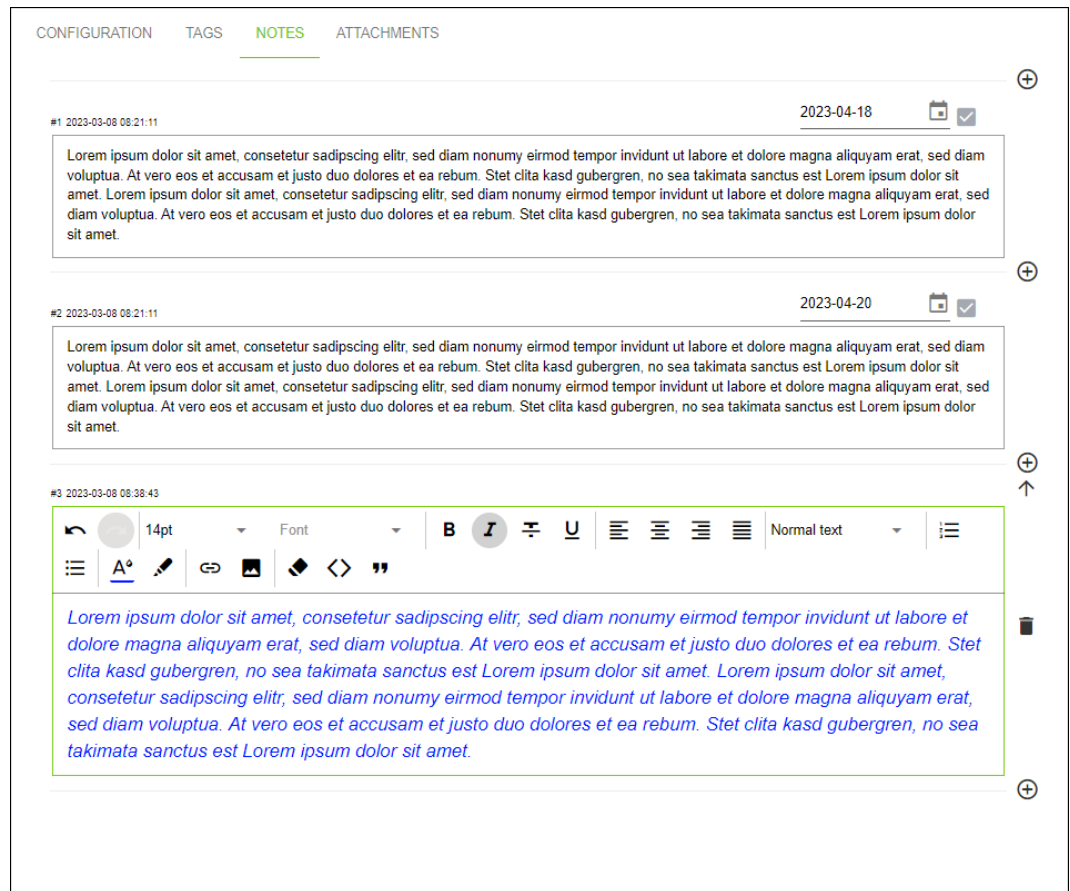






Figure 54: Side Menu > “Configuration” Menu Item > “NOTES” Tab

Table 14: Legend for Figure "Side Menu > 'Configuration' Menu Item > 'NOTES' Tab"

Designation	Description	Description
Add note		Adds a new note.
Delete note		Deletes a note.
Task list		Marks the selected note as a "Task" and adds them to "Tasks" Menu Item. Tasks can be given a due date and assigned to a defined user.
Project documentation		Adds the selected note to the project documentation.

8.1.4.2.2.5 "ATTACHMENTS" Tab

The "ATTACHMENTS" tab is used to add attachments to the solution.

You can move the files to be attached directly to the "ATTACHMENTS" tab by drag&drop, or in the classic way via a file selection dialog by clicking the **[Select file]** button.

This tab appears with varying contents, depending on the level type when each entity is selected.

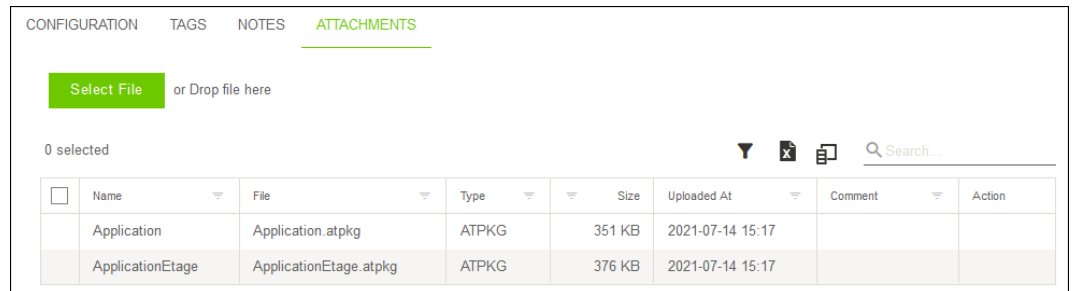


Figure 55: Side Menu > "Configuration" Menu Item > "ATTACHMENTS" Tab

8.1.4.2.2.6 "GROUPS" Tab

The "GROUPS" tab shows the group(s) that the selected entity belongs to.

If the selected entity is its own group, the members of this group appear here and can be edited. Members can be added to the group here (see [Adding an Entity to a Group](#) > 175).

For the "Group" entity, it is possible to automatically populate the member list using a saved filter.

This tab appears in the action area after selecting the entity "Property".

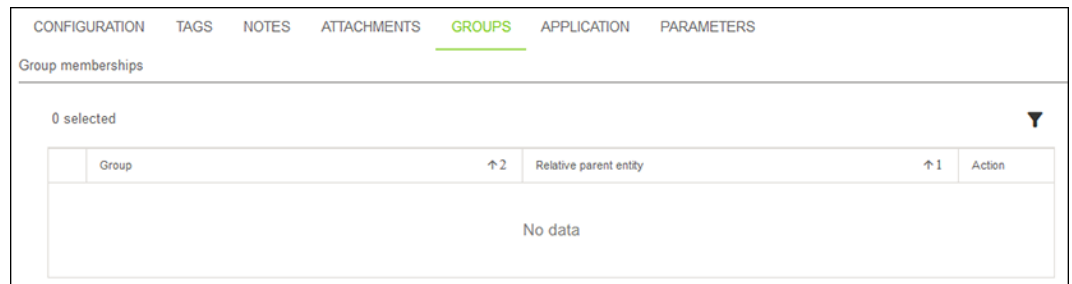


Figure 56: Side Menu > "Configuration" Menu Item > "GROUPS" Tab

Designation	Description
Group	Shows the group name.
Relatively higher-level entity	Shows the path to the group, if this is located in a different area of the entity tree.
Action	Revokes group membership using the Delete icon.

8.1.4.2.2.7 "APPLICATION" Tab

The "APPLICATION" tab shows information about the Application template.

This information is used to determine the target device and target firmware for which an application is intended. It also shows the Application template's version and name and a description of it (see [🔗 "Applications" Menu Item \[p. 78\]](#)).

This tab appears when the "Application instance" entity is selected.

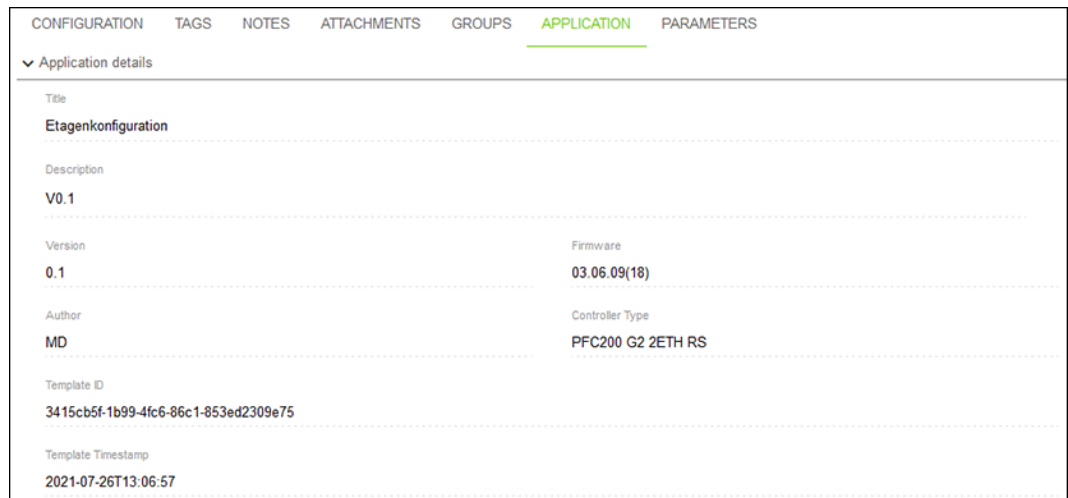


Figure 57: Side Menu > "Configuration" Menu Item > "APPLICATION" Tab

Designation	Description
Title	Shows the Application template's name.
Description	Optional field: Shows the description of the Application template.
Version	Optional field: Shows the Application template version.
Firmware	Shows the controller firmware required for the Application template.
Author	Optional field: Shows the author of the Application template.
Control system model	Shows the controller required for the Application template.
Template ID	Shows the unique ID of the Application template
Template Timestamp	Indicates the creation date (timestamp) of the Application template.

8.1.4.2.2.8 "PARAMETERS" Tab

The "PARAMETERS" tab is used for configuring the application instance.

Parameter configuration allows you to customize the individual instances, in contrast to the generally applicable application templates. For example, these parameters are the preferred way to configure the hardware IDs of the sub-bus devices actually used in the building, which are transferred to the controller later via synchronization.

This tab appears when the "Application instance" entity is selected.

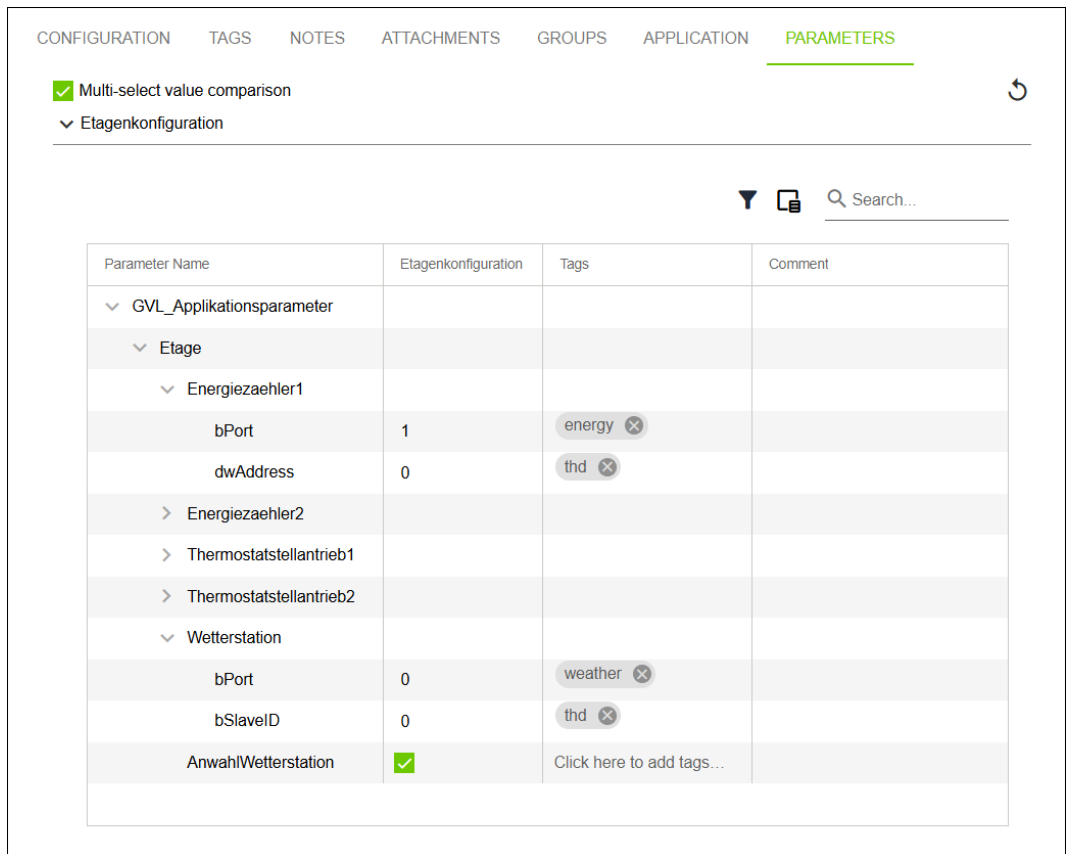


Figure 58: Side Menu > "Configuration" Menu Item > "PARAMETERS" Tab

Table 15: Legend for Figure "Side Menu > 'Configuration' Menu Item > 'PARAMETERS' Tab"

Designation	Description
Value Comparison for Multiple Selection	<input checked="" type="checkbox"/> Value comparison is enabled. The display may sometimes lag, depending on how many parameters there are and how many entities are selected. Note: Note the selection order! First check the box and then select the entities to compare. Otherwise, the values may be displayed incorrectly!
	<input type="checkbox"/> Value comparison is disabled. The display is faster, regardless of how many parameters there are and how many entities are selected. The display itself only shows the values of the first entity.
Parameter Name	Shows the name of the parameter.
Variable name	Shows the original name of the associated variable in the IEC Development Environment.
Name of this parameter set (In the sample figure shown here: Level configuration)	Shows the name of the parameter set.
Tags	Shows the tagging for parameters.
Comments	Displays comments about the specific parameter.

8.1.4.2.2.9 "CONNECTION" Tab

The "CONNECTION" tab provides configuration options for the connection to the device.

There are two different parameter types: The IP address and the access data are not used to configure the device itself, but rather allow the WAGO Solution Builder software to establish the connection to a device with these parameters. The IP address entered here is also applied automatically when the controller is switched from DHCP to static IP via the controller settings in the "CONTROLLER" tab (see ["CONTROLLER" Tab \[p. 66\]](#)).

You can enter the MAC address entered manually to use it on the DHCP server for mapping target IPs to the MAC addresses (see ["DHCP" Tab \[p. 107\]](#)). The MAC address is assigned automatically when controllers are added to the entity tree using "Scan" (["SCAN / IMPORT" Tab \[p. 102\]](#)). Access data must then only be entered manually if it differs from the factory settings.

The settings for BACnet are entered here as the target configuration for the device. The BACnet-BBMD functionality can also be enabled and configured for the device.

Note

Changes to parameters are transmitted directly to the WAGO Device Communication Service

Any changes made to parameters in the "CONNECTION" tab are communicated directly and at once to the WAGO Device Communication Service. You do not have to change between the „offline/online“ status in the connection area to refresh the changes!

This tab appears only when the "Controller" entity is selected.

Figure 59: Side Menu > "Solutions" Menu Item > "Configuration" Menu Item > "CONNECTION" Tab – Introduction

Designation	Description
TCP/IP	

Designation	Description	
IP address	For entering the IP address for connecting to the device.	
MAC address	For entering the device MAC address.	
BACnet		
Device ID/Instance number	Optional field: To be entered only when the device BACnet function is used: the BACnet device ID as the target configuration for the device. This must be unique in the network and fall within the range from 0 and 4194302.	
Access data		
Root access	Optional field: For entering a username and password for root access. Only to be entered if the device uses a password that differs from the WAGO factory settings.	
CODESYS access	Optional field: For entering a username and password for CODESYS access. Only to be entered if the device uses a password that differs from the WAGO factory settings.	
BBMD		
Act as BACnet/IP broadcast management device	<input type="checkbox"/>	The device should not act as a BACnet/IP broadcast management device .
	<input checked="" type="checkbox"/>	The device should act as a BACnet/IP broadcast management device.
Allow third-party device	<input type="checkbox"/>	Can only be used when BBMD function is enabled: Registration of BACnet foreign devices (BACnet third-party devices) is not permitted at this BBMD .
	<input checked="" type="checkbox"/>	Can only be used when BBMD function is enabled: Registration of BACnet foreign devices (BACnet third-party devices) is permitted at this BBMD .
Initial broadcast distribution table	Can only be used when BBMD function is enabled: Configuration of the following parameters in the table for all BBMDs in the network, including the device itself: <ul style="list-style-type: none"> • IP address • BACnet port • Mask (default: 255.255.255.255) 	

8.1.4.2.2.10 "CONTROLLER" Tab

The "CONTROLLER" tab contrast the details of the physical controller with those of the controller required by the application. At the same time, selected controller settings from Web-Based Management can also be configured for one or more devices directly on the Software user interface.

This tab appears only when the "Controller" entity is selected.

Details

CONFIGURATION TAGS NOTES ATTACHMENTS CONNECTION GROUPS CONTROLLER DATA POINTS SUB BUSES		
Details		
	Physical controller details	Application controller details (expected)
Name	PFC200V3-4A5C6E	A1_Etagencontroller
Description	WAGO 750-8212 PFC200 G2 2ETH RS	PFC200 G2 2ETH RS
Order number	0750-8212	0750-8212
Firmware	03.06.19(18)	03.06.09(18)
Serial number	SN20201125T161131-1358989#PFCJ0030DE4A5C6E	
Latest backup		
Online state		
LED state		
PLC switch		
Module 0		
Module 0		
Module 0		
Module 1	0750-0643 MP-Bus Master	
Module 2	0753-0649 M-Bus-Master	
Controller settings		

Figure 60: Side Menu > "Configuration" Menu Item > "CONTROLLER" Tab > Details

Table 16: Legend for Figure "Side Menu > 'Configuration' Menu Item > 'CONTROLLER' Tab > Details"

Designation	Description
Physical controller details	Shows the properties of the physically connected device. Requirement: Requires an active monitoring job in "Online" mode and successful connection to the device.
Application controller details	Shows the properties of the controller required by the application.

Device Details

Here you can configure third-party controllers without an assigned **application template**. The configuration can be specified via the stored device settings model. Once the controller is configured, the "WBM – Web-Based Management" item is enabled and appears in the "Controller Settings." Here you can make the device settings.

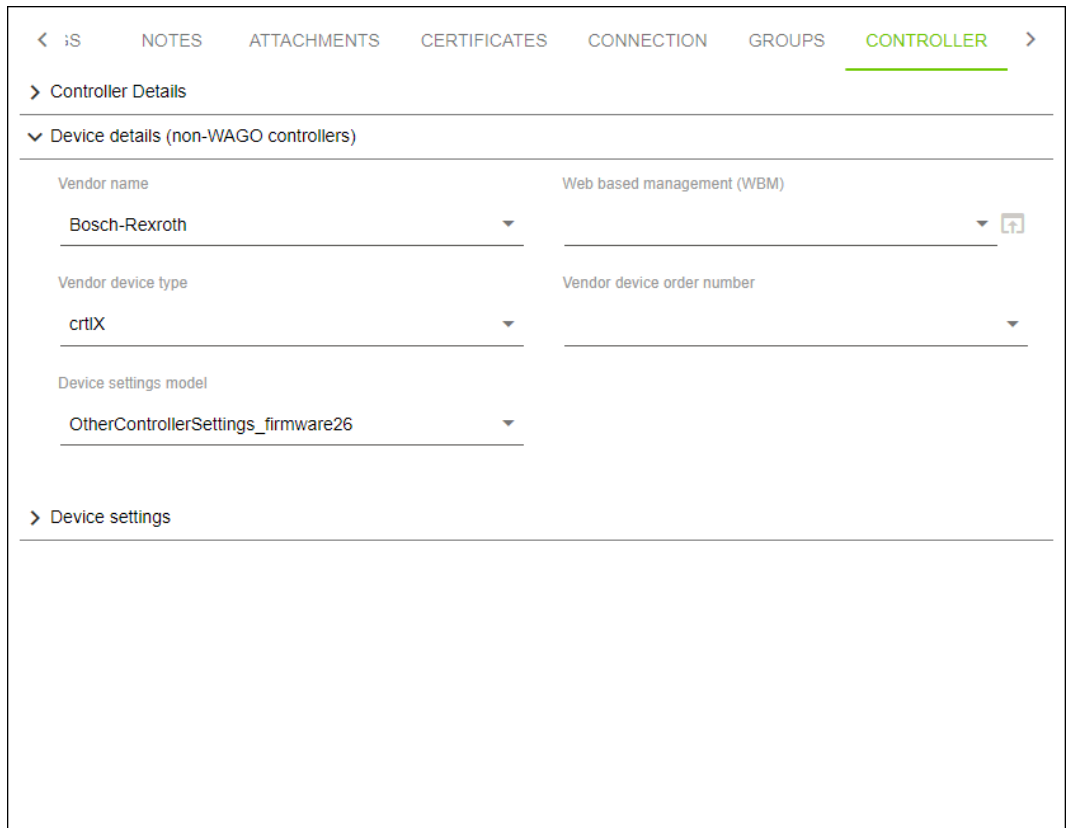


Figure 61: Side Menu > "Configuration" Menu Item > "CONTROLLER" Tab > Device Details

Table 17: Legend for Figure "Side Menu > 'Configuration' Menu Item > 'CONTROLLER' Tab > Device Details"

Designation	Description
Manufacturer Name	Entry for manufacturer name
Manufacturer Device Type	Entry for product name
Device Setting Model	Entry for device details/firmware
Web-Based Management (WBM)	Entry for WBM address You can enter the address in the following formats: <ul style="list-style-type: none"> ▪ No entry: Opens the address without <i>http</i> or <i>https</i> ▪ URL (short form): Example: <i>/wbm/index.html</i> Opens the address in short form. ▪ URL (long form): Example: <i>http://{0}:8001/other.html</i> Opens the address in long form. ▪ URL (fixed): Example: <i>http://localhost:8001/controller3.html</i> Opens a fixed address.
Manufacturer's Device Order Number	Entry for the item number Note: The item number entered must match the item number of the connected device in order for the settings to be synchronized.

Controller Settings

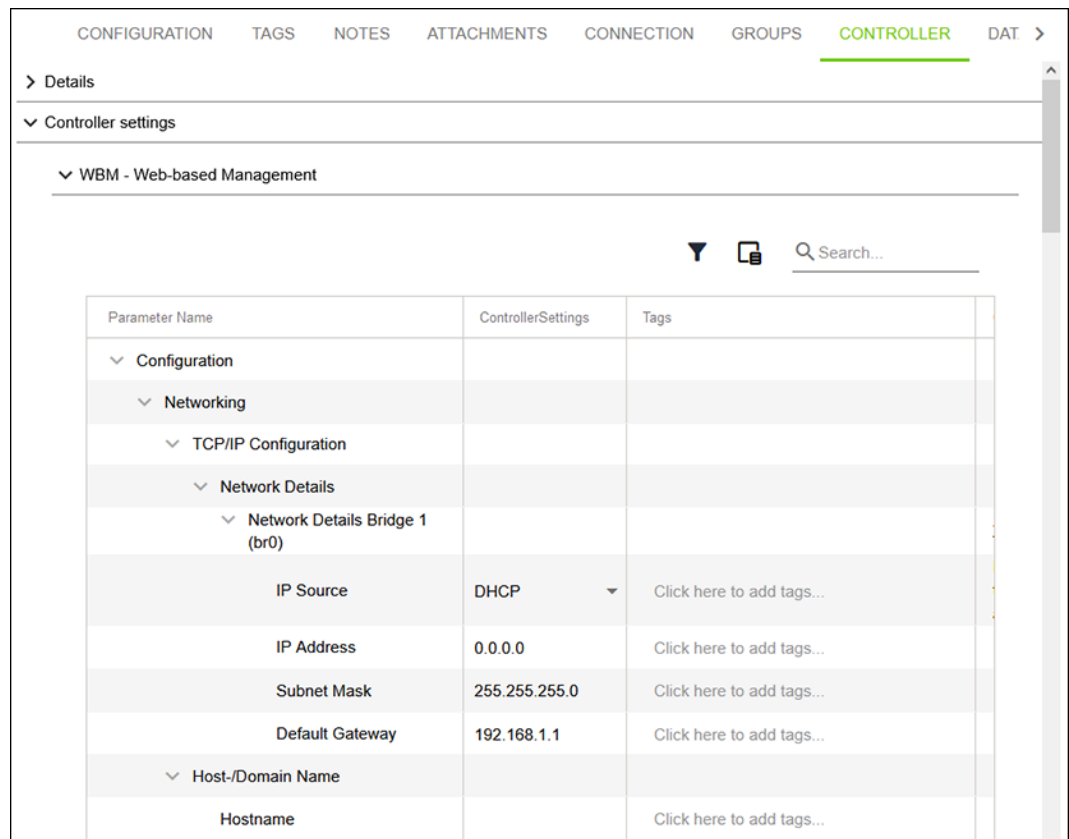


Figure 62: Side Menu > "Configuration" Menu Item > "CONTROLLER" Tab > Controller Settings

Table 18: Legend for Figure "Side Menu > 'Solutions' Menu Item > 'Configuration' Menu Item > 'CONTROLLER' Tab > Controller Settings"

Designation	Description
Parameter Name	Shows the name of the parameter (see "WBM" Tab [p. 74]).
Controller settings	Shows the target value of the parameter. Note: The WAGO Solution Builder software only transfers modified parameters to the device! The default values show the firmware's default settings. Since the WAGO Solution Builder software does not read these parameters, these values may not match the actual values on the device!
Tags	Shows the tags of parameters.

8.1.4.2.2.11 "LICENSES" Tab

The "LICENSES" tab lists all licenses of the selected controller and their status. New licenses can also be assigned manually.

This tab appears only when the "Controller" entity is selected.

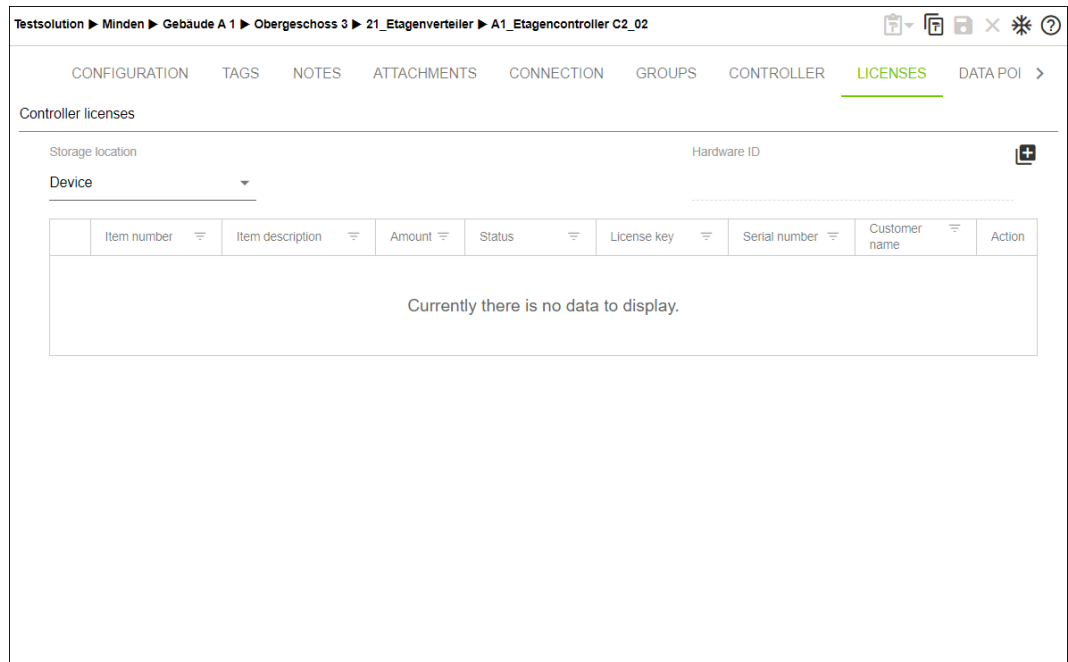

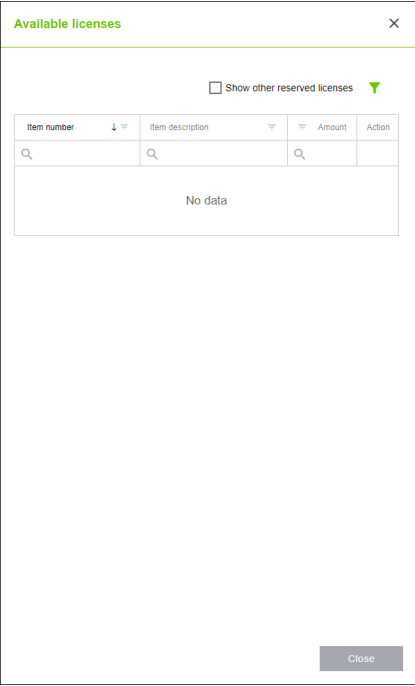


Figure 63: Side Menu > "Configuration" Menu Item > "LICENSES" Tab (sample figure)

Table 19: Legend for Figure "Side Menu > 'Configuration' Menu Item > 'LICENSES' Tab (sample figure)"

Designation	Description
Storage location	Selection of the storage location.
Hardware ID	ID of the selected controller.
	<p>Manually assigns a license to the selected controller. All available licenses are listed for this. The license can be added to the selected controller.</p> 
Item Number	Item number of the license
Item Description	Item description of the license
Quantity	Number of licenses
Status	Status of the licenses
License key	License key (in short form)

Designation	Description
Serial number	Serial number of the license
Customer name	Customer name for which the license was issued
Action	Deletes the license

8.1.4.2.2.12 "DATA POINTS" Tab

The "DATA POINTS" tab lists all the physical I/O and BACnet objects for a controller, including any links of theirs to the entity tree.

This tab appears only when the "Controller" entity is selected.

Properties of BACnet objects

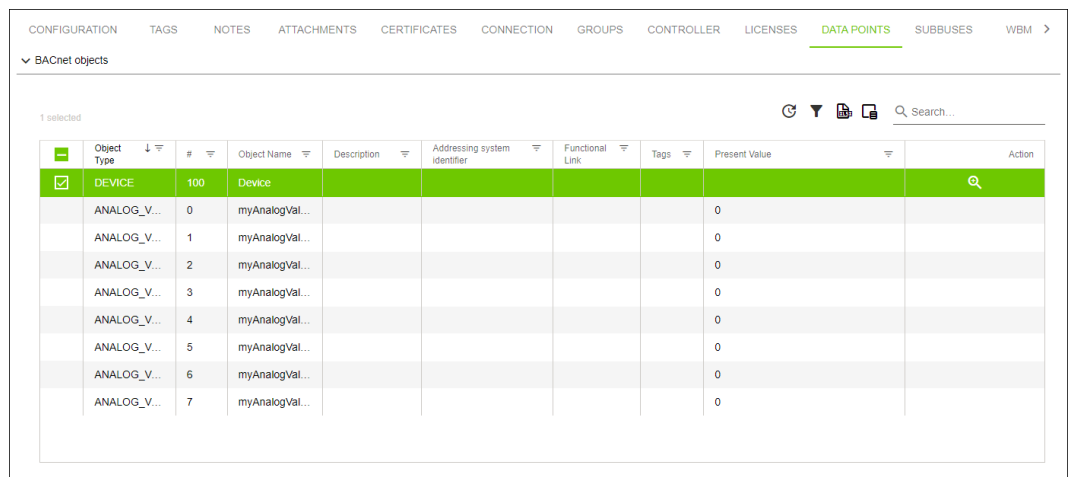










Figure 64: Side Menu > "Configuration" Menu Item > "DATA POINTS" Tab (Example Figure)

Table 20: Legend for Figure "Side Menu > Solutions Menu > 'Configuration' Menu Item > 'DATA POINTS' Tab (Example Illustration)" – BACnet Objects

Designation	Description
	<p>Starts cyclic querying of all BACnet objects and opens the "BACnet Settings" dialog. In this dialog, you can configure the BACnet settings in such a way that the current values for "Present Value" are read out live from the BACnet stack and shown in the Present Value column (see below) in the WAGO Solution Builder software.</p> <div data-bbox="703 1429 1311 1989" style="border: 1px solid black; padding: 5px;"> <p>BACnet settings ×</p> <p>BACnet Network Interface Select... ▼</p> <hr/> <p>BACnet Port 47808</p> <hr/> <p><input type="checkbox"/> Register as foreign device</p> <p>IP address</p> <p>Port 47808</p> <p>Reregistration Interval 300 s</p> <div style="text-align: right; margin-top: 10px;"> OK Cancel </div> </div>

Designation	Description				
	Stops cyclic querying of the BACnet objects; only visible if a query was started previously.				
Object Type	"Object Type" per BACnet standard				
#	"Object Instance" per BACnet standard				
Name	"Object Name" per BACnet standard If the BACnet object is linked to a data point of the entity tree, the object name is automatically replaced with the addressing key when the BACnet configuration is synchronized with the device.				
Description	Description per BACnet standard				
Addressing System Code	When an object is linked to a data point in the entity tree, the calculated addressing system code appears in this column.				
Functional Data Point	Linked data point from the entity tree				
Tags	Tag provided for this BACnet object in the Application template.				
Present Value	The values for "Present Value" appear in this column live from the BACnet stack. For values to be read out, the BACnet settings must be configured accordingly (see the "BACnet Settings" dialog).				
Action	In this column, the following actions can be performed: <table border="1" data-bbox="699 846 1450 1030"> <tbody> <tr> <td></td> <td>Adds the "Present Value" of the selected BACnet object to a BACnet watchlist (see "BACnet WATCHLIST" Tab [p. 109])</td> </tr> <tr> <td></td> <td>Opens the "Properties" dialog. In this dialog, additional properties of the selected BACnet object can be selected for monitoring (in addition to the "Present Value"). The assigned properties are then shown in detail in the BACnet watchlist.</td> </tr> </tbody> </table>		Adds the "Present Value" of the selected BACnet object to a BACnet watchlist (see "BACnet WATCHLIST" Tab [p. 109])		Opens the "Properties" dialog. In this dialog, additional properties of the selected BACnet object can be selected for monitoring (in addition to the "Present Value"). The assigned properties are then shown in detail in the BACnet watchlist.
	Adds the "Present Value" of the selected BACnet object to a BACnet watchlist (see "BACnet WATCHLIST" Tab [p. 109])				
	Opens the "Properties" dialog. In this dialog, additional properties of the selected BACnet object can be selected for monitoring (in addition to the "Present Value"). The assigned properties are then shown in detail in the BACnet watchlist.				

Properties of Digital and Analog Inputs and Outputs of a Controller

Table 21: Legend for Figure "Side Menu > "Configuration" Menu Item > "DATA POINTS" Tab (Example Figure) – Analog/Digital I/O"

Designation	Description
Module	Module position in the node structure to which the input/output belongs.
Type	Type of input/output
Index (in Module)	Index of the input/output in the module
Name	Module name
Addressing System Code	When an object is linked to a data point in the entity tree, the calculated addressing system code appears in this column.
Functional Data Point	Linked data point from the entity tree
Tags	The tags provided for this input/output in the Application template

8.1.4.2.2.13 "SUB-BUSES" Tab

The "SUB-BUSES" tab lists all the sub-bus devices for this controller that are configured in the Application template, including the information relevant for the specific type, such as the address, line in the node structure, etc.

This tab appears only when the "Controller" entity is selected.

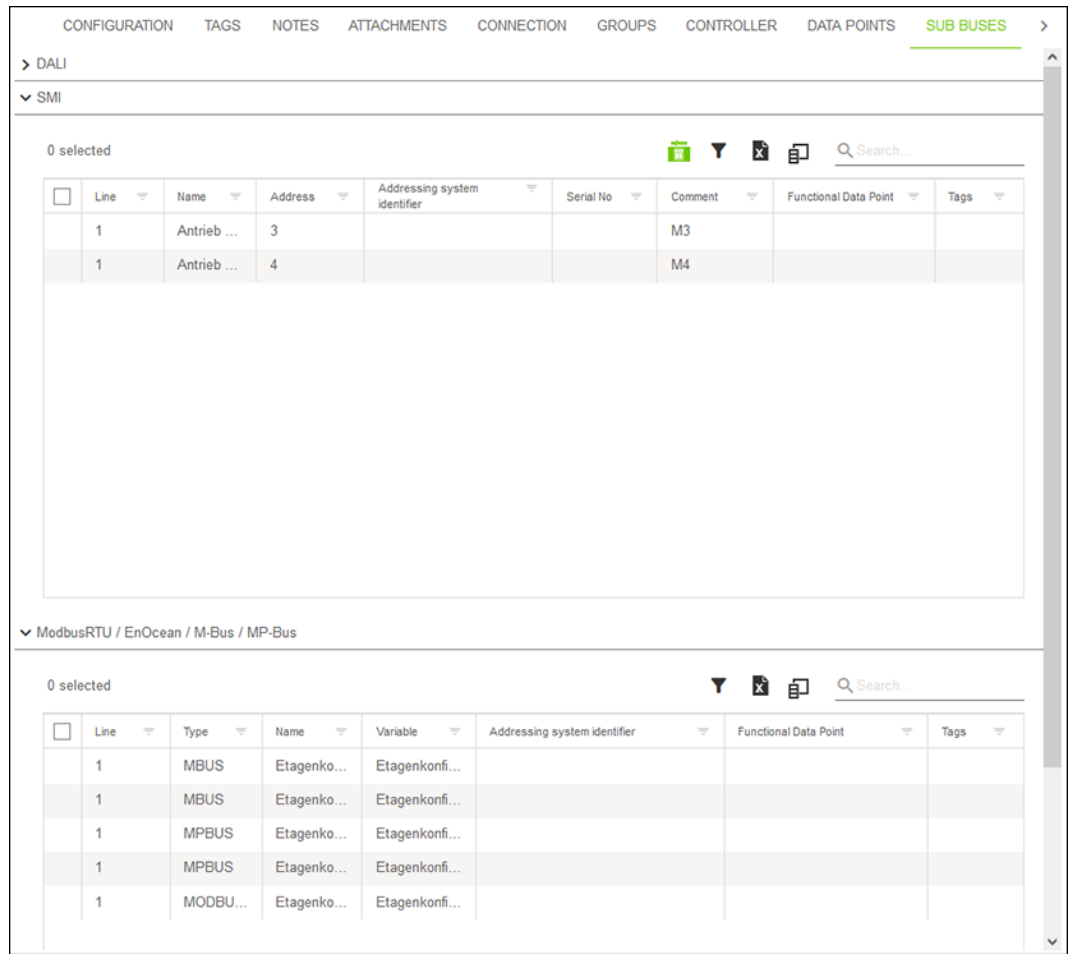


Figure 65: Side Menu > "Solutions" Menu > "Configuration" Menu Item > "SUB-BUSES" Tab (Example Illustration)

Direct Links to Configurators

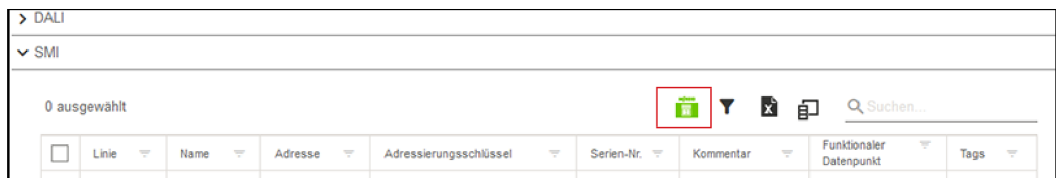




Figure 66: "SUB-BUSES" Tab > Buttons for Configurators

Projects can be opened from the "SUB-BUSES" tab and synchronized directly in the WAGO SMI Configurator and WAGO DALI Configurator configurators.

For the DALI or SMI project that has been opened, you can open it directly in the WAGO SMI Configurator or WAGO DALI Configurator software via the corresponding configurator icon. The configurators open in "WAGO Solution Builder mode"; therefore, all changes – such as specific customizations for a controller instance with an additional DALI ECG – are synchronized when you close the configurator and return to the WAGO Solution Builder software. The controller's DALI or SMI configuration is then unlinked from the Application template, since it has been customized.

Table 22: Direct Links to Configurators

Icon	Description
	Opens the project in the WAGO SMI Configurator software in "WAGO Solution Builder mode."
	Opens the project in the WAGO DALI Configurator software in "WAGO Solution Builder mode."

8.1.4.2.2.14 "WBM" Tab

Web-based management for the controller can be opened in the "WBM" tab.

Clicking the **[Open externally]** button opens a new Web browser tab containing the Web-based management for the controller, where provided.

This tab appears only when the "Controller" entity is selected.

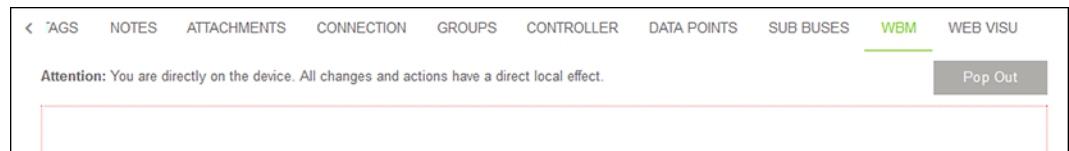


Figure 67: Side Menu > "Configuration" Menu Item > "WBM" Tab

8.1.4.2.2.15 "WEB VISU" Tab

Controller web visualization can be opened in the "WEB VISU" tab.

Clicking the button **[Open externally]** opens a new web browser tab containing the web visualization for the controller, where provided.

This tab appears only when the "Controller" entity is selected.

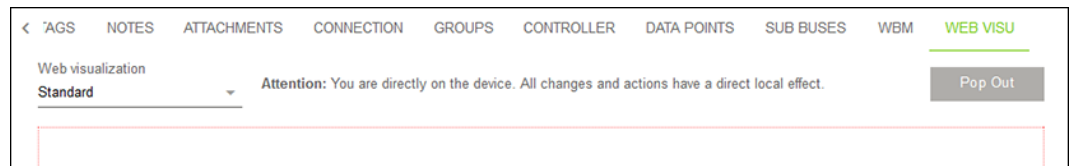


Figure 68: Side Menu > "Configuration" Menu Item > "WEB VISU" Tab

8.1.4.2.2.16 "PACKAGES" Tab

The "PACKAGES" tab shows the **IPK Packages** are to be installed on the selected controller. The packages can be added using an Application template or created manually in this tab. The text color here indicates whether the individual package was added automatically or created manually:

Table 23: IPK Packages: Text Color

Text color	Source
Black	The IPK package was created manually in this tab.
Light gray	The IPK package was added using an Application template.

This tab appears only when the "Controller" entity is selected.

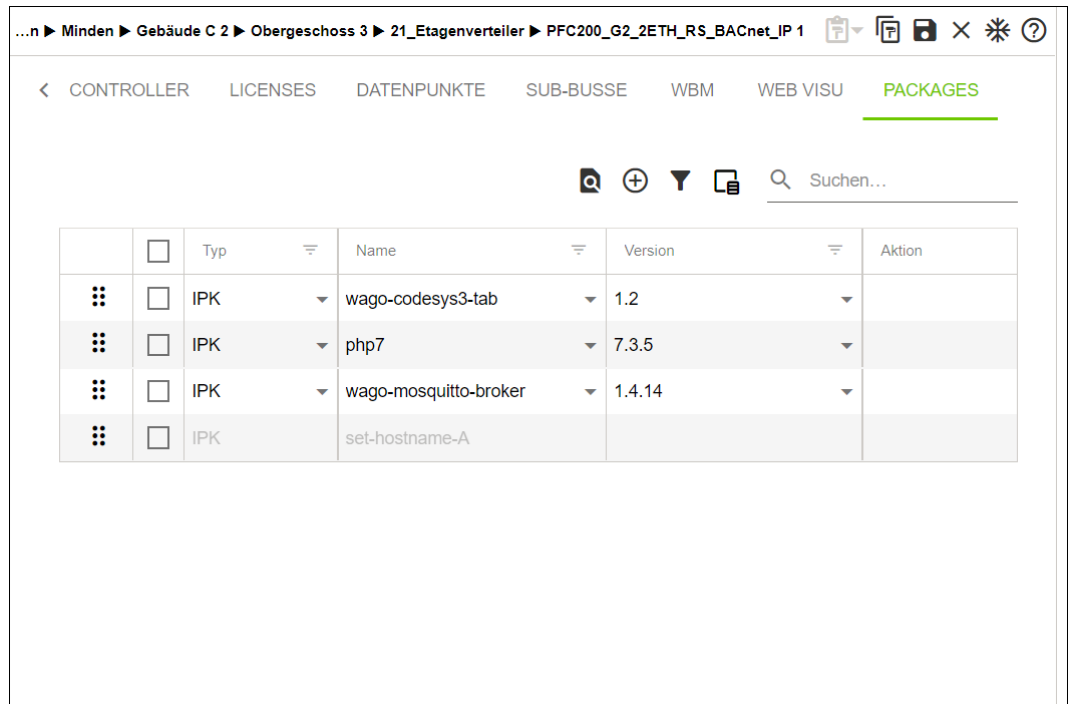


Figure 69: Side Menu > "Configuration" Menu Item > "PACKAGES" Tab

8.1.4.2.2.17 "CERTIFICATES" Tab

The "CERTIFICATES" tab contains various configuration options for managing certificates. New certificates can be created and generated, and existing certificates can be imported or exported for signing. All existing certificates are listed in a table.

The WAGO Solution Builder software generates private keys for certificates through elliptic curve encryption (ECC) with at least 256 bits.

This tab appears when the "Solution," "Property," and "Building" entities are selected and for all device types.

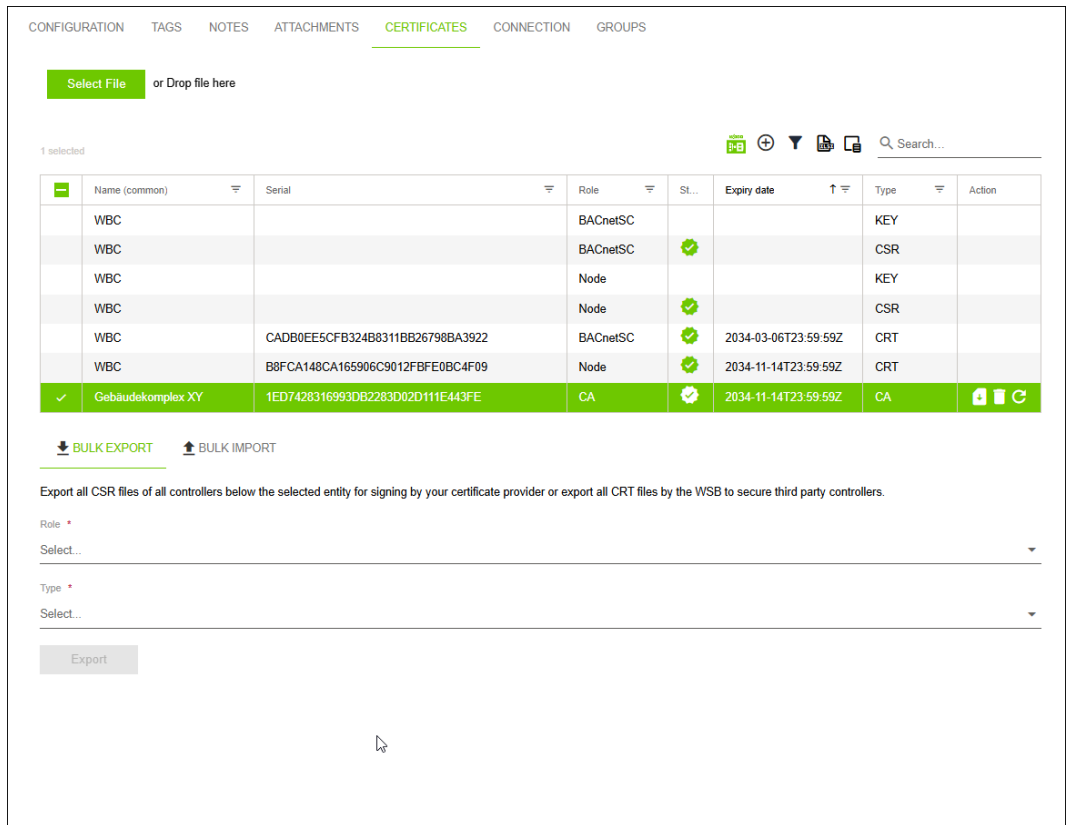




Figure 70: Side Menu > "Configuration" Menu Item > "CERTIFICATES" Tab

Designation	Description																								
[Select file]	Uploads a file.																								
	<p>Opens the WAGO BACnet-Konfigurator software and creates a new profile there for direct use of the BACnet/SC software. The name of the selected solution is used as the profile name. The following parameters are preset:</p> <ul style="list-style-type: none"> CA Certificate Certificate Private Key <p>Data exchange is completely automated, i.e., no relevant data needs to be exported or imported manually.</p>																								
	<p>Opens the "Generate New Certificate" dialog. In this dialog, you can configure the properties for the new certificate.</p> <div style="border: 1px solid #ccc; padding: 5px;"> <p>Generate new certificate ✕</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Role *</td> <td style="width: 50%;">Private key password</td> </tr> <tr> <td>Certification Authority</td> <td><input type="text"/></td> </tr> <tr> <td>Country (C)</td> <td>Common name (CN) *</td> </tr> <tr> <td>De</td> <td>Gebäudekomplex XY</td> </tr> <tr> <td>State or province (ST)</td> <td>Locality (L)</td> </tr> <tr> <td></td> <td>Hannover</td> </tr> <tr> <td>Organization (O)</td> <td>Validity time</td> </tr> <tr> <td>WAGO</td> <td>10 year(s)</td> </tr> <tr> <td>Organizational unit (OU)</td> <td>Valid from *</td> </tr> <tr> <td></td> <td>2024-03-11 </td> </tr> <tr> <td>Email address</td> <td>Valid to *</td> </tr> <tr> <td></td> <td>2034-03-11 </td> </tr> </table> <p style="text-align: right;"> <input type="button" value="Generate"/> <input type="button" value="Close"/> </p> </div>	Role *	Private key password	Certification Authority	<input type="text"/>	Country (C)	Common name (CN) *	De	Gebäudekomplex XY	State or province (ST)	Locality (L)		Hannover	Organization (O)	Validity time	WAGO	10 year(s)	Organizational unit (OU)	Valid from *		2024-03-11	Email address	Valid to *		2034-03-11
Role *	Private key password																								
Certification Authority	<input type="text"/>																								
Country (C)	Common name (CN) *																								
De	Gebäudekomplex XY																								
State or province (ST)	Locality (L)																								
	Hannover																								
Organization (O)	Validity time																								
WAGO	10 year(s)																								
Organizational unit (OU)	Valid from *																								
	2024-03-11																								
Email address	Valid to *																								
	2034-03-11																								

Designation	Description						
	<p>Opens the “Renew Certification Authority and Subcertificates” dialog. In this dialog, you can configure corresponding properties for existing certificates in order to have these certificates signed by the WAGO Solution Builder software.</p> <div data-bbox="699 327 1310 763" style="border: 1px solid #ccc; padding: 5px;"> <p>Renew Certification Authority and child certificates ×</p> <p><input checked="" type="checkbox"/> Certification Authority (CA) <input checked="" type="checkbox"/> Create KEY and CSR if needed</p> <p>Child certificates expiring within: Role of the new or renewed certificates *</p> <p>All BACnet/SC certificate ▼</p> <hr/> <p>Validity of Certificate Authority * Validity of Certificates *</p> <p>10 year(s) 2 year(s) ▼</p> <p>Private key password</p> <p>.....</p> <p style="text-align: right; color: orange; font-size: small;">This operation can not be undone!</p> <p style="text-align: right;"> Renew Close </p> </div>						
	<p>Distributes a certificate to selected controllers. This requires the controllers to be assigned a tag, which you can define yourself. The tag itself must start with “Certificate:”; after that, it can be defined freely.</p> <p>For more detailed information, see the following sections:</p> <ul style="list-style-type: none"> 🔗 Generating Server Certificates and Synchronizing with Connected Controllers [> 182] 🔗 “TAGS” Tab [> 60] 						
[Bulk Export]	<p>Exports the CSR files of all existing controllers below the selected entity in full. The CSR files can then be signed by an external certificate provider.</p> <p>Exports all CRT files to secure all existing third-party controllers.</p> <p>The CSR/CRT files are exported in a .zip file.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">Role</td> <td>Here you can select the role of the certificates to export.</td> </tr> <tr> <td>Type</td> <td>Here you can select the type of the certificates to export.</td> </tr> <tr> <td>[Export]</td> <td>Exports all certificates with the selected properties.</td> </tr> </table>	Role	Here you can select the role of the certificates to export.	Type	Here you can select the type of the certificates to export.	[Export]	Exports all certificates with the selected properties.
Role	Here you can select the role of the certificates to export.						
Type	Here you can select the type of the certificates to export.						
[Export]	Exports all certificates with the selected properties.						
[Bulk Import]	<p>Imports all CSR files from third-party controllers to have them signed by the WAGO Solution Builder software.</p> <p>Imports all CRT files signed by an external certificate provider. The CRT files are assigned to the controllers with the corresponding connection address below the selected entity. Existing certificates are overwritten.</p> <p>The CSR/CRT files are imported in a .zip file.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">Role</td> <td>Here you can select the role of the certificates to import.</td> </tr> <tr> <td>[Import]</td> <td>Imports all certificates with the selected properties.</td> </tr> </table>	Role	Here you can select the role of the certificates to import.	[Import]	Imports all certificates with the selected properties.		
Role	Here you can select the role of the certificates to import.						
[Import]	Imports all certificates with the selected properties.						

8.1.4.2.2.18 “ACCESS CONTROL” Tab

The “ACCESS CONTROL” tab can be used to assign specific **access rights** for entities. These access rights allow you to deliberately restrict the permissions of users that have been created and totally block specific actions in the software. For more information, see section [🔗 Assigning Access Control to Entities \[> 192 \]](#).

This tab only appears in the “Owner” user role below the root element up to the “Controller” entity.

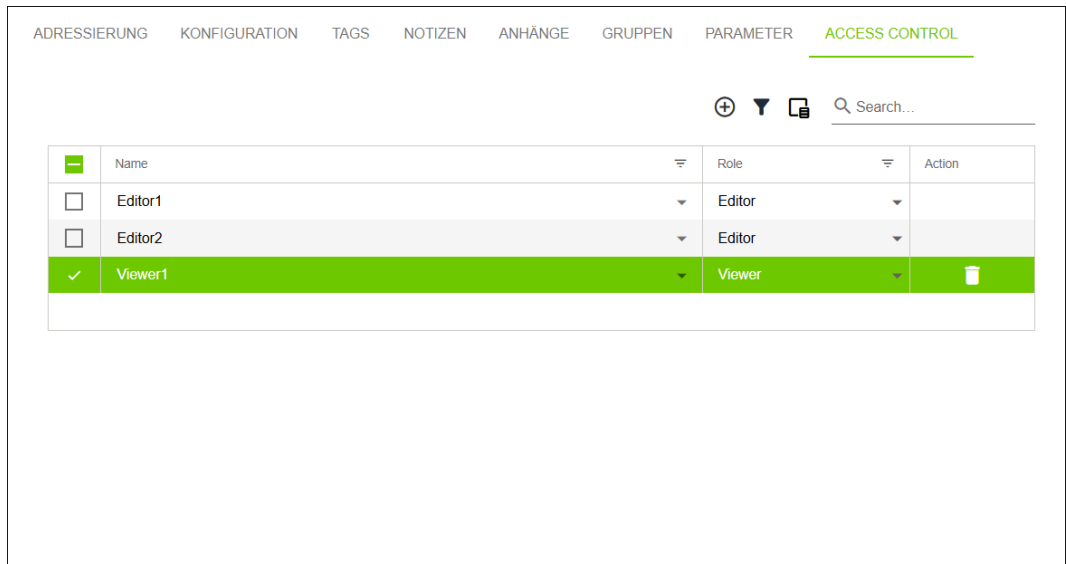


Figure 71: Side Menu > "Configuration" Menu Item > "ACCESS CONTROL" Tab

Designation	Description
Name	For selecting a user that was created in the "Access Control" Dialog [p. 87] directory.
Role	For selecting an associated role.
Action	Revokes group membership using the Delete icon.

8.1.4.2.3 "Applications" Menu Item

The "Applications" menu item manages all of a solution's Application templates.

New Application templates in *.atpkg format can be uploaded using the "Import" function.

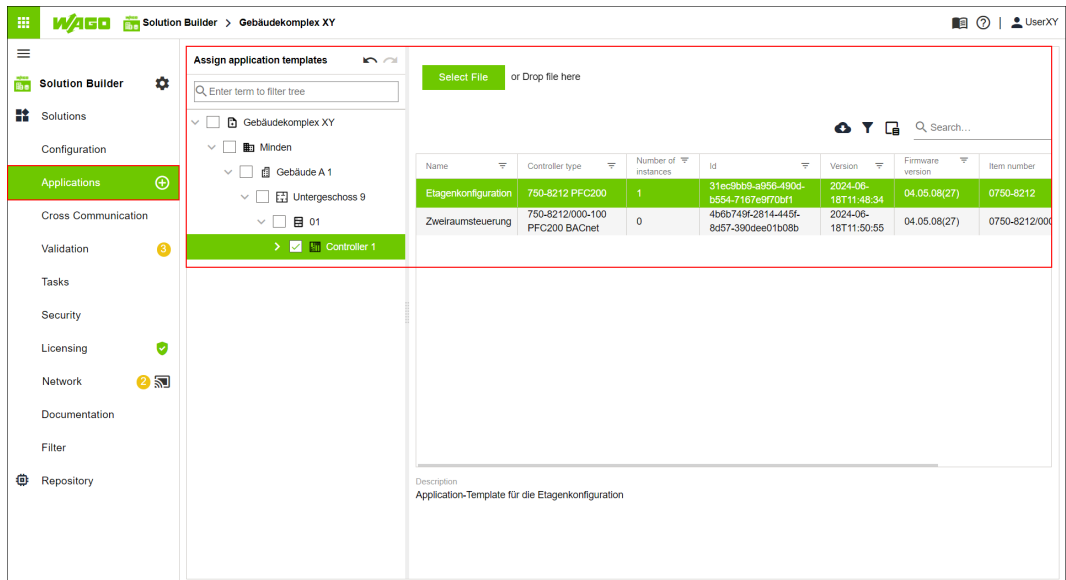
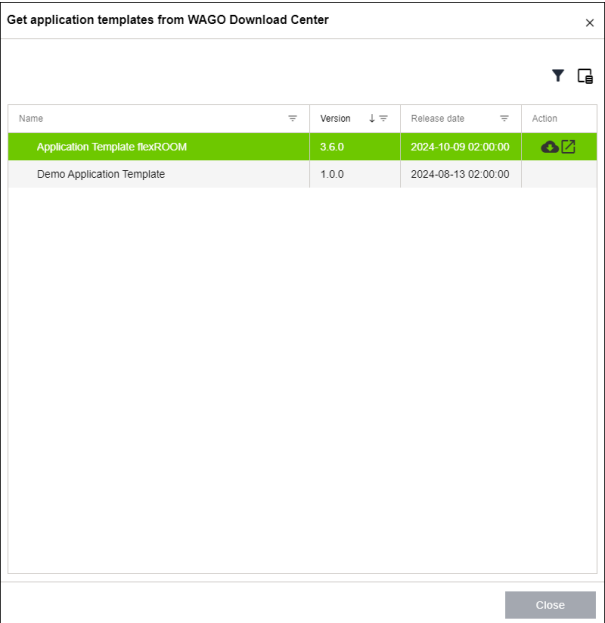
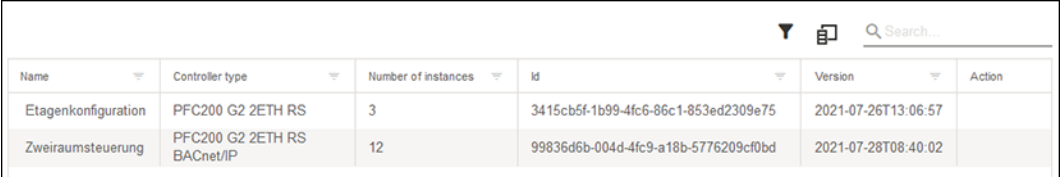


Figure 72: Side Menu > "Applications" Menu Item

Designation	Description
Import application template	Imports an Application template from a file and adds it to the solution.

Designation	Description
Get application templates from the WAGO Download Center	<p>Opens the “Get Application Templates from the WAGO Download Center” dialog. The dialog lists the latest application templates that are available in the WAGO Download Center and can be loaded into the WAGO Solution Builder software.</p> 



Name	Controller type	Number of instances	Id	Version	Action
Etagenkonfiguration	PFC200 G2 2ETH RS	3	3415cb5f-1b99-4fc6-86c1-853ed2309e75	2021-07-26T13:06:57	
Zweiraumsteuerung	PFC200 G2 2ETH RS BACnet/IP	12	99836d6b-004d-4fc9-a18b-5776209cf0bd	2021-07-28T08:40:02	

Figure 73: Side Menu > “Applications” Menu Item > Action Area

Designation	Description
Name	Shows the name of the Application template.
Control system model	Shows controller type for the Application template.
Number of instances	Shows the number of instances of the Application template used within the open solution.
ID	Shows the unique ID of the Application template
Version	Shows the creation timestamp of the Application template; the time-stamp is used for versioning.
Action	<p>The following actions are available:</p> <ul style="list-style-type: none"> Assigning the Application template to controllers selected in the entity tree Deleting the Application template – only possible if no instances of the template are active/present

8.1.4.2.4 “Cross-Communication” Menu Item

The menu item “Cross-communication” is used to configure the exchange of data between WAGO controllers among one another and between WAGO controllers and third-party controllers. BACnet client mappings as well as specially prepared Modbus IP connectors can be connected with one another.

Learn how to configure cross-communication under Configure Cross-communication.

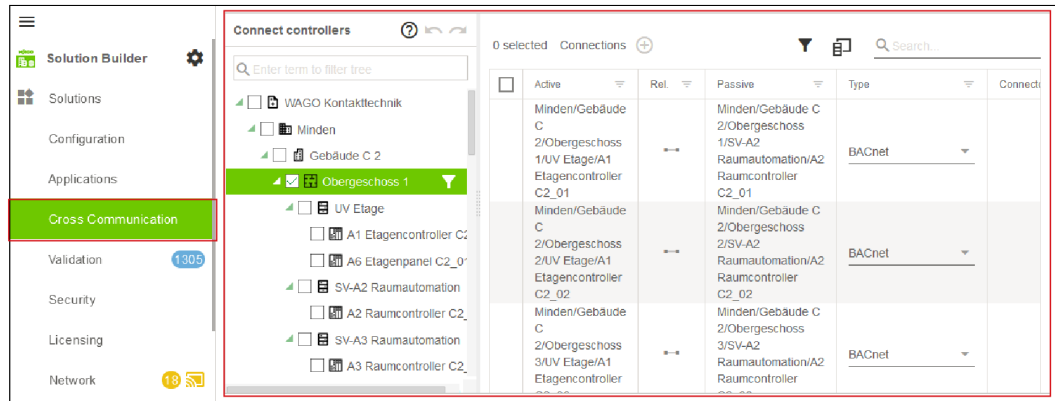


Figure 74: Side Menu > "Cross-communication" Menu Item

The top section "Connections" lists all connections. You can also activate a connection filter using the filter options of the entity tree for a more transparent overview.

Learn how to activate a connection filter under Activate Connection Filter.

Depending on the selected fieldbus protocol, one of the following two items can be selected in the bottom section:

- **"BACnet":**
 Selecting this option enables you to manage the BACnet client mappings for the selected connection. You can also activate a connection filter using the filter options of the entity tree for a more transparent overview. One or more client mappings can be created for each connection.
- **"Modbus TCP":**
 Selecting this option enables you to manage the Modbus IP connectors for the selected connection. If the application offers Modbus IP connectors, several Modbus IP connectors can also be linked for each connection.

8.1.4.2.4.1 "BACnet" Option

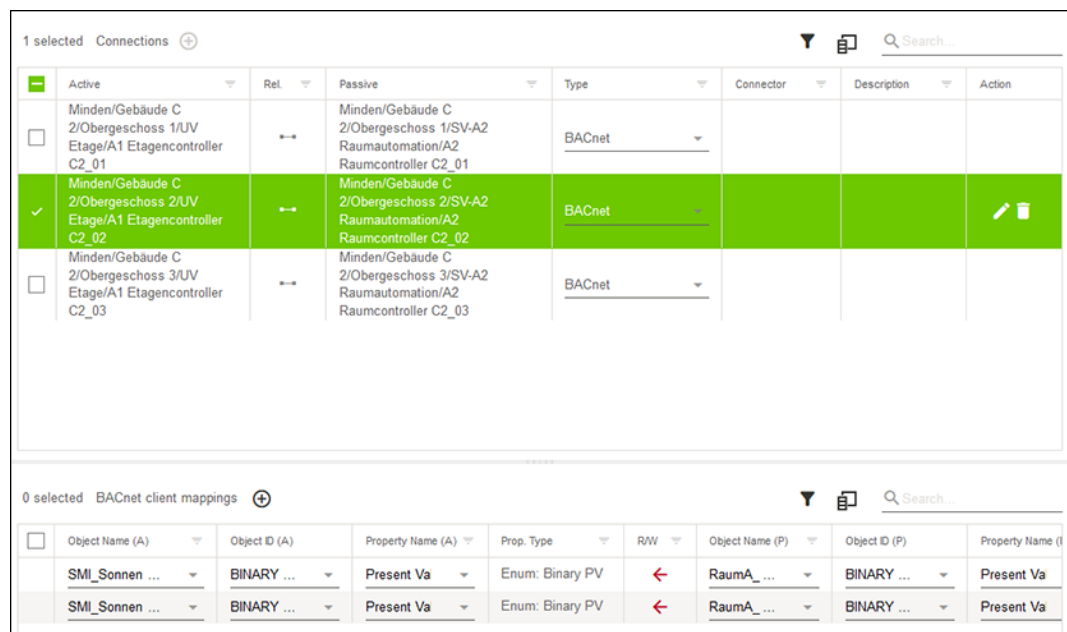


Figure 75: Side Menu > "Cross-communication" Menu Item > Workspace for "BACnet" option

Table 24: Legend for Figure "Side Menu > 'Cross-communication' Menu Item > Workspace for 'BACnet'"

Designation	Description
Connections	
Active	Shows the entity, including path, that possesses the "active" part. "Active" here means that this controller is configured during synchronization. <i>BACnet in the example:</i> This controller receives the client mapping.
Rel.	Shows the connection type. The following are possible: <ul style="list-style-type: none"> • 1:1 • 1:N • N:1
Passive	Shows the passive controller for the connection, including path.
Type	Selection option for configuring a BACnet or Modbus connection.
Connector	Shows the name of the Modbus IP connector (see ☞ "Modbus TCP" Option [p. 82]).
Description	Optional Field: Displays a description of the connection.
Action	The following actions are possible: <ul style="list-style-type: none"> • Edit the standard settings for the connection. Any changes made affect all of the subordinate client mappings as a standard setting. • Delete the connection.
BACnet client mappings	
Object name (A)	Selection option for the BACnet object name for the selected BACnet object on the active controller.
Object ID (A)	Selection option for the BACnet object ID, consisting of the object type and instance ID, for the selected BACnet object on the active controller.
Property name (A)	Selection option for the BACnet property of the selected BACnet object on the active controller that is to be integrated into client mapping.
Object description (A)	Selection option for the BACnet description of the selected BACnet object on the active controller.
Property type	Shows the data types for client mapping. This box is filled in automatically.
R/W	Selection option for client mapping for the read or write mode. A distinction is drawn here as to whether the active controller is to write the value of the configured property (of the selected object) to the property of the passive controller (write, arrow to the right), or whether the value of the passive object is just to be read (read, arrow to the left).
Object name (P)	Selection option for the BACnet object name of the selected BACnet object on the passive controller.
Object ID (P)	Selection option for the BACnet object ID, consisting of object type and instance ID, of the selected BACnet object on the passive controller.
Property name (P)	Selection option for the BACnet property of the selected BACnet object on the passive controller that is to be integrated into client mapping.
Object description (P)	Selection option for the BACnet description of the selected BACnet object on the passive controller.

8.1.4.2.4.2 "Modbus TCP" Option

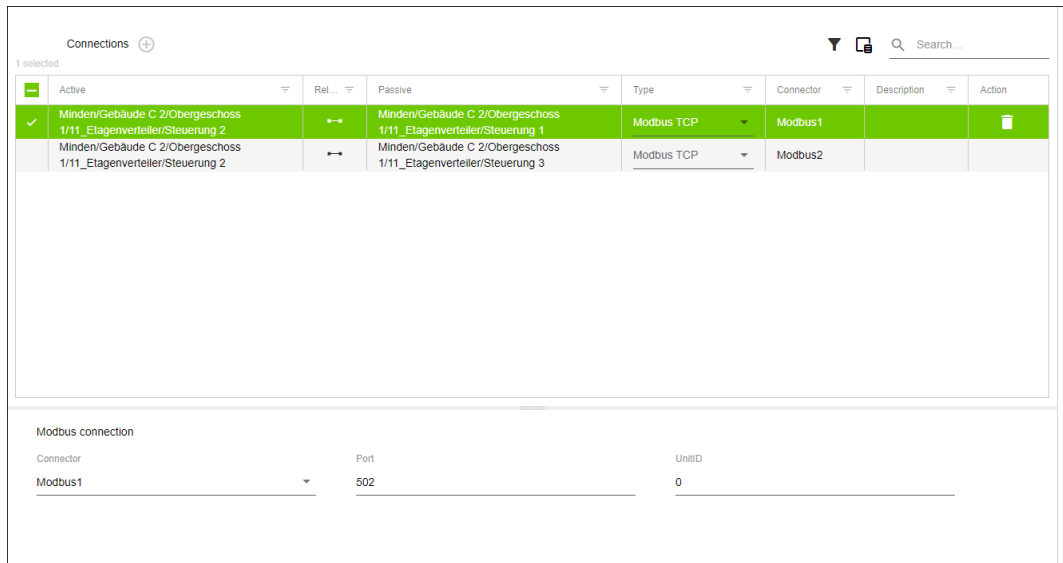


Figure 76: Side Menu > "Cross-communication" Menu Item > Workspace for "Modbus TCP" option

Table 25: Legend for Figure "Side Menu > 'Cross-communication' Menu Item > Workspace for 'Modbus TCP'"

Designation	Description
Connections	
Active	See "BACnet" Option [> 80]
Rel.	
Passive	
Type	
Connector	
Description	
Action	
Modbus connection	
Connector	Selection option for Modbus IP connector
Port	Selection option for port
UnitID	Selection option for Unit ID

You can activate different port numbers in the controller firewall. You can find more information about this in Section ["Modbus Cross-Communication: Activating Different Port Numbers in the Controller Firewall \[> 184 \]](#). You can then use Web-Based Management, for example, to check whether all the settings made have been applied.

8.1.4.2.5 "Validation" Menu Item

The "Validation" menu item can be used to check the results of the offline solution configuration before it is exported to the devices. The results are checked for adherence to various stored rules, such as the requirement of unique IP addresses or controller names in the project.

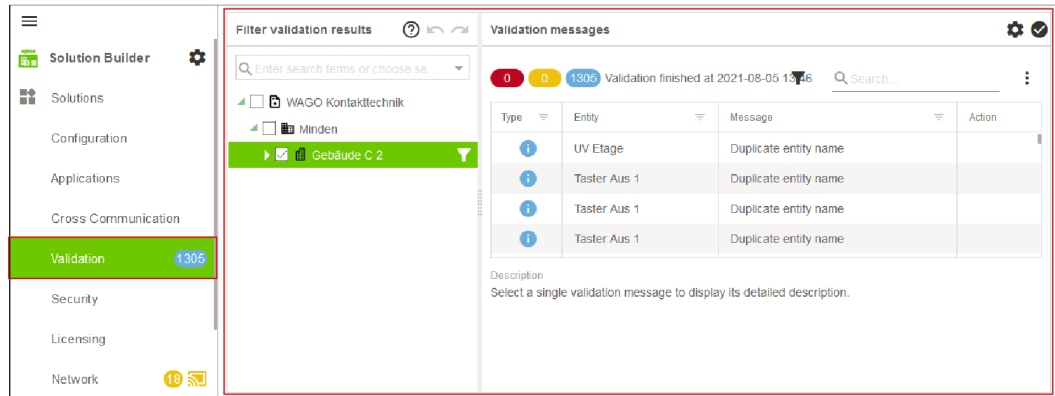




Figure 77: Side Menu > "Validation" Menu Item

Designation	Description
Configure validation	 <p>Opens the "Configure validation" dialog for configuring the validation process.</p> <p>For more information, see "Configure Validation" Dialog [> 84].</p>
Execute validation	 <p>Starts the validation process.</p>

If any erroneous configurations are detected, these are signaled in three message levels (Error, Warning, Info). Through the "Actions" area, a jump mark is stored for every message so you can jump directly to the corresponding configuration page.

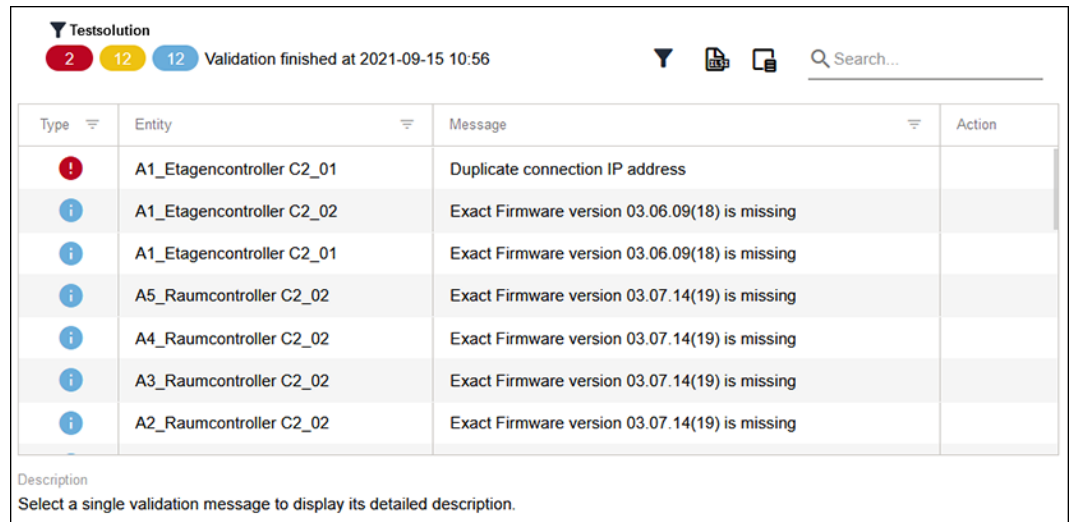





Figure 78: Side Menu > "Validation" Menu Item > Action Area

Designation	Description
Number and type of messages present	   <p>Indicates the number of messages present, sorted according to message type.</p> <p>For more information, see Message Types [> 84].</p>







Designation	Description		
Type	Indicates the message level. There are three different message levels: <ul style="list-style-type: none"> • Info • Warning • Error See table Message Types [p. 84] .		
Entity	Indicates the entity in question.		
Message	Shows a description of the message.		
Action	The following actions are available: <table border="1" style="margin-left: 20px;"> <tr> <td></td> <td>Jumps to the place in the graphical user interface where you can address the message.</td> </tr> </table>		Jumps to the place in the graphical user interface where you can address the message.
	Jumps to the place in the graphical user interface where you can address the message.		

Table 26: Message Types

Icon	Designation	Description
	Number of infos	Displays the number of new information messages.
	Number of warnings	Displays the number of new warning messages.
	Number of errors	Displays the number of new error messages.

8.1.4.2.5.1 “Configure Validation” Dialog

In the “Configure validation” dialog you can enable and disable validation rules and change the message level. You can also define a tag-based filter for every single rule as an option to ensure that only entities with this tag will normally be checked. As an option, all entities with active messages in the entity tree can also be displayed as marked.

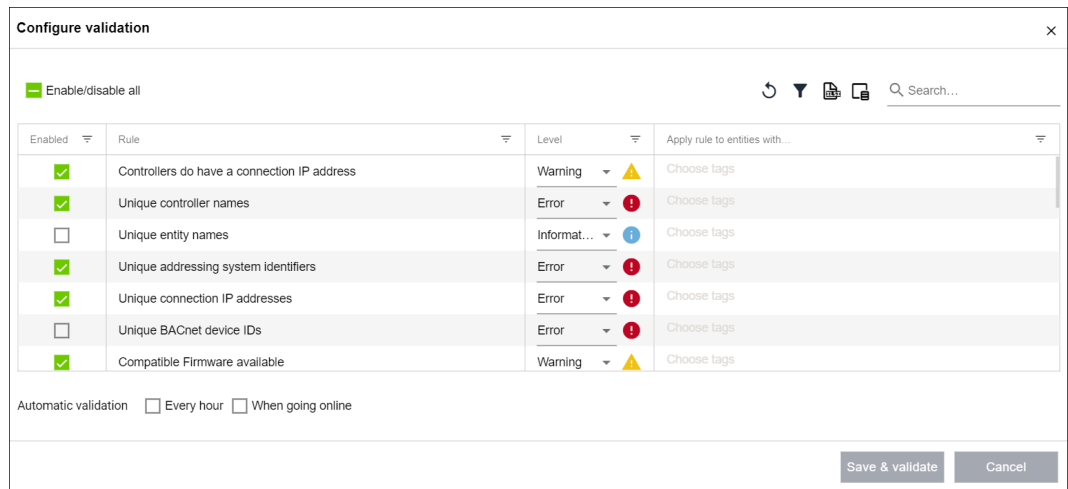


Figure 79: Side Menu > “Validation” Menu Item > “Configure Validation” Dialog

Table 27: Legend for Figure “Side Menu > “Validation” Menu Item > “Configure validation” Dialog”

Designation	Description
Enabled	Activates or deactivates the rule(s).
Rule	Description of rules.
Level	Setting option for defining the message level. You can find further information at Message Types [p. 84] .
Apply rule only to entities with ...	When configured: Applies rule(s) only to entities that have these tags.
Automatic validation	Every hour Automatically checks and validates validation rules once an hour.

Designation		Description
	When going online	Checks and validates the validation rules automatically when going online (see 🔗 "Network" Menu Item [> 93]).

8.1.4.2.6 "Security" Menu Item

The "Security" menu item offers setting options for settings critical to security for a solution and for implemented controllers.

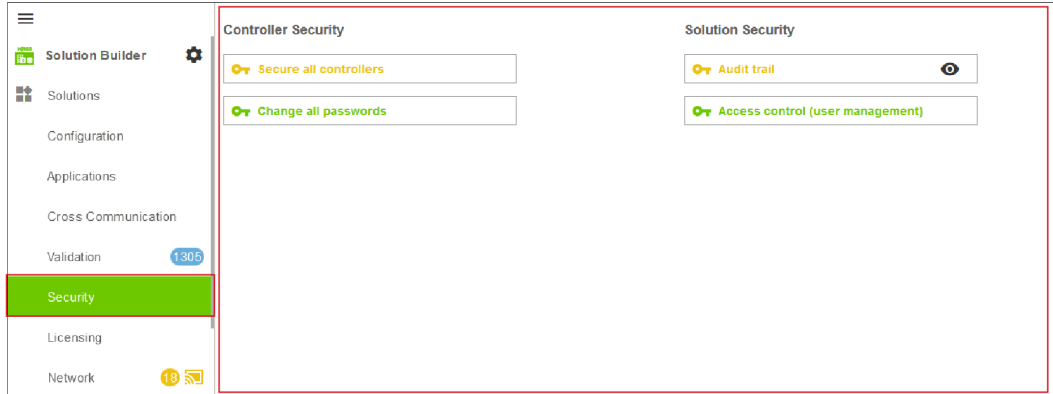






Figure 80: Side Menu > "Security" Menu Item

Designation	Description				
Controller security					
Secure all controllers	<p>Closes all non-essential ports. Activates the firewall for Bridge 1 of the controllers.</p> <p>Activates https, SSH, PLC runtime and PLC Webvisu.</p> <p>Changes are stored in the solution and written to the controller during the next synchronization. The "Network" menu item executes the transfer (see 🔗 "Network" Menu Item [> 93]).</p> <p>A default setting determines which ports on controllers should be closed or opened. Users can modify these settings at their own discretion in a global setting for the WAGO Solution Builder software. The <code>appsettings.json</code> file is located in the WAGO Solution Builder software's installation directory in the Config folder. The changes take effect when the service restarts. You can contact WAGO Technical Support if you need technical assistance.</p> <p>Project-specific settings can also be customized. The file must have the filename <code>customHardening.json</code> and have the same format as the "Hardening" section of the <code>appsettings.json</code> file mentioned above. The file itself must then be uploaded to the WAGO Solution Builder software via the 🔗 "ATTACHMENTS" Tab [> 62].</p> <table border="1"> <tr> <td>Orange button</td> <td>The function was not executed on at least one solution controller.</td> </tr> <tr> <td>Green button</td> <td>The function was executed on all of the controllers implemented for the solution.</td> </tr> </table>	Orange button	The function was not executed on at least one solution controller.	Green button	The function was executed on all of the controllers implemented for the solution.
Orange button	The function was not executed on at least one solution controller.				
Green button	The function was executed on all of the controllers implemented for the solution.				

Designation	Description						
Change all passwords	<p>Changes the passwords for one or more user accounts on all controllers to an identical password, or to different randomly generated passwords.</p> <div data-bbox="699 297 1347 1064" style="border: 1px solid black; padding: 5px;"> <p> Change passwords on all controllers ✕</p> <p>Set all selected passwords on all controllers to a random or the same password. Controllers which have the tag "ProtectPasswords" are not affected. The changes are saved in the solution but not transferred to the controllers immediately. Use the Network page to synchronize all changes.</p> <p><input checked="" type="checkbox"/> Admin password <input checked="" type="checkbox"/> User password <input checked="" type="checkbox"/> Root password</p> <p>Set <input checked="" type="radio"/> different passwords <input type="radio"/> same passwords</p> <p style="text-align: right;">Change Cancel</p> </div> <p>The changes are saved in the solution but not transferred to the controllers immediately. The "Network" menu item executes the transfer (see "Network" Menu Item [p. 93]).</p> <p>You can customize the default settings for automatic password assignment. To do so, open the file <code>appsettings.json</code> under <code>C:\Program Files\WAGO Software\WAGO Solution Builder\WSB\Config\appsettings.json</code> and make the parameter settings you want in the source code under "Security/Password."</p> <p>If you want controllers to be excluded from automatic password assignment, they must be tagged with ProtectPasswords (see "TAGS" Tab [p. 60]).</p> <p>If the admin/root password has been changed, the new password is applied automatically to the WAGO Solution Builder software's connection settings after synchronization with the controller.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">Orange button</td> <td>The function was not executed for at least one password on a solution controller.</td> </tr> <tr> <td>Green button</td> <td>The function was executed for all passwords on all of the controllers configured for the solution.</td> </tr> </table>	Orange button	The function was not executed for at least one password on a solution controller.	Green button	The function was executed for all passwords on all of the controllers configured for the solution.		
Orange button	The function was not executed for at least one password on a solution controller.						
Green button	The function was executed for all passwords on all of the controllers configured for the solution.						
Solution security							
Change record	<p>Enables or disables logging of activities in the solution (also: Audit Trail).</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%; text-align: center;"></td> <td>Displays the change record. For more information, see "Audit Trail" Dialog [p. 87].</td> </tr> <tr> <td>Orange button</td> <td>The change record is disabled.</td> </tr> <tr> <td>Green button</td> <td>The change record is enabled.</td> </tr> </table>		Displays the change record. For more information, see "Audit Trail" Dialog [p. 87] .	Orange button	The change record is disabled.	Green button	The change record is enabled.
	Displays the change record. For more information, see "Audit Trail" Dialog [p. 87] .						
Orange button	The change record is disabled.						
Green button	The change record is enabled.						
Access Control (User Management)	<p>Opens the "Access Control (User Management)" dialog for managing user access and roles for the active solution.</p> <p>For more information, see "Access Control" Dialog [p. 87].</p>						

Designation	Description	
	Orange button	User management is disabled.
	Green button	User management is enabled.

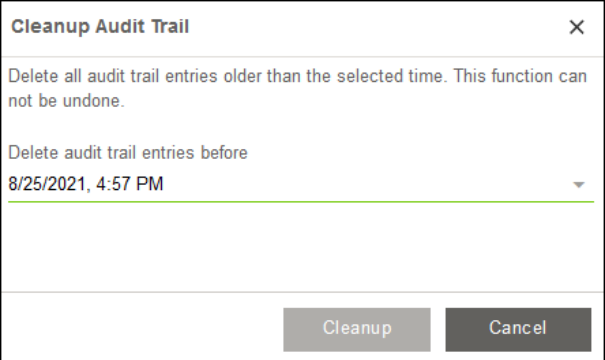
8.1.4.2.6.1 "Audit Trail" Dialog

The "Audit trail" dialog contains all of the activities recorded within the solution.

Time	Table	Action	User	Display Name	Entity	Changes	Row Data
2021-09-03 11:44	Entity	I	MD	MD	Testsolution		ApplicationTemplateId: <null>, Descriptio SLN, Id: 1, Name: Testsolution, ParentId
2021-09-03 11:44	Tag	I	MD	MD	absorption		DefaultValue: <null>, Id: 179, Name: abs
2021-09-03 11:44	Tag	I	MD	MD	reheating		DefaultValue: <null>, Id: 178, Name: reh
2021-09-03 11:44	Tag	I	MD	MD	occupancyIndicator		DefaultValue: <null>, Id: 177, Name: occ
2021-09-03 11:44	Tag	I	MD	MD	occupied		DefaultValue: <null>, Id: 176, Name: occ
2021-09-03 11:44	Tag	I	MD	MD	oil		DefaultValue: <null>, Id: 175, Name: oil, I
2021-09-03 11:44	Tag	I	MD	MD	openLoop		DefaultValue: <null>, Id: 174, Name: ope
2021-09-03 11:44	Tag	I	MD	MD	outside		DefaultValue: <null>, Id: 173, Name: outs
2021-09-03 11:44	Tag	I	MD	MD	parallel		DefaultValue: <null>, Id: 172, Name: par
2021-09-03 11:44	Tag	I	MD	MD	perimeterHeat		DefaultValue: <null>, Id: 171, Name: peri
2021-09-03 11:44	Tag	I	MD	MD	pf		DefaultValue: <null>, Id: 170, Name: pf, f

Figure 81: Side Menu > "Security" Menu Item > "Audit trail" Dialog

Table 28: Legend for Figure "Side Menu > "Security" Menu Item > "Audit Trail" Dialog"

Designation	Description
[Cleanup]	Permanently deletes all entries in the change record prior to the specified time. 
Time	Shows the time stamp of the change.
Table	Shows the type of element affected by the change.
Action	Shows what type of change was made.
User	Displays the user name of the user who performed the changes.
Display Name	Shows the display name of the user who performed the changes.
Entity	Displays the changed entity.
Changes	Shows all changes that were made and the effects of these changes on other points within the solution.
Row data	Shows the impacted points in the database.

8.1.4.2.6.2 "Access Control" Dialog

In the "Access Control" dialog, you can manage user access and user roles. In addition to accounts created by users themselves ("internal users"), it is also possible to manage user accounts and log into them from an external authentication system ("external users").

If a password is assigned to a solution when it is created, user management is enabled automatically, and the solution owner ("Owner" role) is created. When user management is switched on, there must always be at least one user with the "Owner" role.

If an initial user is created later with the "Owner" role, user management will be enabled automatically and cannot be disabled afterwards.

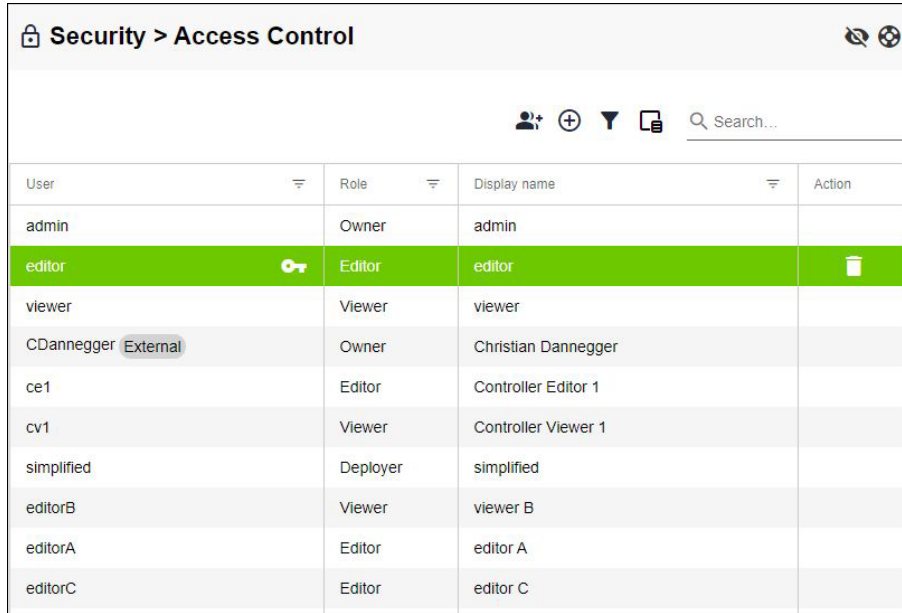


Figure 82: Side Menu > "Security" Menu Item > "Access Control" Dialog

Table 29: Legend for Figure "Side Menu > 'Security' Menu Item > 'Access Control' Dialog"

Designation	Description
	Imports usernames from an external authentication system. As a general rule, the suffix "external" is added for all external users. In the login process, these users have secondary priority, i.e., an internal user is always logged in before an external user. The corresponding external authentication system must be selected for the solution in advance in the "Authentication Settings" Area [51] and stored as a fixed rule. For external users, the username and password can only be edited in the corresponding authentication system. Only the username is displayed in the WAGO Solution Builder software!
User	Option for entering the username
	Assigns a password for user access.
Role	Option for selecting the user's role.
Display Name	Option for entering a display name that differs from the username.
Action	The following actions are available:
	Deletes the user.

User Roles

The following user roles can be selected:

Table 30: User Roles

Designation	Description
Owner	Solution owner This user role has the following properties: <ul style="list-style-type: none"> • Cannot be deleted in the solution. • Can edit user settings. • Can edit the solution without restriction.
Editor	Solution editor This user role has the following properties: <ul style="list-style-type: none"> • Can edit the solution without restriction.
Viewer	Solution viewer This user role has the following properties: <ul style="list-style-type: none"> • Has read-only access to the solution.
Locked	User locked out of solution This user role has the following properties: <ul style="list-style-type: none"> • Has no authorization privileges.
Deployer	User of a solution with restricted access rights This user role has the following properties: <ul style="list-style-type: none"> • Can open the solution via a direct link. • Cannot edit anything in the solution. • Has limited access to the "Applications" and "Network" menu items, as well as the "Repository" menu with specific tabs. This user role is only used for uploading a current application template in a specific solution and then installing it on the associated controllers.

8.1.4.2.7 "Licensing" Menu Item

The "Licensing" menu item can be used to manage and assign the licenses for all of the existing controllers. The WAGO Solution Builder software shares the license repository with other WAGO software installed on the same operating system.

This menu item consists of two tabs:

- "SOLUTION LICENSES" tab
- "LICENSE REPOSITORY" tab

Both tabs also have the following general buttons:



Figure 83: Side Menu > "Licensing" Menu Item > General Buttons

Designation	Description
[License Agreement]	Opens the "WAGO Software License Agreement" (General Terms and Conditions of Use) as a PDF.

Designation	Description
<p>[Add Licenses]</p>	<p>Opens the “Add Licenses” dialog. In this dialog, you can enter all the licenses you have purchased from WAGO and add them to the common license repository for the operating system being used. The corresponding license key can be found on your license certificate. You can enter multiple license keys in sequence, separated by spaces.</p> <p>In the dialog itself, you also have to enter the corresponding customer name for the license certificate along with the license key. In addition, licenses that have been entered can be reserved directly for a specific solution. This lets you determine which licenses should be used for which customer project.</p> <div data-bbox="703 517 1121 1261" style="border: 1px solid #ccc; padding: 10px; margin: 10px 0;"> </div> <p>[Check Connection] checks whether the WAGO license server on the Internet can be reached. This process is necessary for some license keys.</p> <p>[Add Licenses] adds the licenses you entered to the license repository of the operating system being used, making them then available in the WAGO Solution Builder software.</p>

“SOLUTION LICENSES” Tab

The “SOLUTION LICENSES” tab lists all the licenses that are available for the open solution. Both reserved licenses and licenses used on the controllers are listed here. The list is sorted by device and shows a comparison of the license requirements for a device and the number of licenses actually assigned. The license requirements are determined from the number of assigned Application templates.

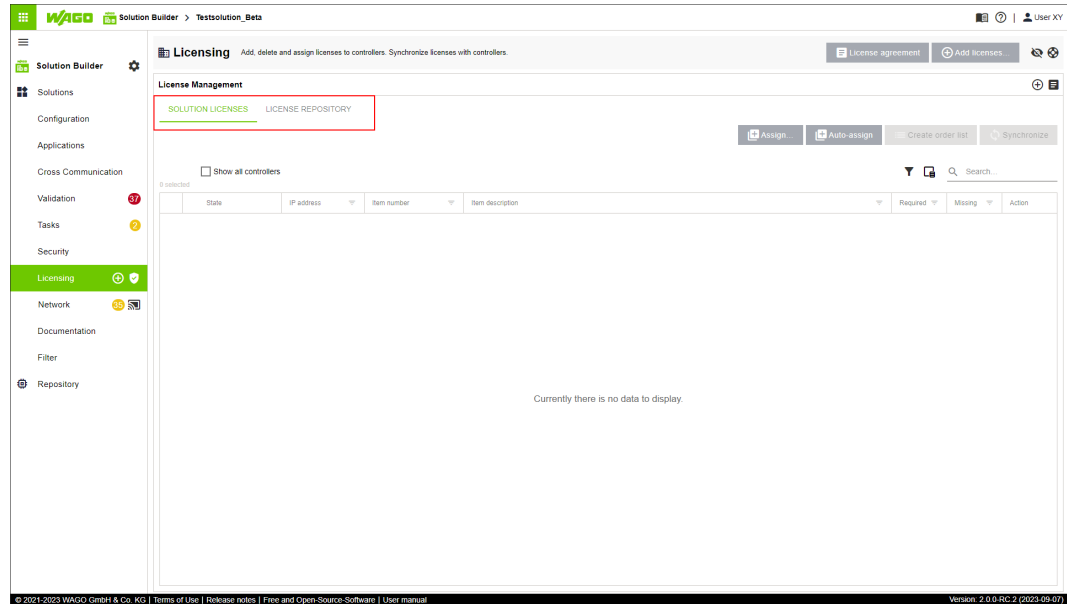


Figure 84: Side Menu > “Licensing” Menu Item > “SOLUTION LICENSES” Tab

Table 31: Legend for Figure “Side Menu > “Licensing” Menu Item > “SOLUTION LICENSES” Tab”

Designation	Description												
Assign	<p>Manually assigns a license to a device selected on the “SOLUTION LICENSES” tab. All available licenses are listed. The license can be added to the selected device.</p> <div data-bbox="703 1263 1121 1944" style="border: 1px solid gray; padding: 5px;"> <p>Available licenses ✕</p> <p><input type="checkbox"/> Show other reserved licenses ▼</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">Item number</th> <th style="width: 40%;">Item description</th> <th style="width: 10%;">Amount</th> <th style="width: 30%;">Action</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">🔍</td> <td style="text-align: center;">🔍</td> <td style="text-align: center;">🔍</td> <td></td> </tr> <tr> <td colspan="4" style="text-align: center;">No data</td> </tr> </tbody> </table> <p style="text-align: right; margin-top: 10px;">Close</p> </div>	Item number	Item description	Amount	Action	🔍	🔍	🔍		No data			
Item number	Item description	Amount	Action										
🔍	🔍	🔍											
No data													

Designation	Description
Auto-Assign	Automatically assigns available licenses to the license requirements that have been determined. Licenses reserved for the open solution are used first. Available licenses are then taken from the license repository.
Create Item List	This function is not supported at this time.
Synchronize	Starts license synchronization between the solution and the devices in the network. The license configuration previously created offline is then transferred to the devices.

“LICENSE REPOSITORY” Tab

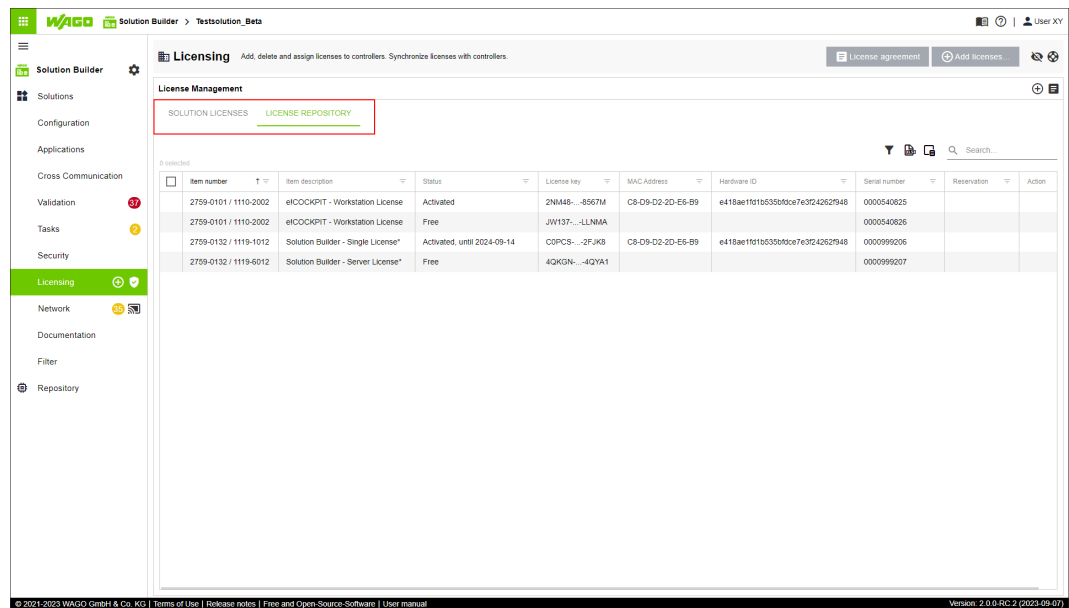


Figure 85: Side Menu > “Licensing” Menu Item > “LICENSE REPOSITORY” Tab

This tab shows all the licenses present in the local license repository for the operating system being used. The following properties are also displayed for each entry:

- Item Number
- Item Description
- Status
- License Key
- MAC Address
- Hardware ID
- Serial Number
- Reservation
- Action

Existing entries can be sorted and filtered by all of these properties.

8.1.4.2.8 “Network” Menu Item

The “Network” menu item offers all the operations involving active access to the network, except for licensing.

The operations with active network access include:

- Controller configurations created offline beforehand, and job-based synchronization of them
- Device scans in the network
- The dedicated DHCP server for making new devices accessible

All the controllers configured in the solution appear in the device list. For example, to synchronize a selected area of a building, you can enable a filter in the entity tree for the area.

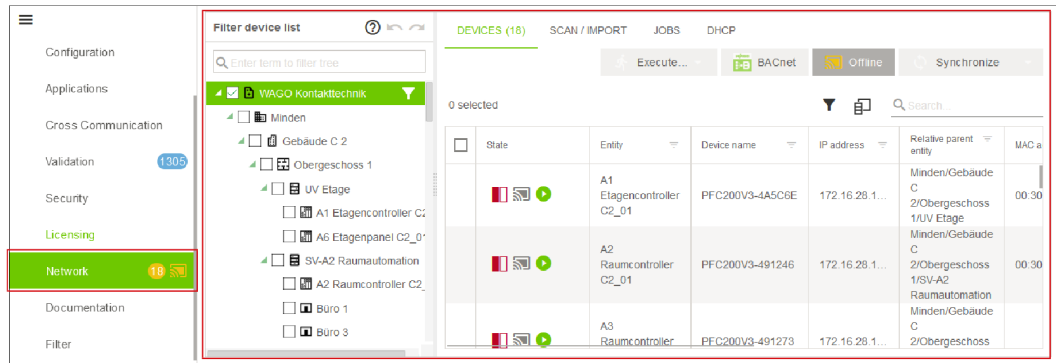








Figure 86: Side Menu > “Network” Menu Item

Table 32: Icon Legend for “Network” Menu Item

Icon	Designation	Description
	Busy	Indicates that the controller application status is “RUN.”
	Stopped	Indicates that the controller application status is “Stopped.”
	Warning	Indicates that warnings are present.
	Solution changed	Indicates that the controller configuration in the WAGO Solution Builder software has a newer timestamp than the controller configuration on the device. To activate the controller configuration from the WAGO Solution Builder software, it is necessary to perform synchronization in the controller direction.
	Controller changed	Indicates that the controller configuration on the device has a newer timestamp than the controller configuration in the WAGO Solution Builder software. To apply the controller configuration from the WAGO Solution Builder software, it is necessary to perform synchronization in the WAGO Solution Builder software direction.
	Solution and controller changed	Indicates that the timestamps for some of the components of the controller configuration are more recent in the WAGO Solution Builder software, and some are more recent on the device. It is advisable to perform detailed synchronization to achieve data consistency. This process requires the user to specify the direction of data record synchronization. For more information, see “Compile Configuration Values of Application Parameters” Dialog [> 99] .
	Synchronized	Indicates that the data in the WAGO Solution Builder software and on the controller are synchronized.
		Indicates that the network contains a WAGO controller without an application; the WAGO Solution Builder software views this as “permanently synchronous,” and its state cannot change.
	Controller disconnected	Indicates that the controller is disconnected from the network and offline. No monitoring occurs, so there is no status information.

Icon	Designation	Description
	Controller not connected	Indicates that the controller is disconnected from the network. Monitoring is performed, so status information is available.
	Controller connected	Indicates that the controller is connected to the network and online. Monitoring is performed, so status information is available.
	Solution offline	Indicates that the solution is in "Offline" mode. The WAGO Device Communication Service software is not accessible.
	Use solution value for all parts and transfer to device	Indicates that the selected configuration is being transferred from the WAGO Solution Builder software to the controller. This process overwrites the existing controller configuration.
	Use device value for all parts and transfer to solution	Indicates that the selected configuration is being transferred from the controller to the WAGO Solution Builder software. This process overwrites the existing WAGO Solution Builder software configuration.
	Open a dialog to transfer each parameter separately	Opens a dialog for selecting individual values to transfer (synchronization). For more information, see ☰ "Compile Configuration Values of Application Parameters" Dialog [p. 99] .

"Online/Offline" Action: Full Selection

By default, the "Online/Offline" action is executed fully for all listed controllers. For example, a single mouse click sets the status of all controllers to "Online" and connects them to the network. This centralized step starts monitoring for all controllers.

"Online/Offline" Action: Selective

In certain situations, it may be necessary to monitor individual controllers separately. To do so, it is necessary to assign the individual controllers their own statuses manually. This operation is then executed separately from the full selection. This action can be executed as follows:

- **Selective status change via context menu:**
Right-click on the corresponding controller(s) and select "Online/Offline" from the context menu. The action is executed exclusively for the selected controller(s).
- **Selective status change via button:**
Click on the corresponding controller(s) and then on the "Online/Offline" button. The action is executed exclusively for the selected controller(s).

If multiple controllers with different statuses are selected, the button shows the "Offline" status. The button ("Online/Offline") display changes if one or more controllers with identical statuses are selected.

"Get Status Once" Action

This action provides a snapshot of the current status. This snapshot can be read off the time-stamp in the "Status received on" column.

Note

General information about icons and messages in the side menu

For more information about the meanings of the icons and messages in the side menu, see [Side menu open \[p. 35\]](#).

Note

Visual representation of WAGO controllers without an application!

The WAGO Solution Builder software also supports WAGO controllers without an application. These asynchronous controllers without a device model and Application template are permanently marked with “synchronous” icon in the overview, highlighted in gray, because their state cannot change. This defined status serves to make these specific controllers visible and to distinguish them visually from other controllers!

8.1.4.2.8.1 “CONTROLLER” Tab

The “CONTROLLER” tab lists all the controllers for a solution and selected filters. Besides the status display of the individual controllers and the details of their configuration, the connection status of a solution can also be changed on this tab, for example by switching the solution to “Online” mode.

State	Entity	Device name	Latest backup	IP address	Relative parent entity	MAC address	Device ID	WBM	Current Firmware Version	Required Firmware Version
✓	A6_Etagen C2_01			172.16.2...	2/Obergesc... 1/15_Raum... Minden/Ge... C 2/Obergesc... 1/11_Etage...		200104			03.07.14(19)
□	A2_Raumc C2_02	PFC20...		172.16.2...	Minden/Ge... C 2/Obergesc... 2/22_Raum... Minden/Ge... C 2/Obergesc... 2/21_Etage...	00:30:...	200135		03.07.14...	03.07.14(19)
□	A1_Etagen C2_02	PFC20...		172.16.2...	Minden/Ge... C 2/Obergesc... 2/21_Etage...	00:30:...	200133		03.06.11...	03.06.09(18)
✓	A4_Raumc C2_02	PFC20...		172.16.2...	Minden/Ge... C 2/Obergesc... 2/24_Raum...	00:30:...	200137		03.07.14...	03.07.14(19)
□	A5_Raumc C2_02	PFC20...		172.16.2...	Minden/Ge... C 2/Obergesc... 2/25_Raum...	00:30:...	200138		03.07.14...	03.07.14(19)
□	A3_Raumc C2_02	PFC20...		172.16.2...	Minden/Ge... C 2/Obergesc... 2/23_Raum...	00:30:...	200136		03.07.14...	03.07.14(19)
□	A6_Etagen C2_02	TP600-...		172.16.2...	Minden/Ge... C 2/Obergesc... 2/21_Etage...	00:30:...	200134		03.06.19...	03.07.14(19)

Figure 87: Side Menu > “Solutions” Menu > “Network” Menu Item > “CONTROLLER” Tab

Designation	Description
[Firmware update]	Opens the “Firmware update” dialog to update the firmware for the controllers selected in the list. For more information, see “Firmware Update” Dialog [p. 100] .

Designation	Description						
[Backup...]	<p>Opens the “Backup” dialog. Here you can create controller backups. You can also define time-based backup routines.</p> <p>For more information, see ☞ “Backup” Dialog [▶ 101].</p> <table border="1"> <tr> <td>Backup Manager</td> <td> <p>Opens the “Backup Manager” dialog for managing controller backups.</p> <p>For more information, see ☞ “Backup Manager” Dialog [▶ 102].</p> </td> </tr> <tr> <td>Restore</td> <td> <p>Opens the “Restore” dialog to restore previous controller backups.</p> <p>The “Restore” dialog shows all backups saved in the WAGO Solution Builder software for the selected controller. After selecting a backup, you can initiate a restore.</p> </td> </tr> </table>	Backup Manager	<p>Opens the “Backup Manager” dialog for managing controller backups.</p> <p>For more information, see ☞ “Backup Manager” Dialog [▶ 102].</p>	Restore	<p>Opens the “Restore” dialog to restore previous controller backups.</p> <p>The “Restore” dialog shows all backups saved in the WAGO Solution Builder software for the selected controller. After selecting a backup, you can initiate a restore.</p>		
Backup Manager	<p>Opens the “Backup Manager” dialog for managing controller backups.</p> <p>For more information, see ☞ “Backup Manager” Dialog [▶ 102].</p>						
Restore	<p>Opens the “Restore” dialog to restore previous controller backups.</p> <p>The “Restore” dialog shows all backups saved in the WAGO Solution Builder software for the selected controller. After selecting a backup, you can initiate a restore.</p>						
[Execute...]	Executes scripts on the selected controller.						
[BACnet]	<p>Opens the WAGO BACnet Configurator for editing the selected controller.</p> <p>In this way, besides manual changes to the BACnet configuration that unlink that configuration from the Application template, you can also check the results of a BACnet configuration prior to synchronization. For example, the final use of the <i>BACnet object name</i> can be checked using the addressing system code.</p> <p>Note: As soon as the WAGO BACnet Configurator software is closed after synchronization, the following prompt appears: “Do you want to save and synchronize modifications back to WAGO Solution Builder?” Respond with [Discard and Exit] if you do not wish to make any changes!</p>						
[Offline]	<p>Switches between the “Online” and “Offline” mode.</p> <p>The “Online” mode activates a monitoring job that regularly queries the current status of all the solution’s controllers. These include the “RUN status” or the current firmware version, for example. The “Offline” mode is also required in order to start a synchronization job and perform a manual firmware update, as well as for the Backup-and-Restore operation.</p>						
[Synchronize]	<table border="1"> <tr> <td>Synchronize changes</td> <td>Synchronizes only the modified configuration components for the selected controller.</td> </tr> <tr> <td>Synchronize all</td> <td>Synchronizes the modified and non-modified (i.e., all) configuration components for the selected controller.</td> </tr> <tr> <td>Merge manually</td> <td> <p>Opens the “Synchronize differences” dialog for performing a manually merged synchronization procedure.</p> <p>For more information, see ☞ “Synchronize Differences” Dialog [▶ 98].</p> </td> </tr> </table>	Synchronize changes	Synchronizes only the modified configuration components for the selected controller.	Synchronize all	Synchronizes the modified and non-modified (i.e., all) configuration components for the selected controller.	Merge manually	<p>Opens the “Synchronize differences” dialog for performing a manually merged synchronization procedure.</p> <p>For more information, see ☞ “Synchronize Differences” Dialog [▶ 98].</p>
Synchronize changes	Synchronizes only the modified configuration components for the selected controller.						
Synchronize all	Synchronizes the modified and non-modified (i.e., all) configuration components for the selected controller.						
Merge manually	<p>Opens the “Synchronize differences” dialog for performing a manually merged synchronization procedure.</p> <p>For more information, see ☞ “Synchronize Differences” Dialog [▶ 98].</p>						
Status	<p>Indicates the status of the controller and the synchronization with the WAGO Solution Builder software.</p> <p>For the icon legend, see the ☞ “Network” Menu Item [▶ 93].</p>						
Entity	Shows the name of the controller in the entity tree.						
Device name	<p>Shows the hostname of the controller in the network.</p> <p>Displaying the hostname requires an active monitoring job that has been successfully completed.</p>						
IP address	Shows the active IP address of the controller.						
Relatively higher-level entity	Shows the position of the controller in the entity tree.						
MAC address	<p>Shows the controller’s MAC address.</p> <p>Displaying the MAC address requires an active monitoring job that has been successfully completed.</p>						
Device ID	Shows the BACnet device ID of the controller.						
WBM	Shows the link to Web-based management for the controller.						

Designation	Description
Current firmware version	Shows the current firmware version for the controller. Displaying the current firmware version requires an active monitoring job that has been successfully completed.
Required firmware version	Shows the controller firmware version required for the application.
Application name	Shows the name of the application.
Job	Shows all active jobs for the selected device.

8.1.4.2.8.1.1 “Synchronize Differences” Dialog

In the “Synchronize differences” dialog, you can review in detail which configuration components require synchronization and the direction of the synchronization and specify these before the synchronization process starts.

When selecting the direction of synchronization, you can transfer an updated application transferred to the controller, for example; in contrast, the current application parameters should be taken from the controller, since changes were made on the controller during operation.

You can also manually mark individual configuration components for synchronization. To do so, you must check the “Solution change,” “Controller changes” and “Synchronized” boxes. After setting the parameters, you can start the synchronization procedure by clicking the corresponding button.

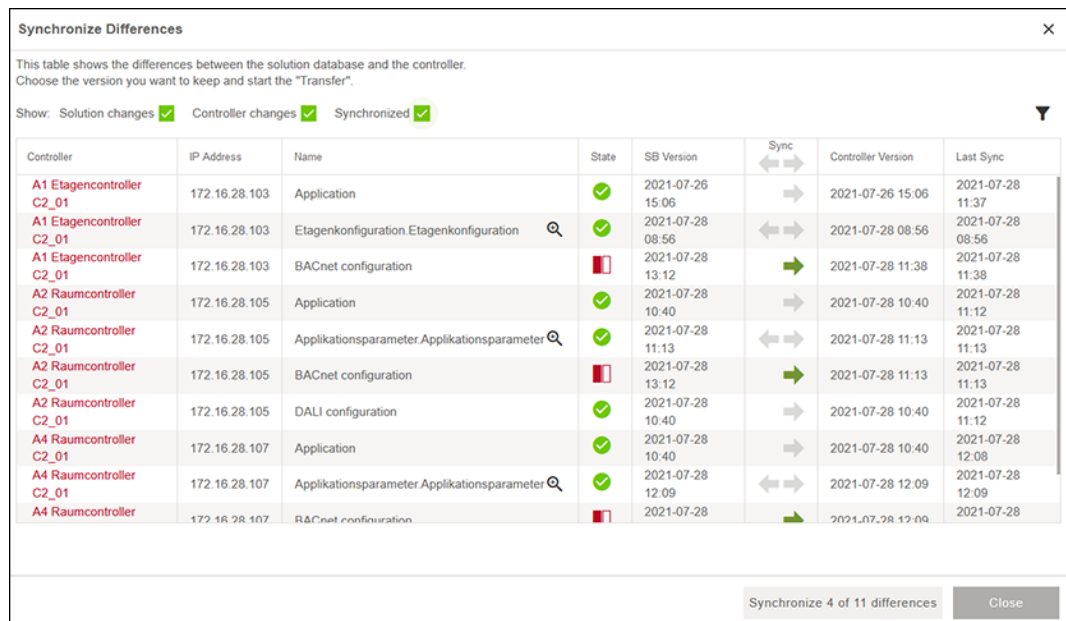



Figure 88: Side Menu > “Solutions” Menu Item > “Network” Menu Item > “CONTROLLER” Tab > “Synchronize Differences” Dialog

Designation	Description	
Solution changes	<input type="checkbox"/>	Does not show entries with the status “Solution changed.”
	<input checked="" type="checkbox"/>	Shows entries with the status “Solution changed.”
Controller changes	<input type="checkbox"/>	Does not show entries with the status “Controller changed.”
	<input checked="" type="checkbox"/>	Shows entries with the status “Controller changed.”
Synchronized	<input type="checkbox"/>	Does not show entries with the status “Synchronized.”

Designation	Description
	 Shows entries with the status "Synchronized."
Controller	Shows the name of the controller.
IP address	Shows the controller IP address.
Name	Shows the configuration type.
Status	Shows the status of the solution and device. For the icon legend, see the "Network" Menu Item [> 93] .
SB version	Shows the timestamp of the configuration in the WAGO Solution Builder software.
Sync	Indicates the direction for a configuration synchronization. For the icon legend, see the "Network" Menu Item [> 93] .
Controller version	Shows the configuration's timestamp in the controller.
Last synchronization	Shows the timestamp of the last synchronization between the WAGO Solution Builder software and the controller. The synchronization relates to the current configuration.

8.1.4.2.8.1.1.1 "Compile Configuration Values of Application Parameters" Dialog

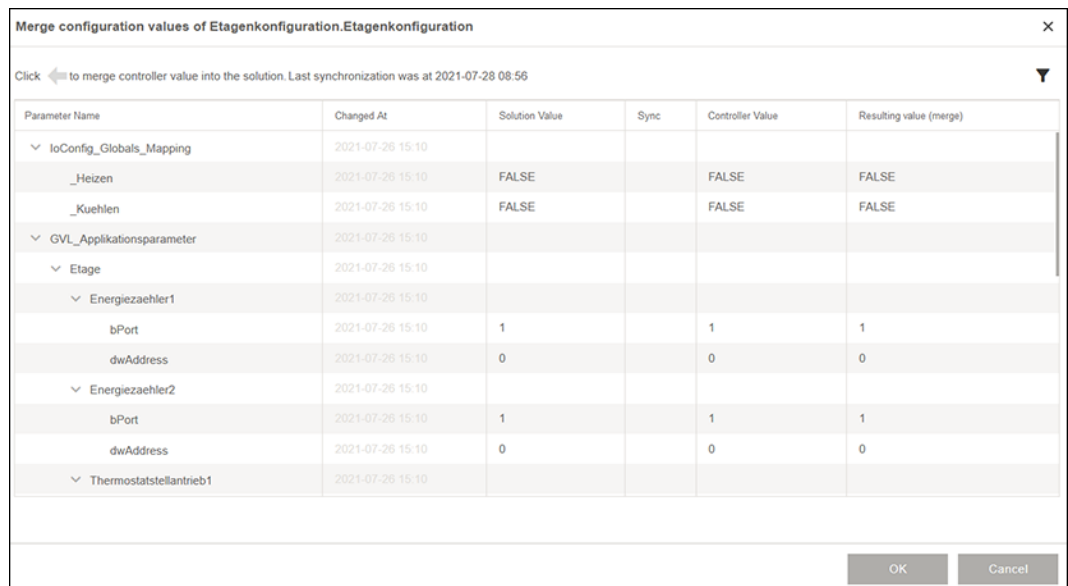


Figure 89: Side Menu > "Network" Menu Item > "CONTROLLER" Tab > Compile Manually > "Compile Configuration Values of Application Parameters" Dialog

Table 33: Legend for Figure "Side Menu > "Network" Menu Item > "CONTROLLER" Tab > Compile Manually > "Compile Configuration Values of Application Parameters" Dialog"

Designation	Description
Parameter name	Shows the application name.
Changed at	Displays the time stamp for the last change of the parameter.
Solution value	Displays the value of the parameter in the solution.
Sync	Shows the marked position and direction for synchronization.
Controller value	Displays the value of the parameter in the controller.
Result value (merge)	Displays the result value after synchronization between the controller and the solution.

8.1.4.2.8.1.1.2 "Compile Configuration Values of Device Parameters" Dialog

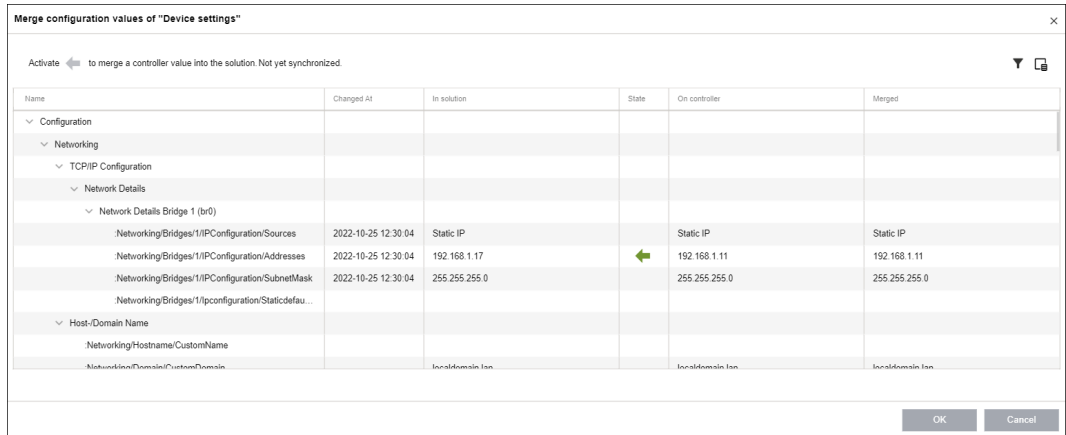


Figure 90: Side Menu > "Network" Menu Item > "CONTROLLER" Tab > Compile Manually > "Compile Configuration Values of Device Parameters" Dialog

Table 34: Legend for Figure "Side Menu > "Network" Menu Item > "CONTROLLER" Tab > Compile Manually > "Compile Configuration Values of Device Parameters" Dialog"

Designation	Description
Name	Shows the application name.
Changed at	Displays the time stamp for the last change of the application parameter.
In the solution	Displays the value of the application parameter in the solution.
State	Shows the marked position and direction for synchronization.
On the controller	Displays the value of the application parameter in the controller.
Merged	Displays the result value after synchronization between the controller and the solution.

8.1.4.2.8.1.2 "Firmware Update" Dialog

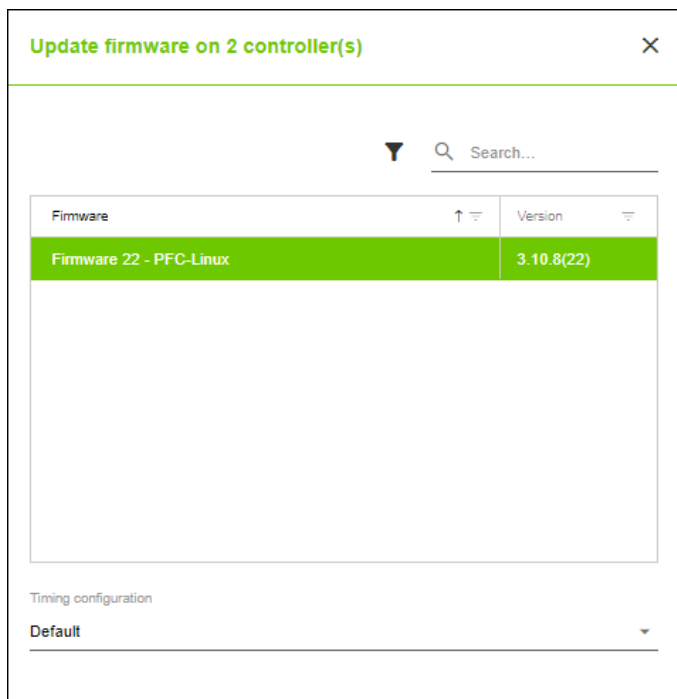


Figure 91: Side Menu > "Network" Menu Item > "DEVICES" Tab > "Firmware Update" Dialog

Table 35: Legend for Figure "Side Menu > "Network" Menu Item > "DEVICES" Tab > "Firmware Update" Dialog"

Designation	Description	
Firmware	Displays a selection list containing all available firmware inventories in the repository for the selected controller(s).	
Version	Shows the software version of the firmware.	
Timing configuration	Default	Default setting for firmware update. This setting normally does not have to be changed.
	Custom 1 (Default * 2)	Doubling of the timeouts for firmware update. This setting can be used for very slow connections.
	GSM	Connection timing for firmware updates via GSM connections. This setting is appropriate for mobile communications connections.

8.1.4.2.8.1.3 "Backup" Dialog

In the "Backup" dialog, you can create controller backups. You can also specify time intervals for recurring backup routines.

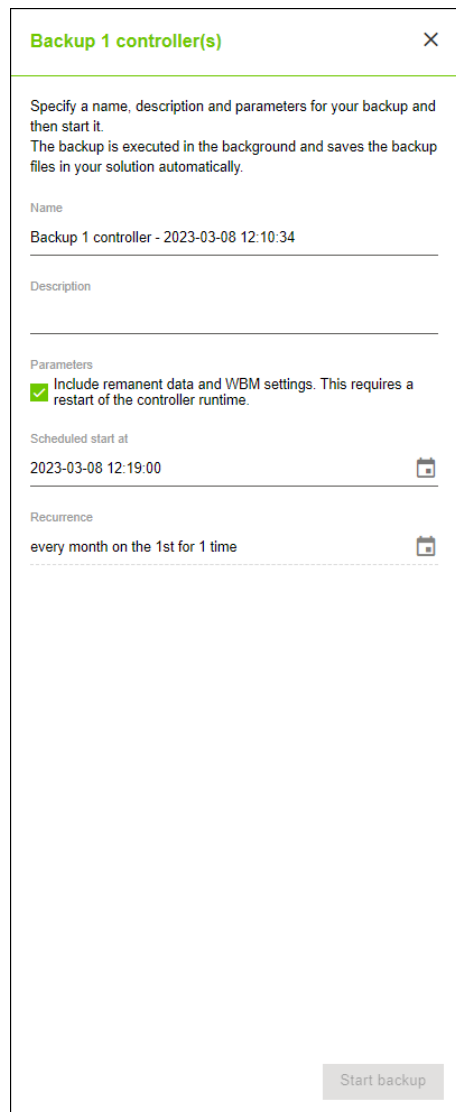


Figure 92: Side Menu > "Network" Menu Item > "DEVICES" Tab > "Backup" Dialog

Table 36: Legend for Figure "Side Menu > 'Network' Menu Item > 'DEVICES' Tab > 'Backup Dialog"

Designation	Description
Name	Name of the backup

Designation	Description
Description	Description of the backup
Parameters (Including Remanent Data and WBM Settings)	If the box is checked, remanent data and WBM settings are included in the backup. This requires a restart of the controller runtime.
Planned Start at	Starts the backup at a specified time (date and time).
Repeat	Repeats the backup according to a defined routine based on the calendar.

8.1.4.2.8.1.4 "Backup Manager" Dialog

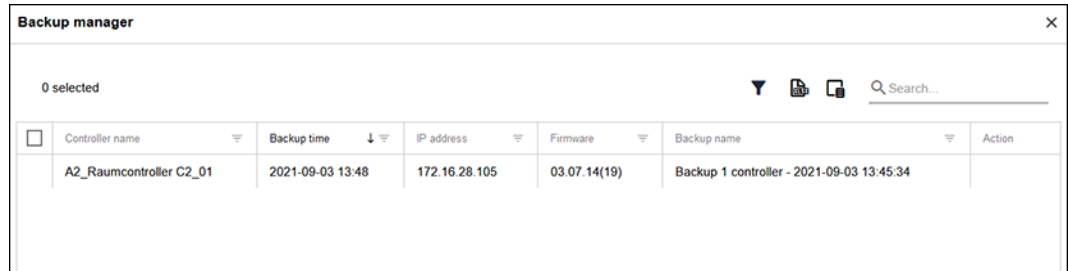


Figure 93: Side Menu > "Network" Menu Item > "DEVICES" Tab > "Backup Manager" Dialog

Table 37: Legend for Figure "Side Menu > 'Network' Menu Item > 'DEVICES' Tab > 'Backup Manager' Dialog"

Designation	Description
	Exports the list with backups as an Excel file.
Controller name	Name of the controller
Backup time	Time stamp of the backup
IP Address	IP address of the controller at the time of the backup.
Firmware	Firmware version of the controller at the time of the backup.
Backup name	Name of the backup. The backup description is displayed as a tooltip.
Action	Delete or download this backup from the solution.

8.1.4.2.8.2 "SCAN / IMPORT" Tab

The "SCAN / IMPORT" tab allows you to import a BACnet Configurator project file and search an existing IP network for new devices.

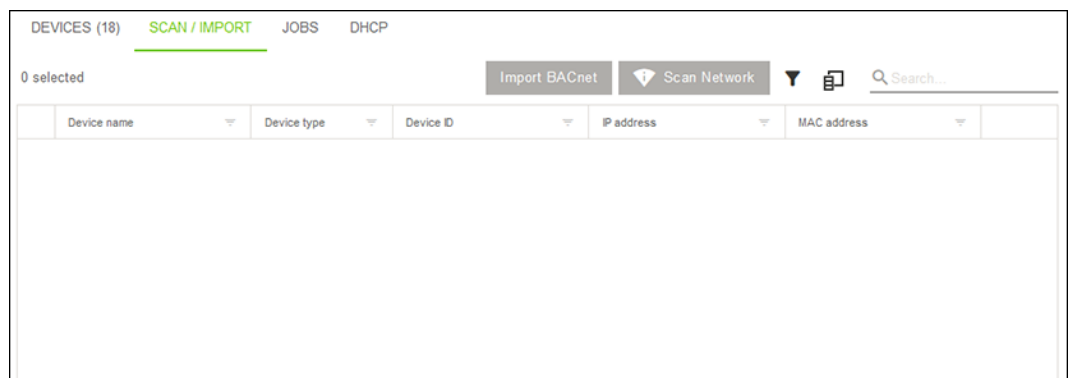


Figure 94: Side Menu > "Network" Menu Item > "SCAN / IMPORT" Tab

Designation	Description
[Import BACnet]	Imports a WAGO BACnet Configurator project file in *.wbc format. The project file may contain a scan or EDE import of a third-party BACnet device, for example. As a result, the BACnet device can be placed in the WAGO Solution Builder software's entity tree as a "third-party controller" and integrated into the cross-communication. For more information, see "Import BACnet Project" Dialog [p. 104] .
[Scan network]	Scans an existing IP network using a ping query or BACnet mechanisms. You can then select the device type, such as "Controller" or "Third-party controller" for the responding devices; the devices are then placed in the WAGO Solution Builder software's entity tree. For more information, see "Scan Network" Dialog [p. 105] .
Device name	Shows the hostname of a device.
Device Type	For selecting the device type to use in the WAGO Solution Builder software.
Device ID	Shows the BACnet device ID of a device. Note: Information only appears when a BACnet scan is performed!
IP address	Shows the IP address of a device.
MAC address	Shows the MAC address of a device. Note: If the IP communication needs to pass through an IP router on the way to the device, the MAC address shown here may differ from the actual device's MAC address.
Serial Number	Shows the serial number of a device.
Status	Indicates the status of a device.
Firmware Version	Shows the firmware version of a device. This field is filled in automatically when the network is scanned. Note: The field is only filled in automatically for devices that support WDA!
Item Number	Shows the item number of a device. This field is filled in automatically when the network is scanned. Note: The field is only filled in automatically for devices that support WDA!

8.1.4.2.8.2.1 "Import BACnet Project" Dialog

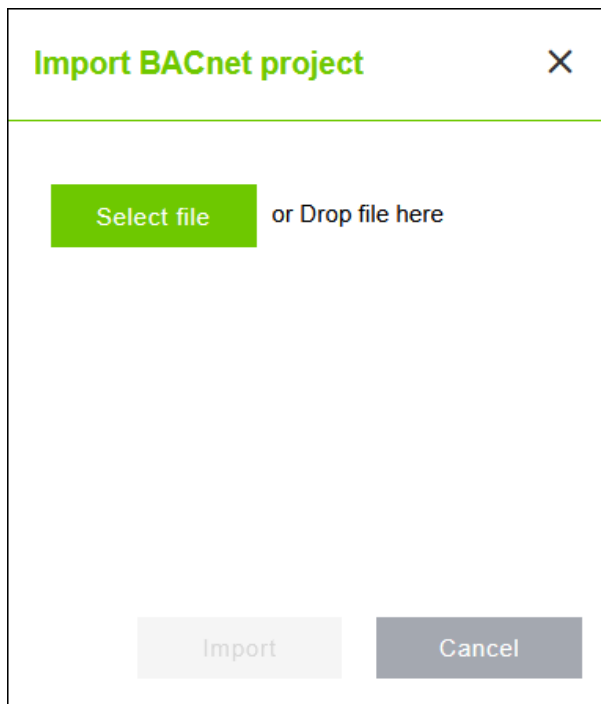


Figure 95: Side Menu > "Network" Menu Item > "SCAN / IMPORT" Tab > "Import BACnet Project" Dialog

Table 38: Legend for Figure "Side Menu > "Network" Menu Item > "SCAN / IMPORT" Tab > "Import BACnet Project" Dialog"

Designation	Description
[Select file] or drag to here	Adds a project file the conventional way via a file selection dialog or by dragging the export file into the box.

More information about importing a project file from the WAGO BACnet-Konfigurator is available in section [🔗 Importing a Project File from WAGO BACnet Configurator \[> 188 \]](#).

8.1.4.2.8.2.2 "Scan Network" Dialog

Figure 96: Side Menu > "Network" Menu Item > "SCAN / IMPORT" Tab > "Scan Network" Dialog

Designation	Description	
Scan IP address range (PING)	<input type="checkbox"/>	IP scan via ping is disabled.
	<input checked="" type="checkbox"/>	IP scan via ping is enabled.
	From IP address	Here you can specify the start address for scanning a network.
	To IP address	Here you can specify the end address up to which the network should be scanned.

Designation	Description	
		Maximum duration (seconds) Here you can specify the maximum permissible time for the device to respond to the ping.
Scan BACnet network (Who-Is)	<input type="checkbox"/>	BACnet scanning via "Who-Is Broadcast" is disabled.
	BACnet/SC	
	<input checked="" type="checkbox"/>	BACnet scanning via "Who-Is Broadcast" is enabled for BACnet/SC.
		BACnet/SC Node (Profile) Here you can select the profile of an existing BACnet/SC node.
	BACnet/IP	
	<input checked="" type="checkbox"/>	BACnet scanning via "Who-Is Broadcast" is enabled for BACnet/IP.
		BACnet network interface Here you can select the network interface to perform the BACnet scan on.
		BACnet port Here you can select the BACnet port to which the "Who-Is Broadcast" should be sent.
		Register as third-party device <input type="checkbox"/> The BACnet scan is not executed as a third-party device.
		<input checked="" type="checkbox"/> The BACnet scan is executed as a third-party device.
	IP address Here you can enter the IP address at which you want to register as a third-party device.	
	Port Here you can enter the BACnet port at which you want to register as a third-party device.	
	Registration interval Here you can enter the registration interval.	
Progress	Scan results list	
Scan in background (close this dialog)	<input type="checkbox"/>	The "Scan Network" dialog remains open during the scan. To complete the process, you then must transfer the scan results to the WAGO Solution Builder software's scan list manually.
	<input checked="" type="checkbox"/>	The "Scan Network" dialog closes during the scan. The scan results are then transferred to the WAGO Solution Builder software automatically.

8.1.4.2.8.3 "JOBS" Tab

All completed **Jobs** are managed on the "JOBS" tab.

The WAGO Solution Builder software and the controllers communicate asynchronously via jobs. These jobs are started by the user, then prepared by the WAGO Solution Builder software and transferred to the **WAGO Device Communication Service (DCS)** software. The **DCS** software handles the timing and parallel processing of the jobs on the controllers. A job can consist of a firmware update for multiple controllers, or synchronization of the complete configuration of a controller, for example.

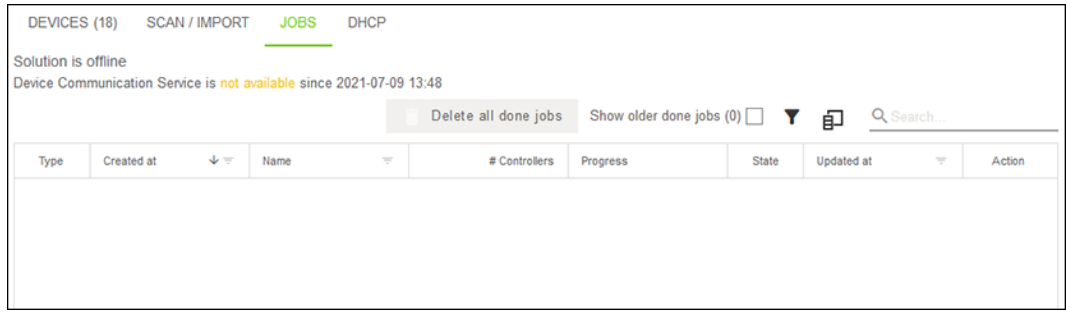


Figure 97: Side Menu > "Solutions" Menu Item > "Network" Menu Item > "JOBS" Tab

Designation	Description	
[Delete all completed jobs]	Clears the history of jobs that are already completed.	
[Show older completed jobs]	<input type="checkbox"/>	Does not show older jobs marked as "completed."
	<input checked="" type="checkbox"/>	Shows older jobs marked as "completed."
Type	Indicates the job type.	
Time created	Shows the timestamp for creation of a job.	
Name	Shows the job name.	
# of controllers	Shows the controllers involved in the job.	
Progress	Indicates the progress of the job processing, by counting the controllers that have been processed. <i>Example:</i> A job involving 10 controllers is 50 % complete once the job has finished on five controllers.	
Status	Indicates the job status. The possible states are: <ul style="list-style-type: none"> Running Planned Completed 	
Time of change	Shows the timestamp of the last activity within a job.	
Action	The following actions are available:	
		Deletes the job.

8.1.4.2.8.4 "DHCP" Tab

The "DHCP" tab is used for initial commissioning of controllers using the DHCP server.

In their factory default settings, WAGO controllers are set to "DHCP client," meaning they receive their IP address from a DHCP server. For initial device setup, the WAGO Solution Builder software provides a DHCP server. This server can be temporarily activated to make devices accessible and to carry out initial configuration.

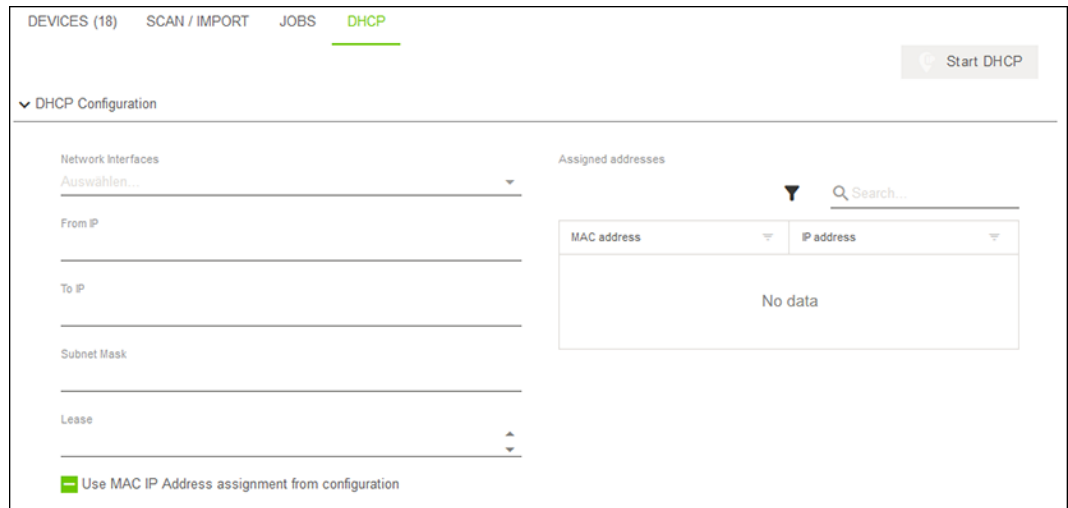


Figure 98: Side Menu > “Solutions” Menu Item > “Network” Menu Item > “DHCP” Tab

Designation	Description	
[Start DHCP] / [Stop DHCP]	Starts/stops the DHCP server after successful configuration.	
DHCP settings		
Network interfaces	Option for selecting one network interface among all of the system’s network interfaces. An interface for the DHCP server can be selected from a drop-down menu.	
From IP address	For entering the start of the IP address range for freely assigning IP addresses via DHCP.	
To IP address	For entering the end of the IP address range for freely assigning IP addresses via DHCP. Note: If all of the IP addresses in the address range have already been assigned by the DHCP server, the server rejects any further requests. The requesting devices can then no longer assigned IP addresses.	
Subnet mask	For entering the subnet mask that the target devices should use; this mask is communicated to the requesting devices along with the IP address.	
Lease	For entering the assigned IP addresses’ lease time. When this time expires, the devices request a new IP address from the DHCP server.	
Use MAC/IP address assignment from configuration	<input type="checkbox"/>	The DHCP server assigns IP addresses one by one in ascending order from the IP address range to any requesting devices.
	<input checked="" type="checkbox"/>	The DHCP server reserves IP addresses for all the devices configured in the WAGO Solution Builder software for which both an IP address and a MAC address have been set in the “Configuration” menu item on the “CONNECTION” tab. For more information, see the “CONNECTION” Tab [p. 64] . Note: The reserved IP addresses may, but do not have to, be located within the IP address range for the DHCP server. Reserved IP addresses outside this range are also assigned when this option is enabled.

Designation	Description				
Assigned IP addresses	<p>Lists all the devices that requested and were assigned an IP address via DHCP (as a "DHCP client"). The MAC address and IP address parameters are shown for these devices.</p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>Assigned addresses</p> <div style="text-align: right; margin-bottom: 5px;"> <input type="text" value="Search..."/> </div> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">MAC address</th> <th style="width: 50%;">IP address</th> </tr> </thead> <tbody> <tr> <td colspan="2" style="text-align: center; height: 40px;">No data</td> </tr> </tbody> </table> </div>	MAC address	IP address	No data	
MAC address	IP address				
No data					

8.1.4.2.8.5 "BACnet WATCHLIST" Tab

The "BACnet WATCHLIST" tab shows all the properties of the selected BACnet objects from the "Data Points" tab (see [🔗 "DATA POINTS" Tab \[p. 71\]](#)).

CONTROLLER (1) SCAN / IMPORT (1) JOBS DHCP <u>BACNET WATCHLIST</u>									
<input type="text" value="Search..."/>									
<input type="checkbox"/>	Controller Name	IP Address	Device ID	Object Type	Instance Number	Object Name	Property Name	Property Value (live)	Actions
<input type="checkbox"/>	Controller 1	172.16.27.136	2314	ANALOG_VALUE	0	myAnalogValue_0	Present Value		
<input checked="" type="checkbox"/>	Controller 1	172.16.27.136	2314	ANALOG_VALUE	1	myAnalogValue_1	Present Value		
<input type="checkbox"/>	Controller 1	172.16.27.136	2314	ANALOG_VALUE	2	myAnalogValue_2	Present Value		
<input type="checkbox"/>	Controller 1	172.16.27.136	2314	ANALOG_VALUE	3	myAnalogValue_3	Present Value		
<input checked="" type="checkbox"/>	Controller 1	172.16.27.136	2314	ANALOG_VALUE	4	myAnalogValue_4	Present Value		
<input type="checkbox"/>	Controller 1	172.16.27.136	2314	ANALOG_VALUE	5	myAnalogValue_5	Present Value		
<input type="checkbox"/>	Controller 1	172.16.27.136	2314	ANALOG_VALUE	6	myAnalogValue_6	Present Value		
<input type="checkbox"/>	Controller 1	172.16.27.136	2314	ANALOG_VALUE	7	myAnalogValue_7	Present Value		

Figure 99: Side Menu > "Solutions" Menu > "Network" Menu Item > "BACNET WATCHLIST" Tab

Designation	Description
	Starts cyclic querying of all BACnet objects and, the first time it is invoked, also opens the "BACnet Settings" dialog (see 🔗 "DATA POINTS" Tab [p. 71]). In this dialog, you can configure the BACnet settings in such a way that the current values for "Property Value" are read out live from the BACnet stack and shown in the Property Value (Live) column (see below) in the WAGO Solution Builder software.
	Stops cyclic querying of the BACnet objects; only visible if a query was started previously.
Controller Name	Name of controller
IP Address	IP address of controller
Device ID	"Device ID" per BACnet standard

Designation	Description
Object Type	"Object Type" per BACnet standard
Instance Number	"Object Instance" per BACnet standard
Object Name	"Object Name" per BACnet standard
Property Name	"Object Property" per BACnet standard
Property Value (Live)	The values for "Property Value" appear in this column live from the BACnet stack. Reading out the values requires the BACnet settings to be configured accordingly (see "DATA POINTS" Tab [▶ 71]).
Action	Deletes the selected "Property Value."

8.1.4.2.9 "Documentation" Menu Item

The "Documentation" menu item is used to create project documentation for a solution in PDF format. The area to be documented is indicated when an entity is selected. When an area is selected, the child elements below it are also selected. Besides the selection options offered under the "Documentation" menu item, attachments to or notes for an entity can also be included with the documentation. This allows you to include data sheets, circuit diagrams or instructions in the solution documentation, for example.

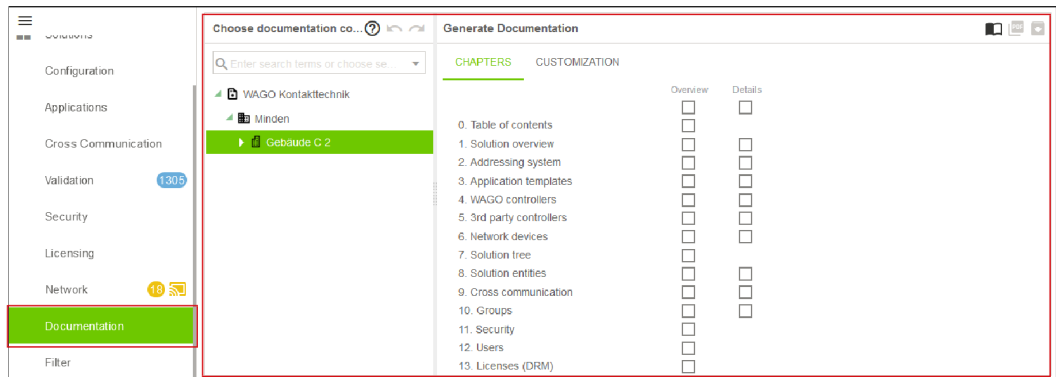


Figure 100: Side Menu > "Documentation" Menu Item

Table 39: Legend for Figure "Side Menu > "Documentation" Menu Item"

Symbol	Designation	Description
	Create	Starts the printing process for project documentation in PDF format. The documentation is prepared in the background without a progress bar.
	View project documentation	Shows the project documentation that has been prepared directly in the browser; it can be downloaded directly. Requirements: The project documentation must be created prior to this step using the [Create] button. Note: The project documentation may contain hyperlinks to additional documentation. To open these documents, you must first download the documentation package, unzip the .zip file and open the unzipped PDF.
	Download documentation package (ZIP)	Starts downloading a project package as a ZIP file. The project package contains the following: <ul style="list-style-type: none"> Project documentation in PDF format Optional documentation from the Application templates of IEC Development Environments. Entity attachments

8.1.4.2.9.1 "SECTION" Tab

The "SECTION" tab offers settings options to specify the content and level of detail for individual sections of project documentation. The sections can be documented in any combination. When the "Advanced" option is enabled, all the information available to the WAGO Solution Builder software is added to the corresponding section of the documentation with a high degree of detail.

CHAPTERS		CUSTOMIZATION	
	Basic	Extended	
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Table of contents	<input type="checkbox"/>		
Solution overview	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Addressing system	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Application templates	<input type="checkbox"/>	<input type="checkbox"/>	
WAGO controllers	<input type="checkbox"/>	<input type="checkbox"/>	
• Licenses	<input type="checkbox"/>		
3rd party controllers	<input type="checkbox"/>	<input type="checkbox"/>	
Network devices	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Network tree	<input type="checkbox"/>		
Entity descriptions, notes, attachments	<input checked="" type="checkbox"/>		
Cross communication	<input type="checkbox"/>	<input type="checkbox"/>	
Groups	<input type="checkbox"/>	<input type="checkbox"/>	
Security	<input type="checkbox"/>		
Users	<input type="checkbox"/>		

Figure 101: Side Menu > "Solutions" Menu > "Documentation" Menu Item > "SECTION" Tab

Designation	Description
Basic	Adds basic information to the project documentation.
Advanced	Adds the complete information to the project documentation.

8.1.4.2.9.2 "CUSTOMIZE" Tab

The "CUSTOMIZE" tab offers options for entering general document properties for generating solution documentation, including title, version, footer, as well as an option for selecting title graphics or logo.

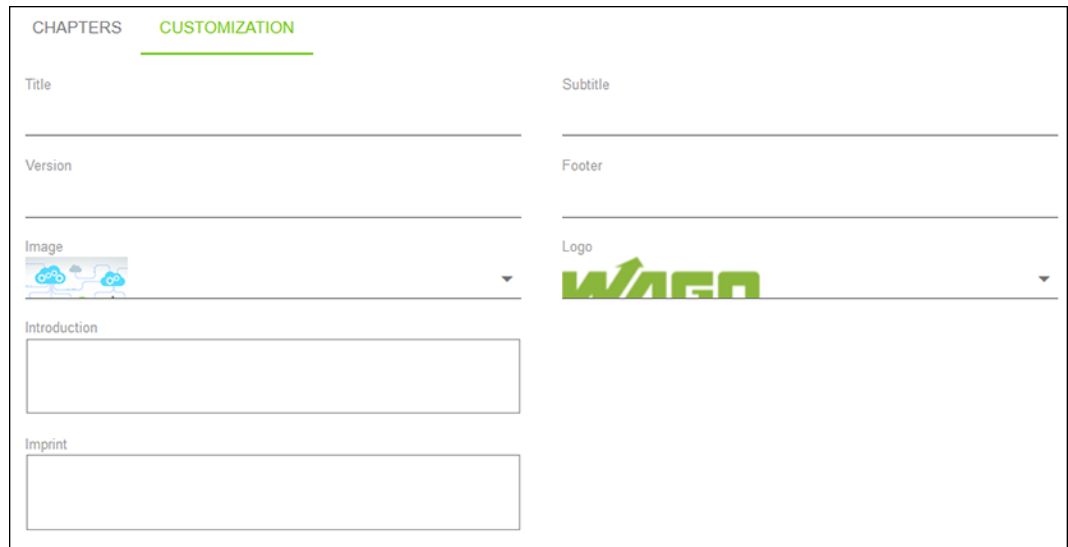


Figure 102: Side Menu > "Documentation" Menu Item > "CUSTOMIZE" Tab

Table 40: Legend for Figure "Side Menu > "Documentation" Menu Item" > "CUSTOMIZE" Tab"

Designation	Description
Title	Option for entering the title for the solution document
Version	Option for entering the version of the solution documentation
Image	Option for selection title graphics for the solution documentation Note: Graphics attachments uploaded in the main entity (first item in the entity tree) of a solution under menu item "Configuration" on the "ATTACHMENTS" tab can be selected here. You can find further information in "ATTACHMENTS" Tab [▶ 62] .
Introduction	Option for entering an introduction section for the solution documentation
Imprint	Option for entering a masthead for the solution documentation
Subtitle	Option for entering an additional subtitle for the solution documentation
Footer	Option for entering the content for the footer of the solution documentation
Logo	Option for selecting a logo for the solution documentation Note: Graphics attachments uploaded in the main entity (first item in the entity tree) of a solution under menu item "Configuration" on the "ATTACHMENTS" tab can be selected here. You can find further information in "ATTACHMENTS" Tab [▶ 62] .

8.1.4.2.10 "Filter" Menu Item

You can use the "Filter" menu item to search through the solution by applying different criteria and properties and to save filters in search configurations. Once they are saved, the filters are then available at all times in the entity tree, as well as for automatic assignment of controllers in groups (see ["GROUPS" Tab \[▶ 62\]](#)).

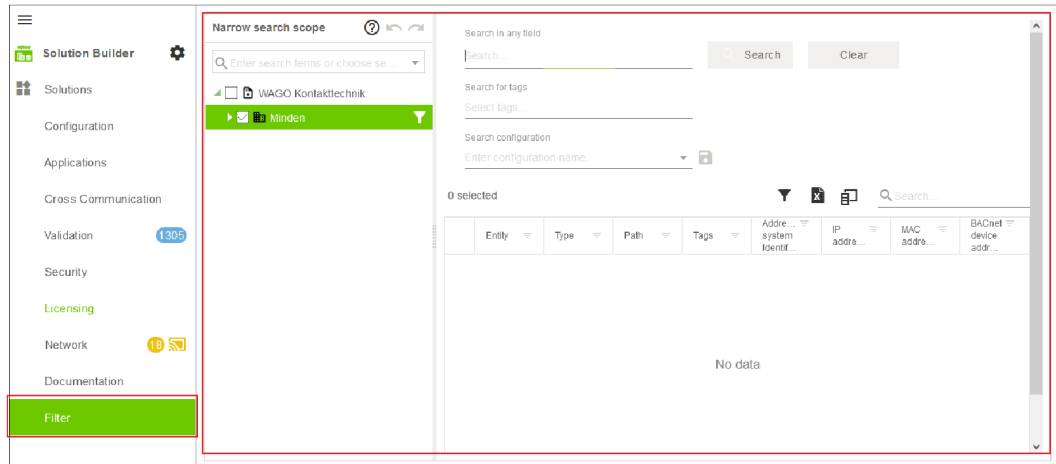


Figure 103: Side Menu > "Filter" Menu Item

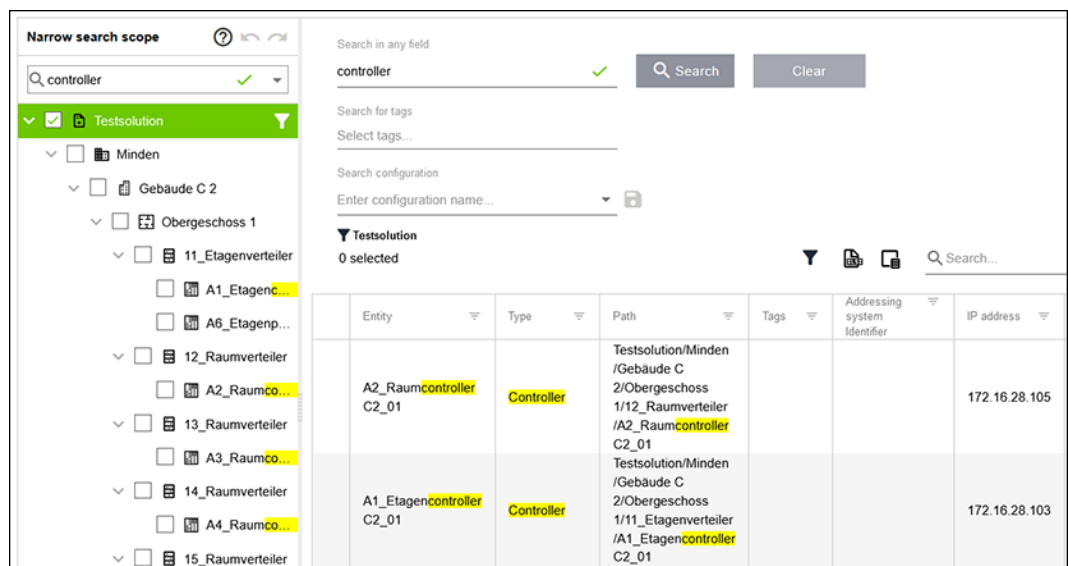



Figure 104: Side Menu > "Filter" Menu Item > Action Area > Search Results

Designation	Description
[Search]	Starts a search.
[Delete]	Clears the search entries and results from the search dialog.
Search in all fields	Full text search can be used to search all properties of the entities.
Search for tags	Search for one or more tags on entities.
Search configuration	Restrict the search area via the entity tree.
Limit search results	Enter the name and save the search configuration using the Save icon. From the drop-down menu, you can select any of the saved search configurations to open and activate them or delete them.
	Exports the search results to an *.xlsx file in the form of a table. Note: The exported table values for controllers can be processed and re-imported. This makes it easier to assign unique values, including target settings for IP addresses, MAC addresses, controller names and BACnet device IDs.

8.1.4.2.11 "Tasks" Menu Item

The "Tasks" menu item lists all notes (see ["NOTES" Tab \[p. 61\]](#)) that have been assigned the status "Task." To provide a comprehensive overview, all the listed tasks can be sorted and filtered by different criteria. Tasks can also be given due dates and assigned to specific users. All tasks can also be exported.

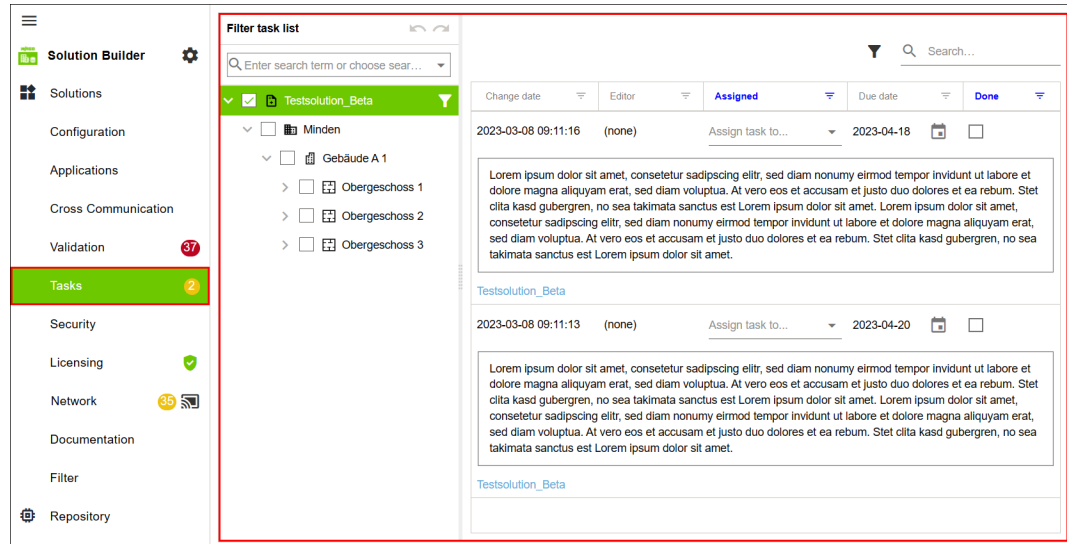


Figure 105: Side Menu > "Tasks" Menu Item

Designation	Description
Changed on	Sorts the listed tasks by creation date.
Author	Sorts the listed tasks by author.
Assigned	Sorts the listed tasks by the assigned agent. The agent can be selected from the "Assign task" drop-down menu.
Due date	Sorts the listed tasks by due date. The due date can be selected from the "Calendar" drop-down menu.
Completed	Sorts the listed tasks by the "Completed" status. The "Completed" status can be selected with the corresponding checkbox.

8.1.4.3 "Repository" Menu

The **Repository** menu manages all the software versions available for the WAGO Solution Builder software. These include the controller firmware, for example.

8.1.4.3.1 "FIRMWARE" Tab

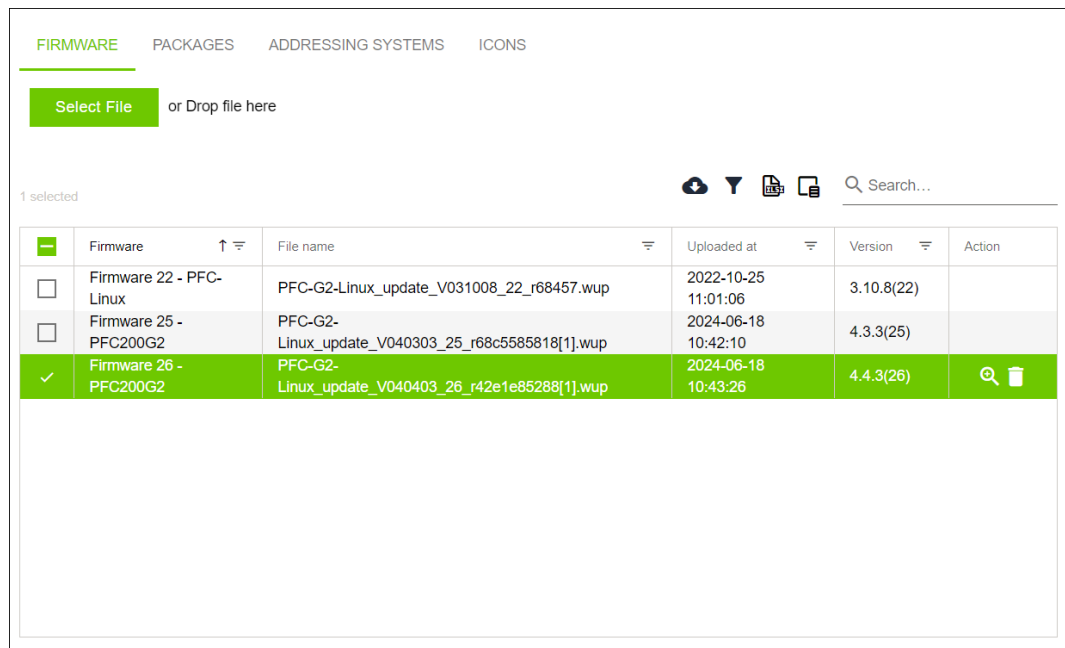


Figure 106: Side Menu > Repository > "FIRMWARE" Tab

Designation	Description
[Select file] or drag here	Allows you to add an export file using a standard file selection dialog or by dragging the export file into the field.
	Downloads the latest firmware version from the WAGO Download Center .
	Exports the firmware list as an Excel file.
Firmware	Shows the firmware name/description.
Filename	Shows the firmware filename.
Uploaded on	Shows the date the firmware was uploaded to the WAGO Solution Builder software.
Version	Indicates the firmware version.
Action	The following actions are available: <ul style="list-style-type: none"> Delete the firmware from the WAGO Solution Builder software.

An explanation of the other symbols can be found in [General Operating Elements and Icons \[p. 42\]](#).

8.1.4.3.2 "ADDRESSING SYSTEMS" Tab

Each solution has a structure that follows a fixed set of rules. This set of rules is called the "addressing system." Different addressing systems can be accessed via the "ADDRESSING SYSTEMS" tab.

Various addressing systems come included with the WAGO Solution Builder software. From these existing addressing systems, you can derive customer-specific addressing systems that you can configure individually to meet specific project requirements.

Note

Structure changes affect only the representation and arrangement!

The structure of an addressing system only describes the representation in the graphical user interface. Therefore, any changes made to the structure only affect the arrangement or representation of the selected function in the WAGO Solution Builder software! The function itself cannot be modified, influenced or configured on a technical level!

Structure Editor

In the WAGO Solution Builder software, the built-in structure editor is used to define and configure the structure of an addressing system. The structure editor opens automatically as soon as an existing addressing system is selected. The functions of the structure editor are described in detail in [Structure Editor \[► 117\]](#).

Tab

The tab has the following structure:

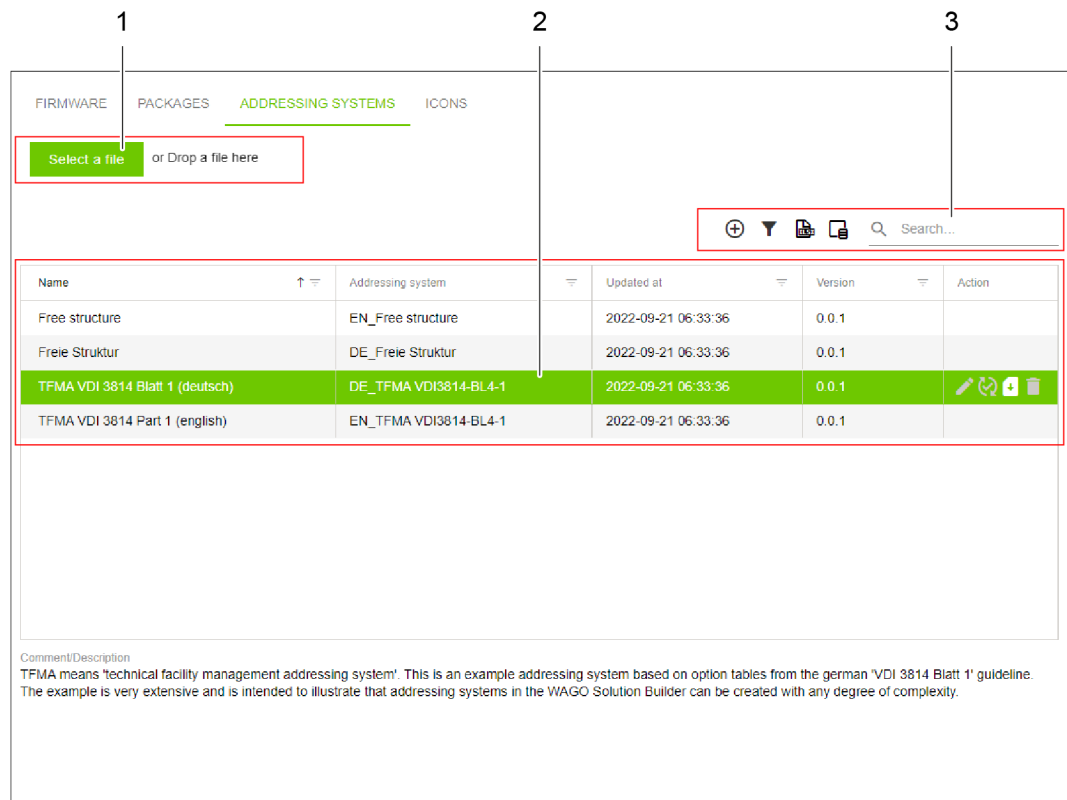


Figure 107: Side Menu > Repository > "ADDRESSING SYSTEMS" Tab

Position	Name
1	<p>Import</p> <p>Here you can import an existing addressing system. The following file formats are supported: SBSB and XML.</p> <p>For additional information about the structured "Solution Builder Structure Definition" (sbsd) file, see SBSB File.</p>

Position	Name
2	<p>“Addressing systems” area</p> <p>This shows all the available addressing systems in tabular form. Each addressing system can be opened and edited in the editor with mouse clicks. Customer-specific addressing systems are marked with a prefixed “+.”</p> <p>For more information, see 🔗 Structure Editor [▶ 117].</p>
3	<p>Buttons</p> <p>For more information, see 🔗 General Operating Elements and Icons [▶ 42].</p>

In the following example, we use the editor to edit the “DE_TFMA VDI3814-BL4-1” addressing system, which comes included.

8.1.4.3.2.1 Structure Editor

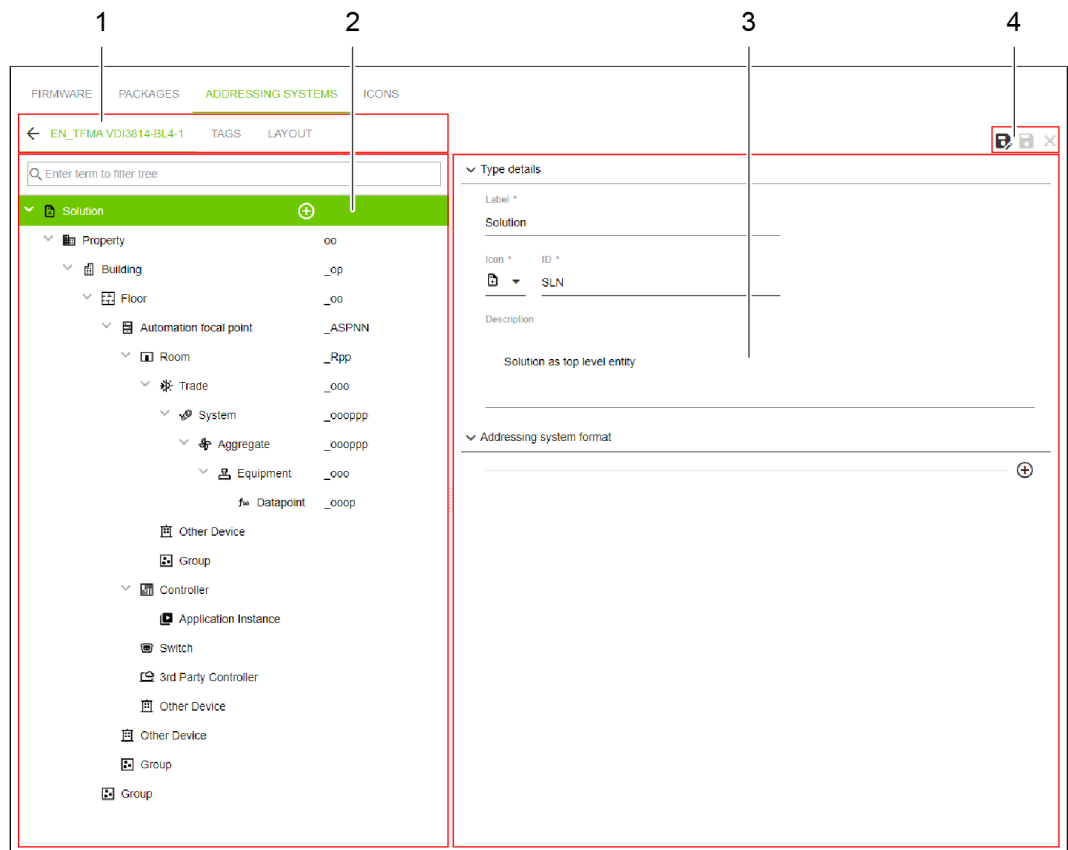


Figure 108: Side Menu > Repository > “ADDRESSING SYSTEMS” Tab > Structure Editor

Table 41: Legend for Figure “Side Menu > Repository > ‘ADDRESSING SYSTEMS’ Tab > Structure Editor”

Position	Name
1	<p>Sub-tabs</p> <p>The lower-level tabs are listed here. The first tab is not rigidly defined and can be named according to the initial selection:</p> <ul style="list-style-type: none"> • An existing addressing system has been selected: The tab bears the name of the selected addressing system. • An addressing system that does not yet exist is to be created: The tab bears the name “NEW”.
2	<p>Entity type tree (tree structure)</p> <p>This shows the addressing system in a tree structure. In the tree structure, all entities are structured hierarchically. For general information about entities, see section Entity Tree.</p> <p>For more information, see 🔗 Entity Type Tree [▶ 118].</p>

Position	Name
3	<p>Action area</p> <p>Here you can edit the properties for the selected entity and the format of the addressing system. Only one entity can be selected; bulk processing is not possible. All changes you make are applied automatically. The [Save] button saves the entire addressing system, including the changes you have made.</p> <p>For more information, see Entity Properties [> 120].</p>
4	<p>Buttons</p> <p>You can find more information on the buttons in section General Operating Elements and Icons [> 42].</p>

8.1.4.3.2.1.1 Entity Type Tree

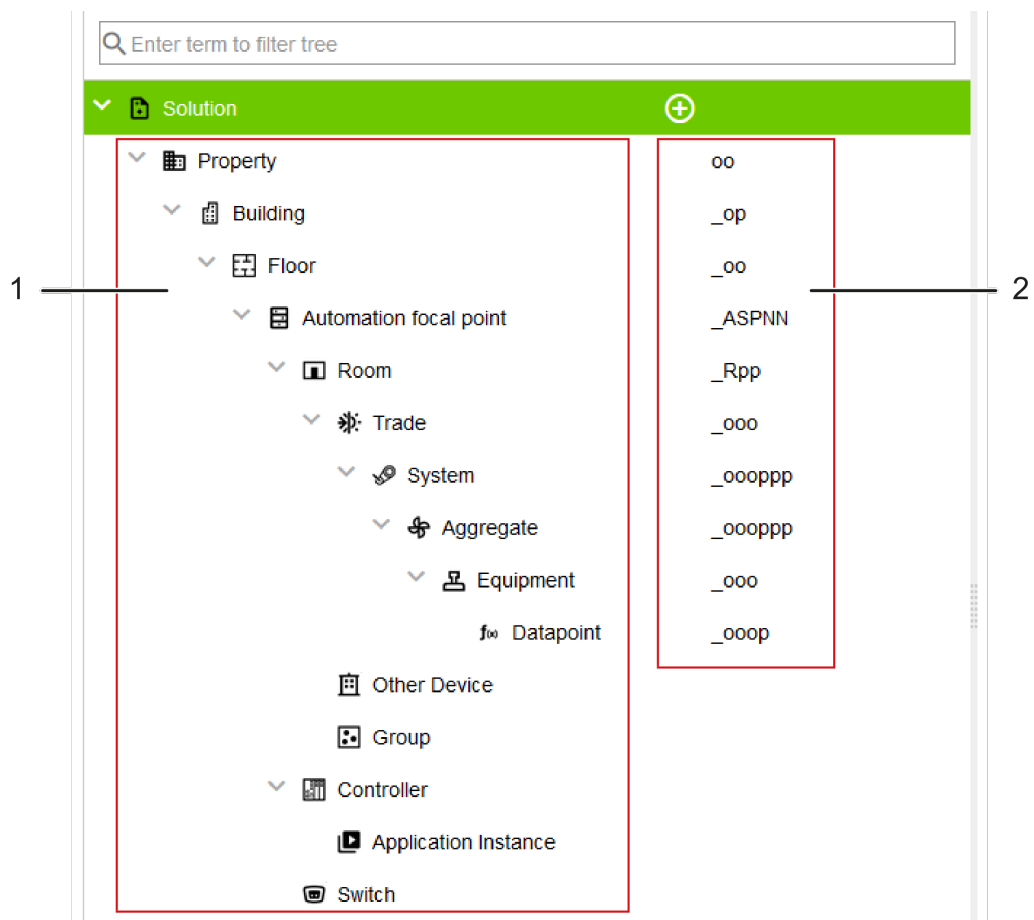

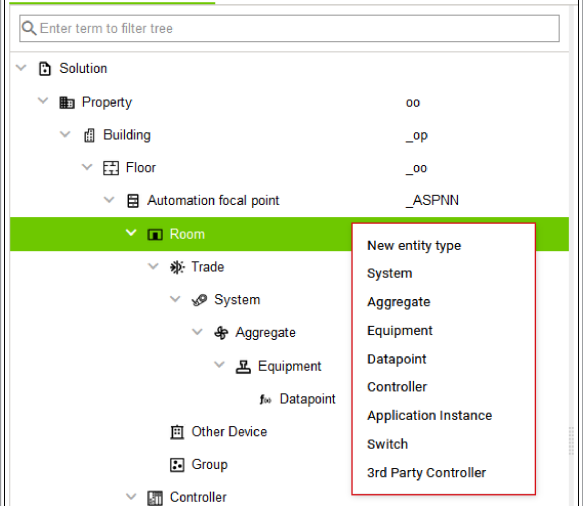

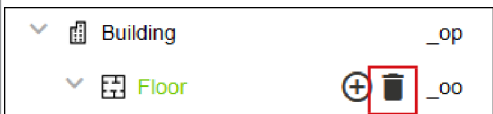


Figure 109: Entity Type Tree

Table 42: Legend for Figure "Header Bar"

Position	Designation	Description
1	Entity types	Shows the tree structure of all entity types in the addressing system. The icon and the entity type name are shown in the tree structure

Position	Designation	Description
	Add entity type	<p> Adds a new entity type to the tree structure below the current item.</p> <p>Clicking this icon opens a selection menu. The menu offers the option of creating a new entity type or reusing an existing entity type.</p> <p>The context menu offers the following selections:</p> <ul style="list-style-type: none"> • New entity type • Selection of an existing entity type from the list for reuse 
	Delete entity type	<p> Deletes an existing entity type from the addressing system.</p> <p>The icon appears when the mouse cursor is positioned over the element to be deleted.</p> 
2	Format	<p>Shows the composite short form of the addressing system components of the entity type.</p> <p>You can find further information at 🔗 Formats [▶ 123].</p>

8.1.4.3.2.1.2 Entity Properties

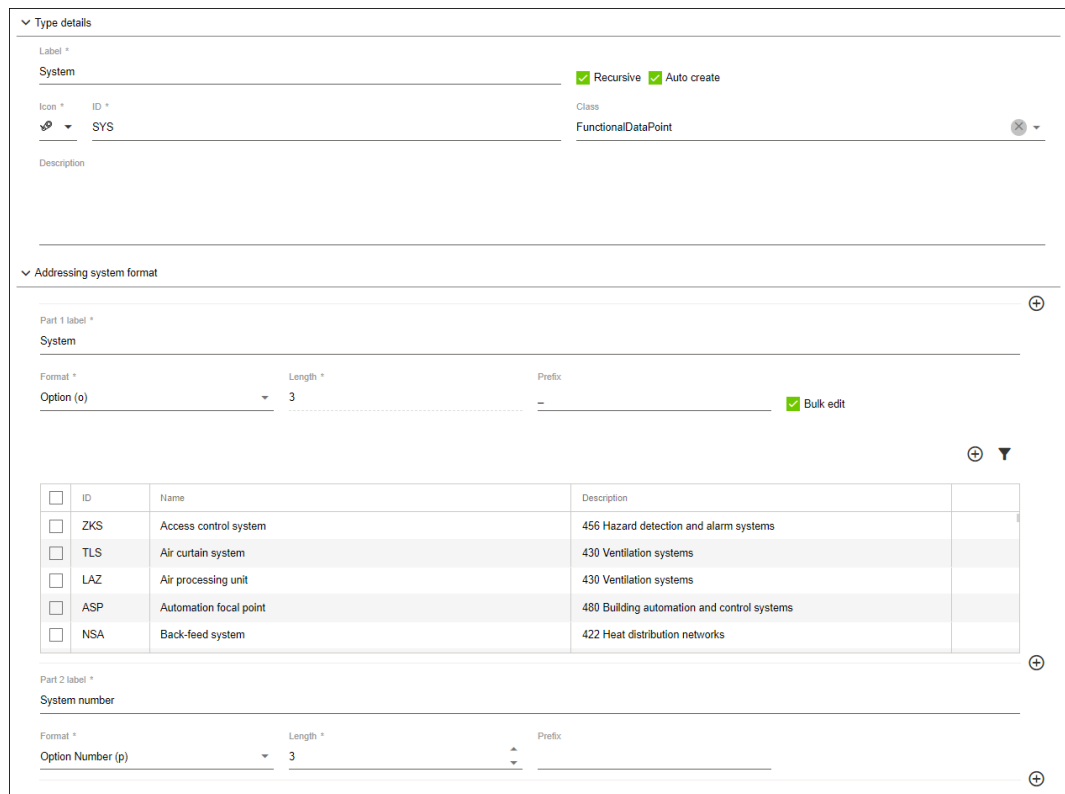


Figure 110: Structure Editor > Entity Properties > Area Overview

The representation of an entity in the WAGO Solution Builder software is freely configurable. In addition to selecting a custom icon, you can also configure the fields to display. The following list of entity properties provides an overview of the options for configuring an entity.

Changes to entity properties can be made in the following sub-areas:

- [🔗 "Type details" area \[▶ 122\]](#)
- [🔗 "Addressing System Format" Area \[▶ 122\]](#)
- [🔗 "Device management" area \[▶ 124\]](#) (only available for devices/controllers)

Table 43: Entity Properties

Designation	Description	
Label	Entity name	
Icon	Option for selecting the icon that will be displayed with the entity type label in the structure tree. You can choose icons from the system's standard catalog or custom icons from the user-specific catalog. For more information, see 🔗 "ICONS" Tab [▶ 128] .	
ID	ID of an entity type for unique internal identification; it is automatically preset by the system, but you can customize it if you prefer.	
Class	The "Class" property assigns a logic to an entity type. This ignores existing logics that are already present in the addressing system on the system side. Each class can be assigned to only one single type.	
	Group	For more information, see 🔗 Entity Classes [▶ 122] .
	OtherDevice	
	Switch	
	ThirdPartyController	
	ApplicationInstance	
	WagoController	

Designation	Description	
	SubBusDevice	
	FunctionalDataPoint	
Recursive	<input type="checkbox"/>	The entity cannot use itself as a sub-element.
	<input checked="" type="checkbox"/>	The entity can use itself as a sub-element.
Create automatically	<input type="checkbox"/>	When the higher-level entity is created, an entity of this type is not automatically created.
	<input checked="" type="checkbox"/>	When the higher-level entity is created, an entity of this type is automatically created.
Description	Note field for the administrator of the addressing system.	
Name of part x	The addressing system format (see ☞ "Addressing System Format" Area [> 122]) may consist of one or more parts. Here you can enter a name for the respective part.	
Format	A character of a format type represents a character in the addressing key.	
	Local Number	For more information, see ☞ Formats [> 123] .
	Global Number	
	Option	
	Option Number	
	Text	
Length	Length of the respective part of the addressing system.	
Prefix	Prefix of the part that precedes the addressing system in the global key.	
Bulk edit	<input type="checkbox"/>	The part of the addressing system cannot be modified if multiple entities are marked at the same time.
	<input checked="" type="checkbox"/>	The part of the addressing system can be modified if multiple entities are marked at the same time.
Addressing key description (long form of the addressing key)		
Position within the description	<p>Position of the selected entity under "Addressing key description" (see ☞ "ADDRESSING" Tab [> 57]).</p> <p>Example:</p> <p>An entity of type "Buildings" is selected in the tree structure. The value "1" is assigned to it at this point. Therefore, this entity is located under "Addressing Key Description" in position 1.</p> <div data-bbox="678 1361 1366 1464" data-label="Form"> </div> <p>Selection of position and description prefix</p> <div data-bbox="678 1525 1366 1809" data-label="Form"> </div> <p>Display on the "ADDRESSING" tab</p>	
Description prefix	<p>Character string preceding the addressing key description.</p> <p>Example:</p> <p>"Level" or "G/" or "in"</p>	
Description only (no key)	Displays only this parameter and hides the addressing key.	

An explanation of the other symbols can be found in [🔗 General Operating Elements and Icons \[> 42 \]](#).

8.1.4.3.2.1.2.1 “Type details” area

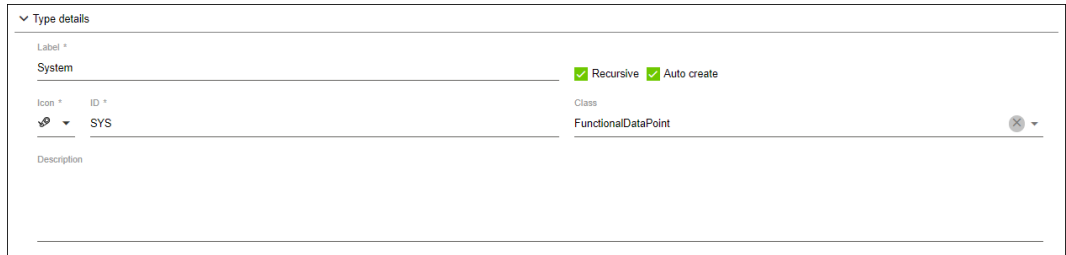


Figure 111: Side Menu > Repository > “ADDRESSING SYSTEMS” Tab > Editor > “Type Details” Area

For the description of each entity property, see [🔗 Entity Properties \[> 120 \]](#).

8.1.4.3.2.1.2.1.1 Entity Classes

The following optional entity classes are available:

Table 44: Entity Classes

Class	Description
WagoController	The “WagoController” class identifies an entity as a full-fledged WAGO controller. An application can be assigned. The full range of functions is available.
ThirdPartyController	The “ThirdPartyController” class represents a controller from a third-party manufacturer to which a communication connection can be established via a WAGO controller. “ThirdPartyControllers” cannot be synchronized with WAGO controllers.
OtherDevice	The “OtherDevice” class represents any network device that is neither a “WAGOCcontroller” nor a “ThirdPartyController.” For these devices, you can configure a network connection, as well as Web-Based Management if it is present.
Switch	The “Switch” class is functionally identical to the “OtherDevice” class. However, it may have a different icon.
ApplicationInstance	The “ApplicationInstance” class is an instance that is always located under a WAGO controller. This instance cannot be moved and is subject to further application-specific rules.
FunctionalDataPoint	The “FunctionalDataPoint” class is used for functional data structures. This may represent a single measured value, for example.
SubBusDevice	The “SubBusDevice” class is used for functional data structures. This may represent an assembly, for example.
Group	With the “Group” class, the group members are shown as sub-entities in the structure of the solution. All the functions described apply to this class.

8.1.4.3.2.1.2.2 “Addressing System Format” Area

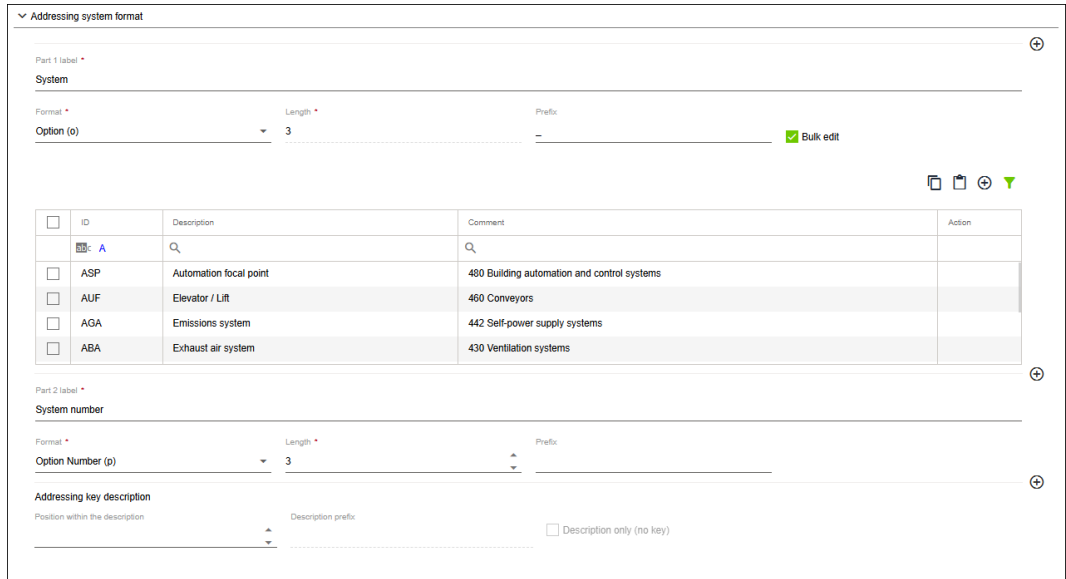


Figure 112: Side Menu > Repository > "ADDRESSING SYSTEMS" Tab > Editor > "Addressing System Format" Area

For the description of each entity property, see [Entity Properties \[> 120 \]](#).

8.1.4.3.2.1.2.2.1 Formats

The following formats are available for selection for each entity type in the "Addressing system format" area:

Table 45: "Addressing System Format" Area > Format

Format	Description
Global Number	An automatically preassigned number that is unique to the entity type within the solution.
Local Number	An automatically preassigned number that is unique to the entity type within the higher-level entity.
Option	A selection of predefined options that are output in the addressing key with the defined ID. With this format, a table appears for managing the options.
Option Number	An automatically preassigned number that is unique to the entity type within the higher-level entity and the selected option.
Text	Free text consisting of any characters, limited to the specified maximum length.

8.1.4.3.2.1.2.2.2 Options Table

If the "Option" format is selected in the "Addressing system format" area, an options table appears.

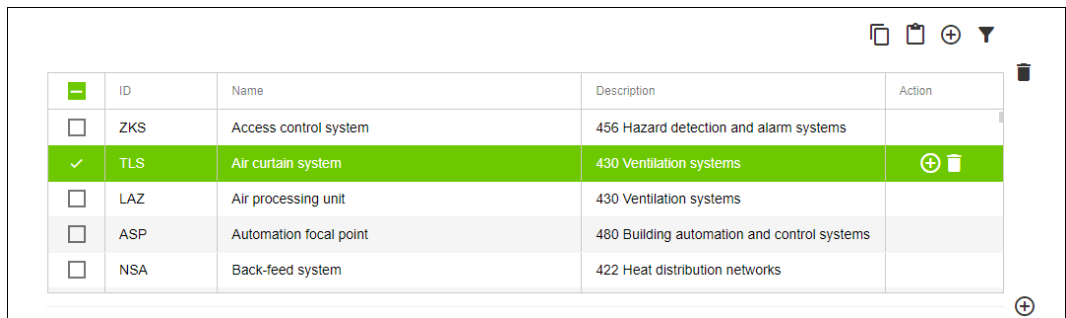


Figure 113: "Addressing System Format" Area > Options Table

Table 46: Legend for Figure "'Addressing System Format' Area > Options Table"

Designation	Description
<i>Selection column</i>	The table header indicates whether at least one row is selected in the options table and provides the following options.
	<input type="checkbox"/> No selection has been marked in the column.
	<input checked="" type="checkbox"/> At least one selection has been marked in the column.
	<input type="checkbox"/> Clears all selections from the column.
ID	Shows the ID of the option used in the addressing key.
Name	Shows the name of the option that is displayed in the selection list in the addressing area of an entity.
Description	Shows an internal note on the option. This note appears only at this point.

An explanation of the other symbols can be found in [General Operating Elements and Icons \[> 42\]](#).

Option tables (see [Options Table \[> 123\]](#)) or tags (see ["TAGS" Sub-Tab \[> 125\]](#)) can be copied via the clipboard, edited outside the program and re-added. You can find more information about this in Section [Editing Options Tables or Tags Externally \[> 192\]](#).

8.1.4.3.2.1.2.3

"Device management" area

The "Device management" area appears only for entity classes that represent a network device with an IP address and have device management. This area appears for the following entity classes:

- WagoController
- ThirdPartyController
- OtherDevice
- Switch

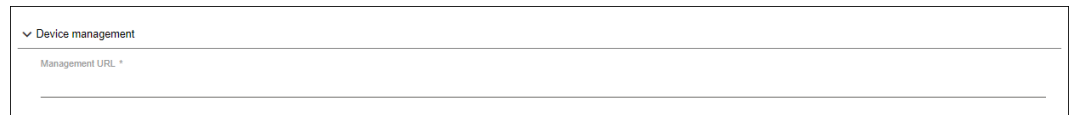


Figure 114: Side Menu > Repository > "ADDRESSING SYSTEMS" Tab > Editor > "Device Management" Area

For the description of each entity property, see [Entity Properties \[> 120\]](#).

8.1.4.3.2.1.2.4

Properties When Creating an Entity Type

Entity Properties When Selecting the "New Entity Type" Option

Selecting the "New entity type" option creates a new entry in the entity type tree. The entity properties of the newly created entity type are empty and must be completely configured from scratch.

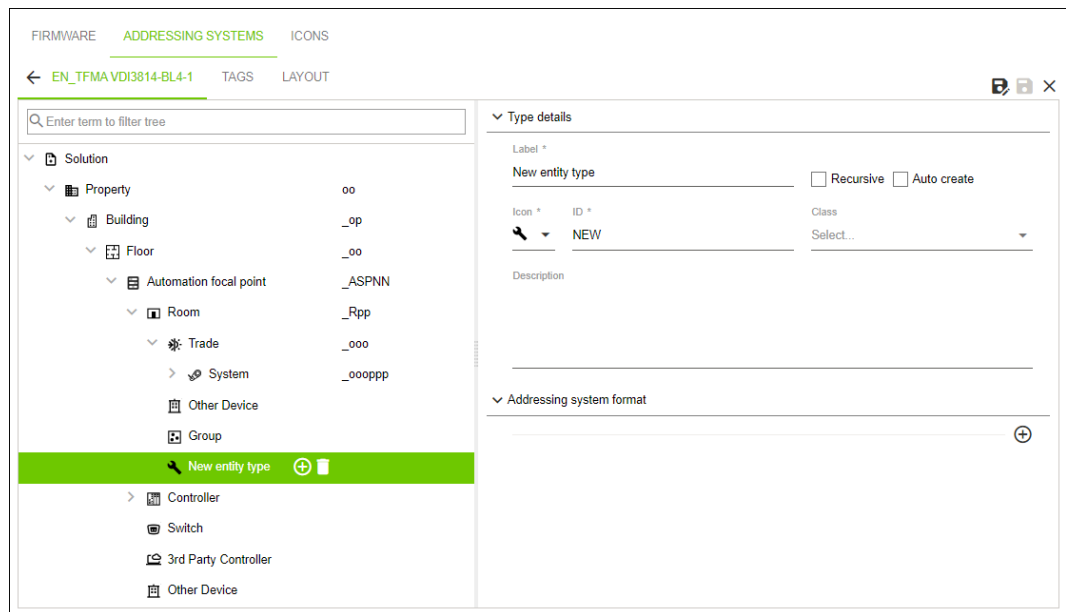


Figure 115: Entity Properties after a New Entity Type is Created

Entity Properties When Selecting from Existing Entity Types

Note

Multiple use of entity types is possible!

Entity types can also be used multiple times in the tree structure. If they are, then, once an existing entity type is created again in the tree structure, the existing entity type and the duplicated entity type are linked. All the settings are then synchronized. This means for example that a parameter change in the existing entity type will also affect the duplicate entity type. The newly created entity type thus references the existing entity type.

Note

Referenced entity types are always displayed without child elements!

If an existing entity type with lower-level child elements is used multiple times in the tree structure, the referenced entity type is shown without child elements. The child elements are still present, but are hidden for clarity!

8.1.4.3.2.1.3 "TAGS" Sub-Tab

On the "TAGS" sub-tab, you can define the tags that are present in the addressing system as you like.

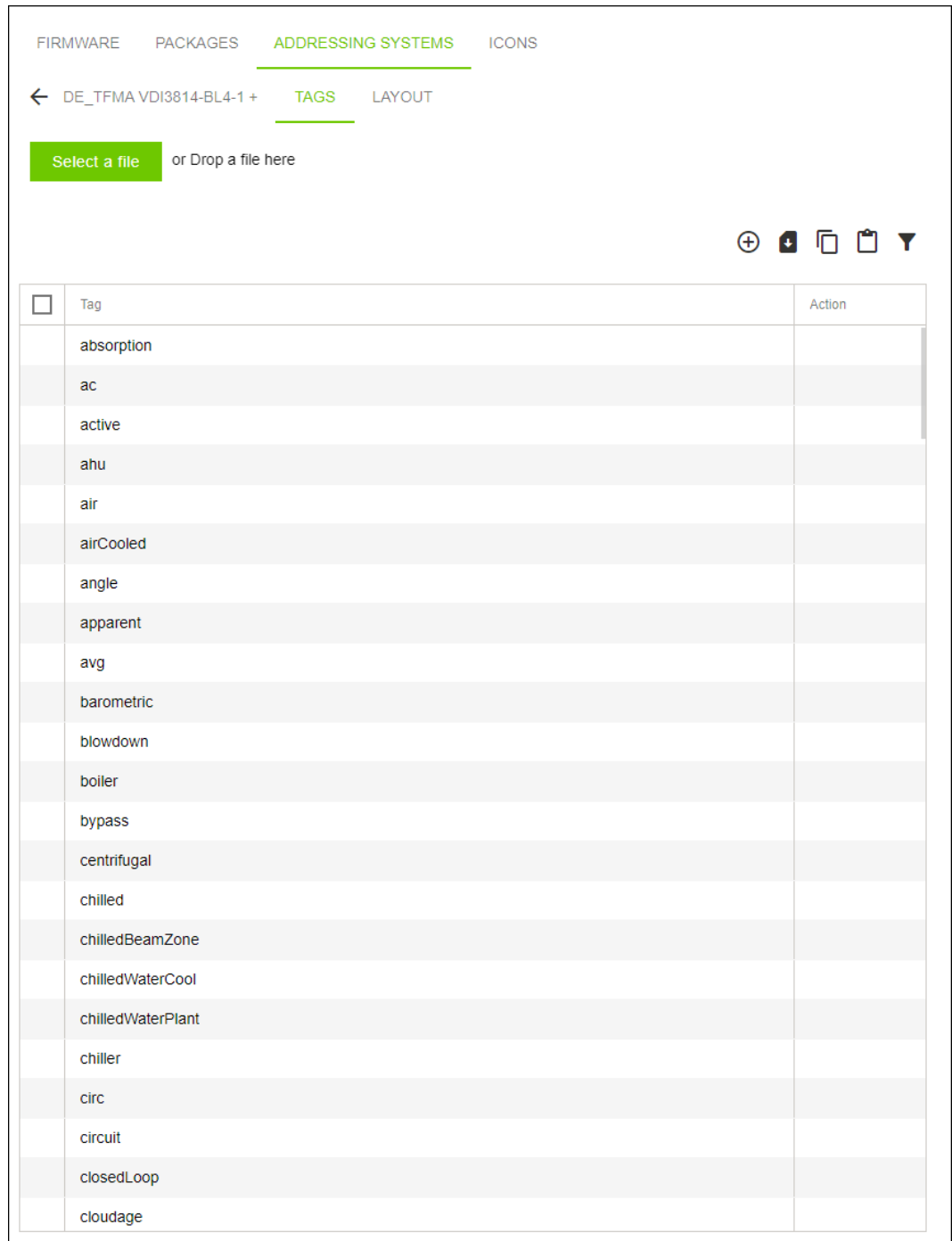


Figure 116: Structure Editor > "TAGS" Sub-Tab

Table 47: Legend for Figure "Structure Editor > "TAGS" Sub-Tab"

Designation	Description
<i>Selection column</i>	The table header indicates whether at least one row is selected in the options table and provides the following options.
<input type="checkbox"/>	No selection has been marked in the column.
<input checked="" type="checkbox"/>	At least one selection has been marked in the column.
Day	Shows the tag name.
Action	Creates an additional tag (below the selected tag) or deletes the selected tag.

An explanation of the other symbols can be found in [🔗 General Operating Elements and Icons \[p. 42\]](#).

Option tables (see [Options Table \[> 123\]](#)) or tags (see ["TAGS" Sub-Tab \[> 125\]](#)) can be copied via the clipboard, edited outside the program and re-added. You can find more information about this in Section [Editing Options Tables or Tags Externally \[> 192\]](#).

8.1.4.3.2.1.4 "LAYOUT" Sub-Tab

On the "LAYOUT" sub-tab, you can customize the layout for the property editor of the configuration page. As a general rule, the editor view in the configuration (see also ["Configuration" Menu Item \[> 57\]](#)) consists of **aspects**.

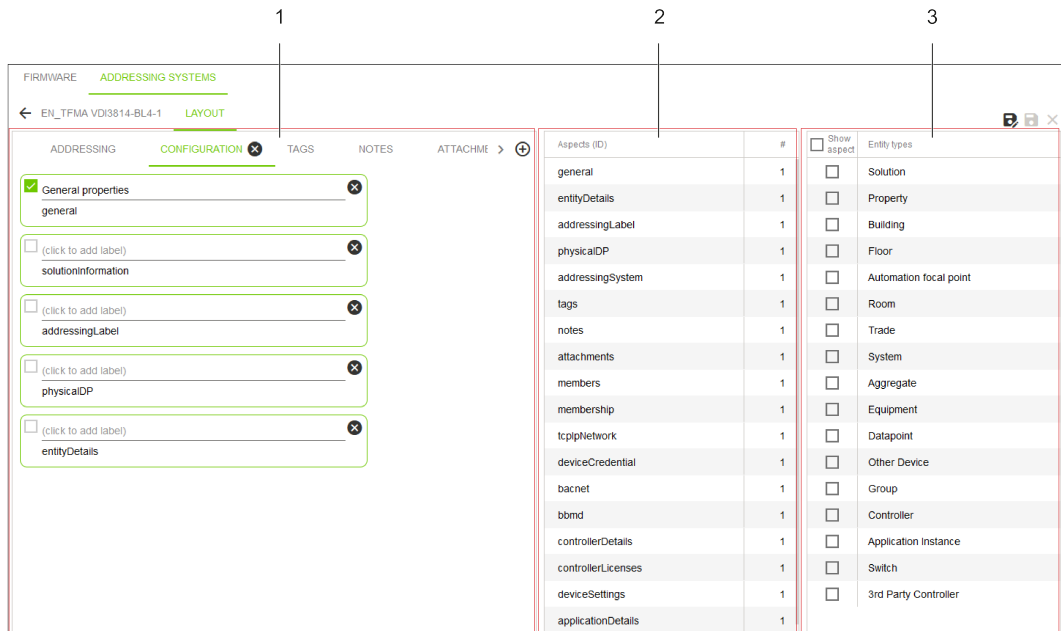


Figure 117: Structure Editor > "LAYOUT" Sub-Tab

Position	Designation	Description
1	LAYOUT Tabs	Shows individual tabs with aspects and their settings. An unlimited number of tabs can be created. Aspects from the "Aspects (ID)" column can be assigned to the tabs that are created.
2	Aspects (ID)	Shows all aspects available in the system. The following information is displayed: <ul style="list-style-type: none"> Aspects (ID) # The "#" column indicates the frequency of aspect usage on the LAYOUT tabs. The aspects are displayed in the order corresponding to the configuration and are predefined by the system. For each aspect, a heading can be assigned and the "Collapse Aspect" option can be activated. The option of collapsing the aspects allows you to assign all aspects to just one tab, or only one aspect per tab.
3	Entity types	Shows all entity types that have been created.

An explanation of the other symbols can be found in [General Operating Elements and Icons \[> 42\]](#).

8.1.4.3.3 "ICONS" Tab

Customer-specific icons can be managed in the "ICONS" tab. The icons can then be selected and used in the definition of an addressing system.

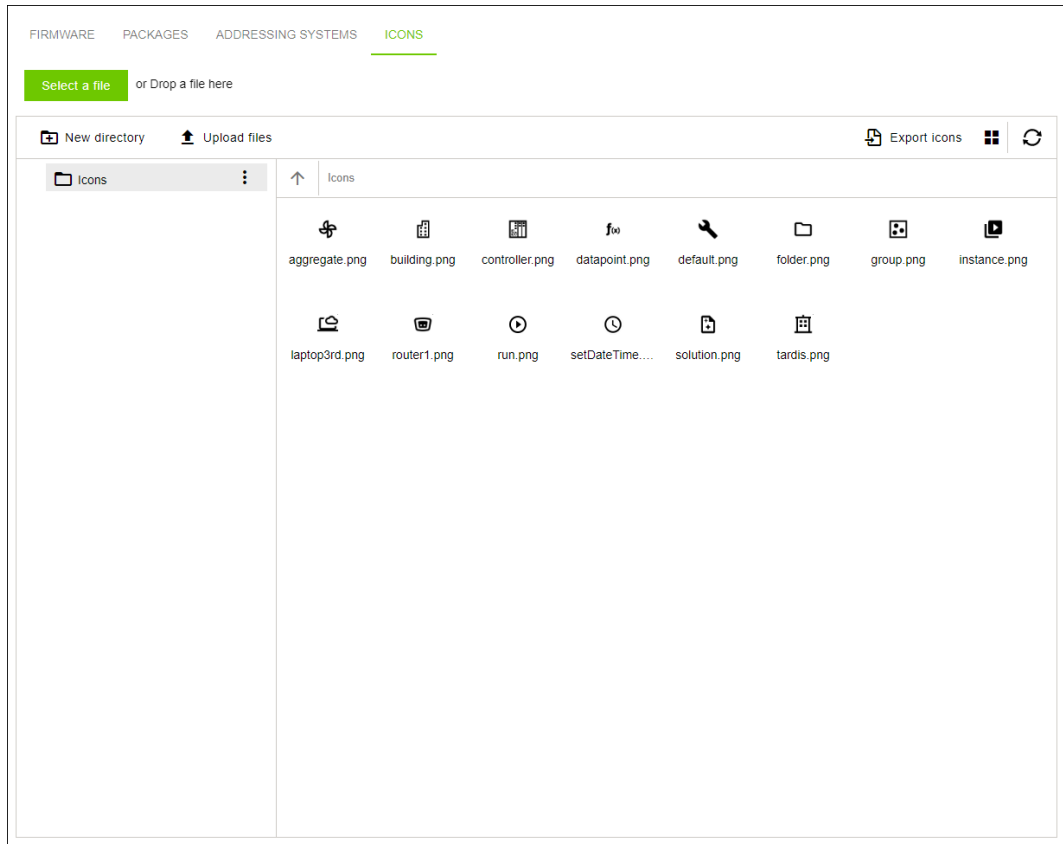


Figure 118: Structure Editor > "ICONS" Tab

Table 48: Structure Editor > "ICONS" Tab

Designation	Description
View without selected icons	
[Select file]	Imports existing icons from a structured sbicons file. You can find additional information about structured Solution Builder Icons (subicons) files under sbicons file .
[New directory]	Creates a new icon directory.
[Upload files]	Opens a dialog window for uploading new graphics for icons.
[Export icons]	Exports existing icons to a structured sbicons file. You can find additional information about structured Solution Builder Icons (subicons) files under sbicons file .
View with selected icons	
[Download]	Downloads the selected icon in the appropriate pixel format (e.g., png, jpg, etc.).
[Move to]	Moves the selected icon to a different directory.
[Copy to]	Copies the selected icon to a different directory.
[Rename]	Renames the selected icon.
[Delete]	Deletes the selected icon.
[Cancel selection]	Cancels the current selection.

8.1.4.3.3.1 Format Requirements for Icons

The icons used should have the following format properties:

Table 49: Format Requirements for Icons

Property	Value
File format	Possible file formats: <ul style="list-style-type: none"> ▪ *.jpg ▪ *.png ▪ *.jpeg
Icon size	32 px × 32 px Note: Icon of different sizes are automatically adjusted to the required size.

8.1.4.3.4 "PACKAGES" Tab

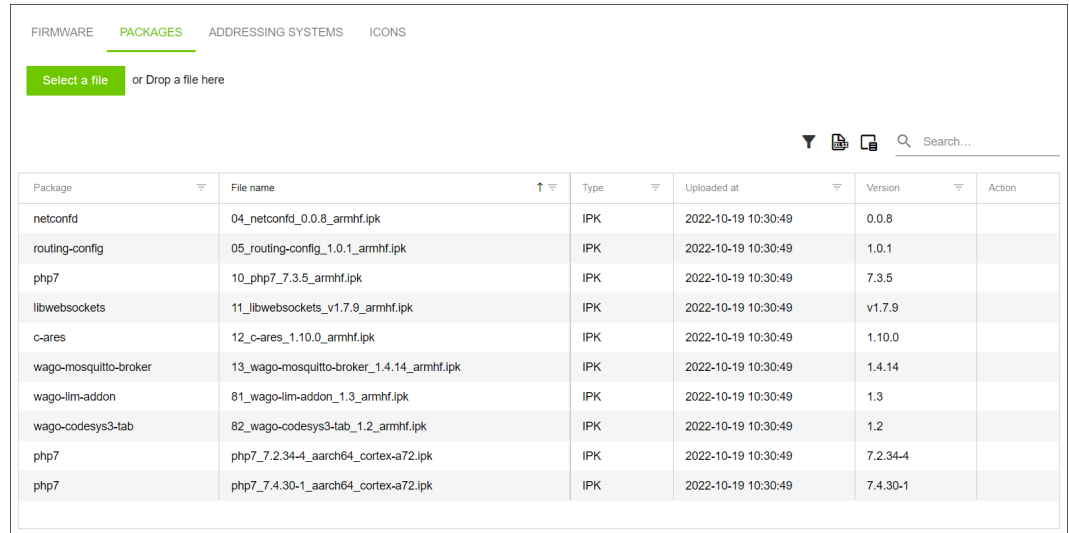


Figure 119: Side Menu > Repository > "PACKAGES" Tab

Designation	Description
[Select file] or drag here	Allows you to add an IPK package file using a standard file selection dialog or dragging the IPK package file into the field.
	Exports the package list as an Excel file.
Package	Shows the name of the IPK package.
Filename	Shows the filename of the IPK package.
Type	Shows the IPK package type.
Uploaded on	Indicates the date the IPK package was uploaded to the WAGO Solution Builder software.
Version	Shows the IPK package version.
Action	The following actions are available: <ul style="list-style-type: none"> ▪ Deletes the IPK package from the WAGO Solution Builder software.

8.2 WAGO Solution Builder Plug-in

8.2.1 CODESYS IEC Development Environment

The WAGO Solution Builder Plug-in software is an extension for **IEC development environments** and supports the creation of **application templates** for building automation applications. The created application templates are linked to devices in the WAGO Solution Builder software. Any number of application template instances can be created. The application template specifies the devices (item number), node setup and firmware to use.

The graphical user interface within the IEC Development Environment has the following structure.

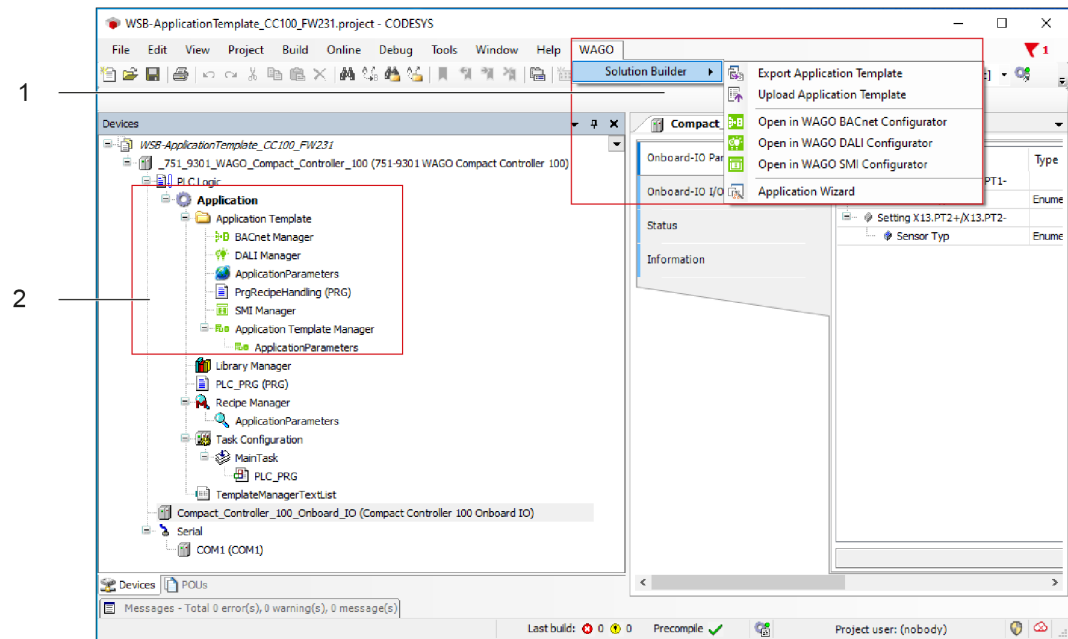


Figure 120: Structure of the Graphical User Interface – Main Areas (CODESYS)

Position	Designation	Description
1	Main menu	Contains the main buttons, e.g., for exporting a completed application template or calling up configurators.
2	“Manager” Objects	Manage the projects of the configurators within the program structure of development environments.

You can find more information in:

- [“WAGO” Main Menu \[► 130\]](#)
- [“Manager” Objects in the Program Structure \[► 135\]](#)

8.2.1.1 “WAGO” Main Menu

Note

Commands always refer to active application

The commands in the main menu always refer to the active application. An active application is always highlighted in bold in the structure tree.

The WAGO Solution Builder Plug-in software menu in CODESYS allows the individual configurators for BACnet, DALI and SMI to be opened in CODESYS mode. In addition, the application templates can be imported and exported.

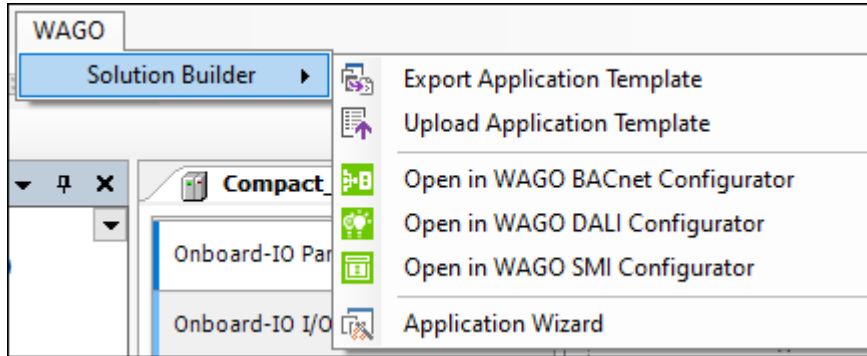

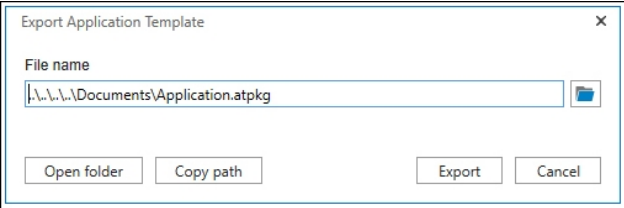

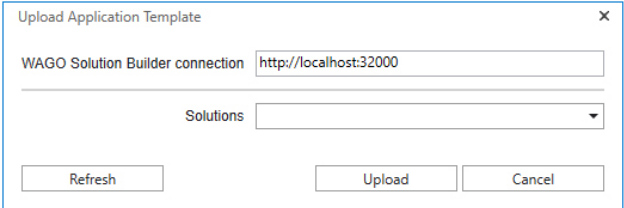






Figure 121: WAGO Solution Builder Plug-in Software CODESYS Menu

Icon	Designation	Description
	Export Application Template	<p>Opens the "Export Application Template" dialog for exporting the application template.</p>  <p>The application is exported as an *.atpkg file.</p>
	Upload Application Template	<p>Opens the "Upload Application Template" dialog for uploading an application template.</p>  <p>Under "Connection to WAGO Solution Builder," you must enter the URI (Uniform Resource Identifier) for the WAGO Solution Builder software. The URI is normally already specified.</p> <p>Clicking on the "Solutions" drop-down menu opens a list of all the solutions created in the WAGO Solution Builder software. Here you can directly select the target solution and upload the application template to the solution without having to use an export file.</p>
	Open in WAGO BACnet Configurator	<p>Opens the WAGO BACnet-Konfigurator software in development environment mode.</p> <p>The project selected in the associated "Manager" object opens in the configurator.</p> <p>If no project is selected, you are asked if you want to create a new project.</p>
	Open in WAGO DALI Configurator	<p>Opens the WAGO DALI Configurator software in development environment mode.</p> <p>The project selected in the associated "Manager" object opens in the configurator.</p> <p>If no project is selected, you are asked if you want to create a new project.</p>

Icon	Designation	Description
	Open in WAGO SMI Configurator	Opens the WAGO SMI Configurator software in development environment mode. The project selected in the associated "Manager" object opens in the configurator. If no project is selected, you are asked if you want to create a new project.
	Application Wizard	Opens the "Select Wizard" dialog. A list of installed wizards appears. Wizards help you create an application template from a new or existing application.

8.2.1.1.1 Application Wizard

Application wizards assist you in creating application templates from a new or existing application.

These wizards have a user interface that guides you through a number of configuration options you can enter; objects in the active application can then be created or modified from these. Thus an application wizard can generate an application or part of an application to meet the user's needs. Depending on the wizard you are using, you may be able to add certain functions, create the basis for an application or create a complete application.

8.2.1.1.1.1 Start Screen

The application wizard start view shows a list of available wizards.

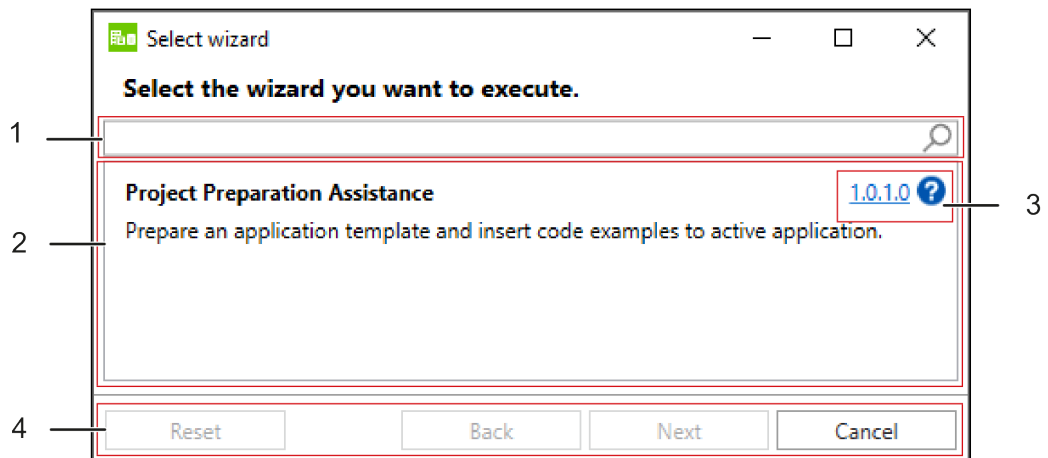



Figure 122: IEC Development Environment: Start View of the Application Wizard – "Select Wizard"

Position	Designation	Description
1	Search box	Searches the list of wizards for a search term. The wizard names and wizard descriptions are searched for the search term in the selected language and in the default language (English).
2	Wizard List	Shows all available wizards. Right-clicking on a wizard opens a context menu; see "Select Wizard" Contextual Menu [p. 133] below.
3	Help	 Opens the application notes for a wizard.

Position	Designation	Description
	Version and Release Notes	1.0.1.0 Shows the version of the wizard. You can open the release notes by clicking the version number.
4	[Reset]	Resets all settings that have been made.
	[Back]	Displays the previous dialog.
	[Next]	Displays the next dialog.
	[Cancel]	Cancels the operation.

8.2.1.1.1.1.1 “Select Wizard” Contextual Menu

Right-clicking on an Application Wizard in the “Select Wizard” dialog window opens the following contextual menu.

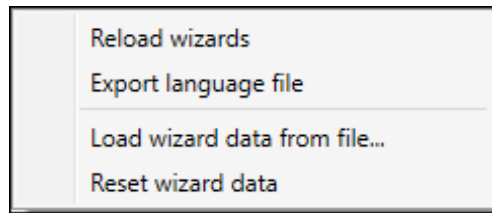


Figure 123: IEC Development Environment: Start View of the Application Wizard > “Select Wizard” Context Menu

Menu Item	Description
Reload Wizard	Reloads all application wizards. This can be useful for refreshing after changes, for example, or to update the version number after it has been re-imported.
Export Language File	Exports all the texts for the selected application wizard to a language file. The language file can then be translated into other languages so the application wizard can be used in different languages.
Load Data from File ...	Loads previously saved settings for the selected application wizard from a file.
Reset Data for This Wizard	Resets all settings that have been made for the selected application wizard.

8.2.1.1.1.2 Summary

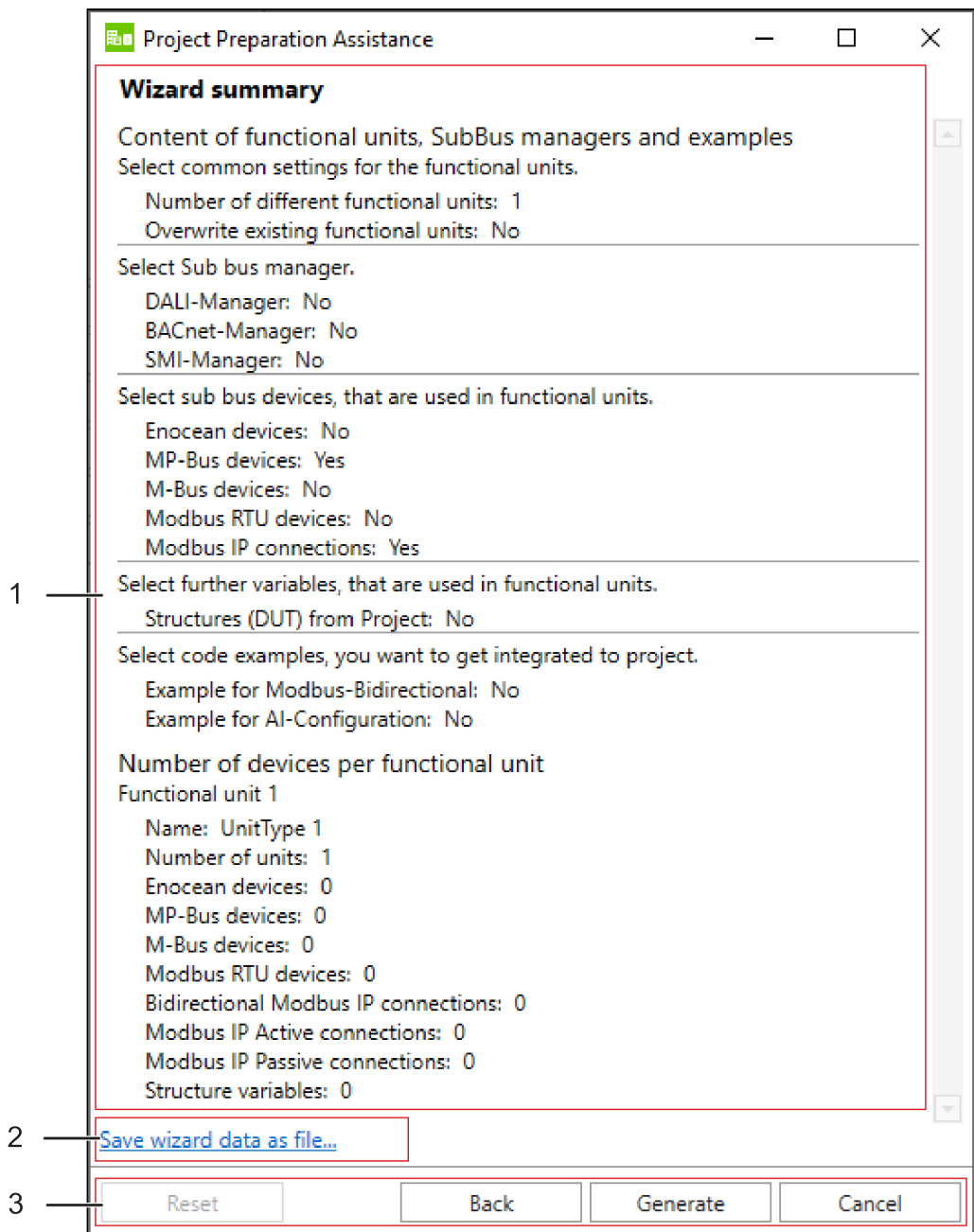


Figure 124: IEC Development Environment: "Wizard Summary" Application Wizard Dialog

Position	Designation	Description
1	Summary	Displays an overview of all settings that have been made before parts of a program are generated.
2	Save Data as File ...	Saves the settings that have been made as a ".wizarddata" file.
3	[Reset]	Resets all settings that have been made.
	[Back]	Displays the previous dialog.
	[Generate]	Applies the settings that have been made and generates the corresponding parts of the program.
	[Cancel]	Cancels the operation.

8.2.1.1.1.3 Log

This dialog window displays an overview of all the steps taken. This process can be aborted at any time, even while being generated.

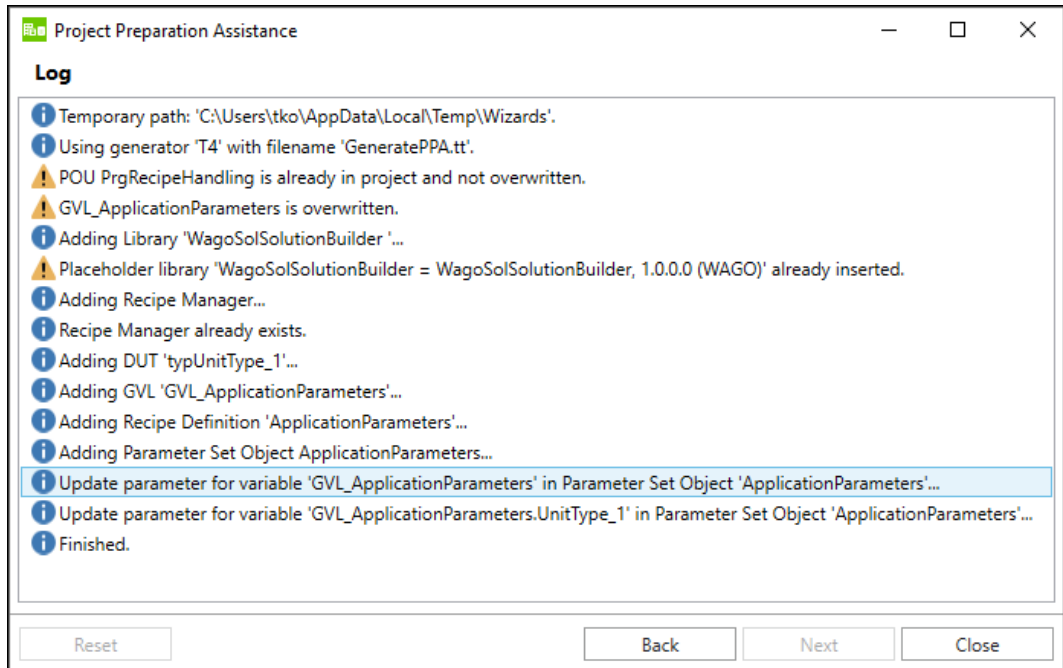


Figure 125: IEC Development Environment: "Log" Application Wizard Dialog

8.2.1.2 "Manager" Objects in the Program Structure

The "Managers" objects can be added to the project individually from the context menu once the WAGO Solution Builder Plug-in software is installed by right-clicking on the program structure tree in the development environment.

The device and project information from the configurators is then displayed in the workspace of the IEC Development Environment window. Double-clicking on one of the "Manager" objects opens a corresponding tab in the workspace.

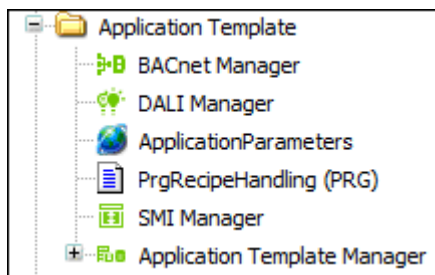






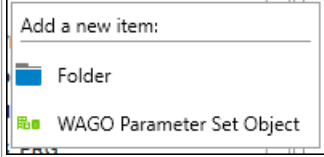


Figure 126: "Manager" objects in the program structure of a development environment

Icon	Designation	Description
	<p>BACnet Manager</p>	<p>A "BACnet Manager" object is added to the program structure to manage a WBC project file directly in the IEC Development Environment project.</p> <p>The WBC project file can be opened from the main menu via the [Open in WAGO BACnet Configurator] button. Digital and analog channels of the hardware modules or logical BACnet objects can be imported. All commands in the main menu always refer to the active application. When you close the configurator, the "BACnet Manager" object is synchronized with any changes you made, and the corresponding program code is then generated.</p> <p>The object editor displays a list of the BACnet objects in the project in the workspace.</p> <p>Note: Note that the name of the controller in the IEC development environment project must match the device name in the WBC project file. The name is applied automatically when data is imported into the WBC project file. If you change one of these names at a later time, the other name must also be changed.</p>
	<p>DALI Manager</p>	<p>A "DALI Manager" object is added to the program structure to manage a WDC project file directly in the IEC Development Environment project.</p> <p>The WDC project file can be opened in the ribbon via the [Open in WAGO DALI Configurator] button. All commands in the main menu always refer to the active application. When you close the configurator, the "DALI Manager" object is synchronized with any changes you made.</p> <p>The object editor displays statistics about the project content in the workspace.</p>
	<p>Formula Manager</p>	<p>The Formula Manager is a component of the IEC Development Environment and is used to manage formula definitions.</p> <p>Right-clicking on "Formula Manager" opens the "Add New Item" context menu. A new "Formula Definition" can be added here.</p> <div data-bbox="807 1256 1031 1413" style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>Add a new item:</p> <ul style="list-style-type: none">  Folder  Recipe Definition </div> <p>Detailed information is available in the manual of the IEC Development Environment.</p>
	<p>SMI Manager</p>	<p>An "SMI Manager" object is added to the program structure to manage a WSC project file directly in the IEC Development Environment project.</p> <p>The WSC project file can be opened in the main menu via the [Open in WAGO SMI Configurator] button. All commands in the main menu always refer to the active application. When you close the configurator, the "SMI Manager" object is synchronized with any changes you made.</p> <p>The object editor displays statistics about the project content in the workspace.</p>

Icon	Designation	Description
	Application Template Manager	<p>The Application Template Manager is used to create application templates and contains all properties, as well as the functional structure and parameter set objects of an application.</p> <p>Right-clicking on Application Template Manager opens the "Add New Item" context menu. Here you can add a new WAGO Parameter Set Object.</p>



8.2.1.2.1 BACnet Manager

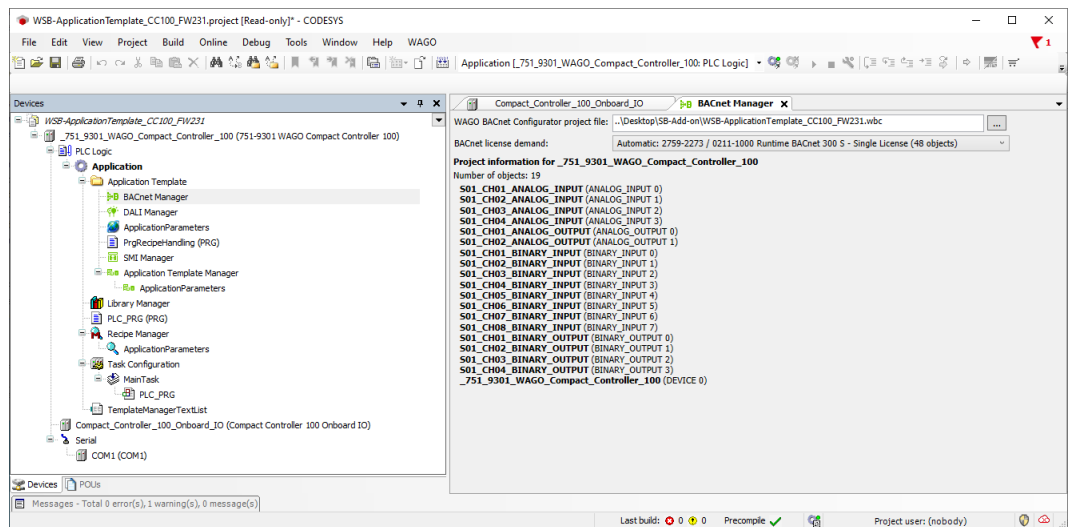


Figure 127: IEC Development Environment: BACnet Manager Program Structure and Workspace

BACnet Workspace

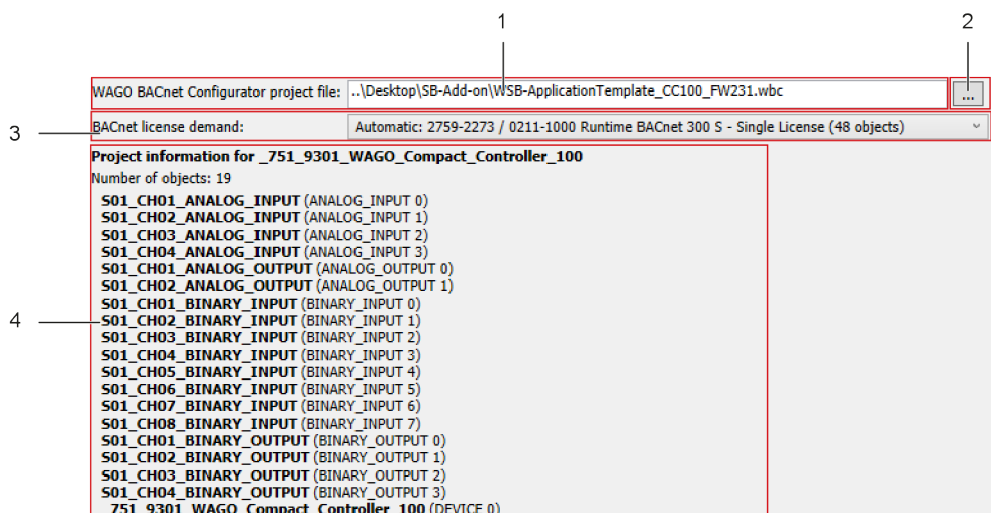


Figure 128: IEC Development Environment: BACnet Manager Workspace

Position	Designation	Description
1	Project file for WAGO BACnet Configurator	Option for entering the path to the BACnet Configurator project file with the extension *.wbc.

Position	Designation	Description
2	File Selection	<div style="border: 1px solid #ccc; padding: 5px; width: fit-content;"> <input type="text" value="..."/> </div> <p>Opens a dialog for selecting the BACnet Configurator project file.</p>
3	Required BACnet License	<p>For BACnet controllers (item number 0750-8212/0000-0100), no selection is possible at this point.</p> <div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 10px;"> <p>WAGO BACnet Configurator project file: RoomControl.wbc <input type="text" value="..."/></p> <p>BACnet license demand: <input type="text" value="Factory-covered license (∞ objects)"/></p> <p>Project information for PFC200_BACnet_750_8212_000_100</p> <p>Number of objects: 33</p> <p>S01_CH01_BINARY_INPUT (BINARY_INPUT 0)</p> <p>CO1_PL01_BINARY_INPUT (BINARY_INPUT 0)</p> </div> <p>If no BACnet controller is used, a BACnet license can be selected here.</p> <p>If a BACnet license has already been purchased, the object volume of the existing license can be selected here.</p> <p>If no license exists yet, a license recommendation appears based on the current project.</p> <div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 10px;"> <p>board_IO <input type="text" value="BACnet Manager x"/></p> <p>... \Desktop\SB-Add-on\WSB-ApplicationTemplate_CC100_FW231.wbc <input type="text" value="..."/></p> <p>Automatic: 2759-2273 / 0211-1000 Runtime BACnet 300 S - Single License (48 objects)</p> <p>Automatic: 2759-2273 / 0211-1000 Runtime BACnet 300 S - Single License (48 objects)</p> <p>None</p> <p>2759-2273 / 0211-1000 Runtime BACnet 300 S - Single License (48 objects) (recommended)</p> <p>2759-2283 / 0211-1000 Runtime BACnet 300 M - Single License (256 objects)</p> <p>2759-0283 / 0211-1000 Runtime BACnet 300 - Single License (∞ objects)</p> </div> <p>Note: The WAGO "Licensing" add-on is required for recognizing BACnet licenses and receiving license recommendations (see Require-ments > 12).</p>
4	Device Information for xxx from Project File	<p>Shows a summary of the contents of the selected BACnet project.</p> <p>The total of all BACnet objects and a list of all objects are shown.</p>

8.2.1.2.2 DALI Manager

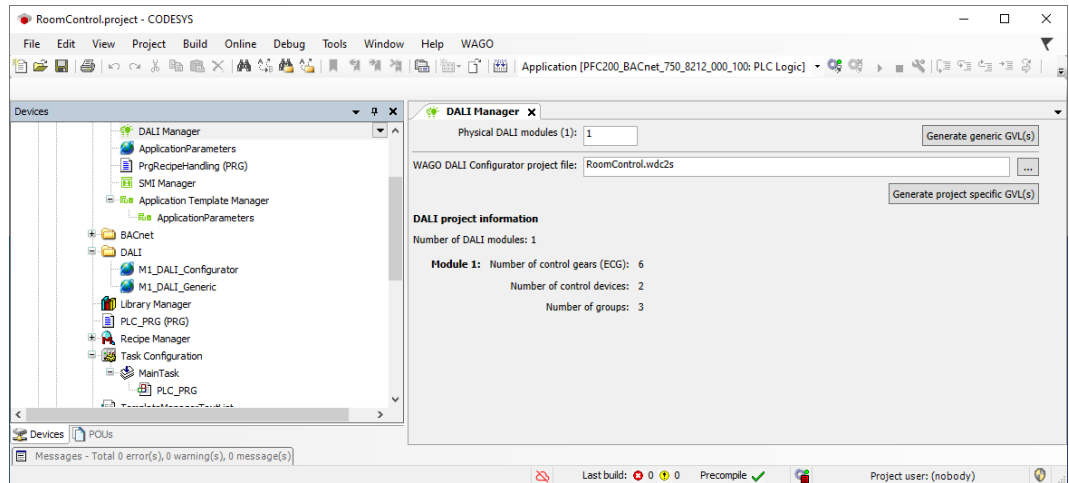


Figure 129: IEC Development Environment: DALI Manager Program Structure and Workspace

DALI Workspace

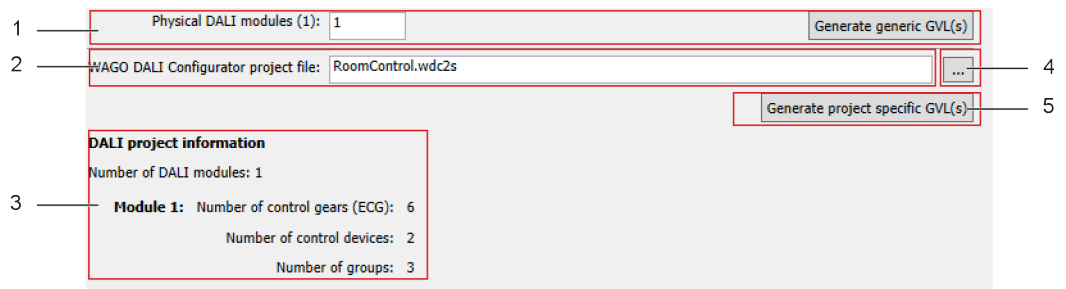


Figure 130: IEC Development Environment: DALI Manager Workspace

Position	Designation	Description
1	Physical DALI Modules	Displays and allows you to enter the number of physical DALI modules in the hardware configuration for the application used.
	[Generate Generic GVL(s)]	Generates a generic global variable list (program code) for using DALI in the IEC application.
2	Project File for WAGO DALI Configurator	Option for entering the path to the DALI Configurator project file with the suffix *.wdc2c.
3	DALI Project Information	Shows a summary of the contents of the selected DALI project. A list of all the implemented DALI devices appears.
4	File Selection	Opens a dialog for selecting the DALI Configurator project file.
5	[Generate Project-Specific GVL(s)]	Generates a project-specific global variable list (program code) for using DALI in the IEC application.

8.2.1.2.3 SMI Manager

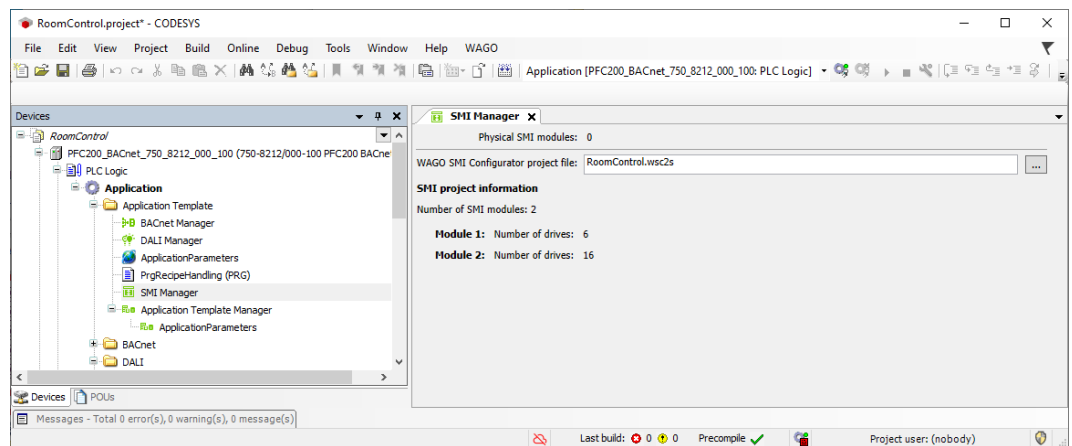


Figure 131: IEC Development Environment: SMI Manager Program Structure and Workspace

SMI Workspace

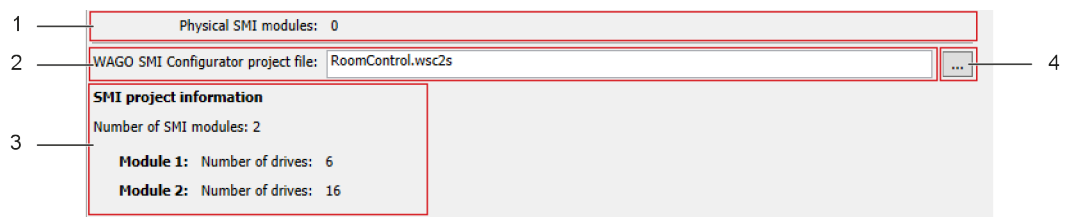


Figure 132: IEC Development Environment: SMI Manager Workspace

Position	Designation	Description
1	Physical SMI Modules	Shows the number of physical SMI modules in the hardware configuration of the application used.
2	Project File for WAGO SMI Configurator	Option for entering the path to the SMI Configurator project file with the suffix <i>*.wdc2c</i>
3	SMI Project Information	Shows a summary of the contents of the selected SMI project. A list of all the implemented SMI drives appears.
4	File Selection	<input type="text" value="..."/> Opens a dialog for navigating to the SMI Configurator project file

8.2.1.2.4 Formula Manager

To create an application template the settings in the Formula Manager in the tab "Storage" must meet the following specifications to fulfill the necessary requirements.

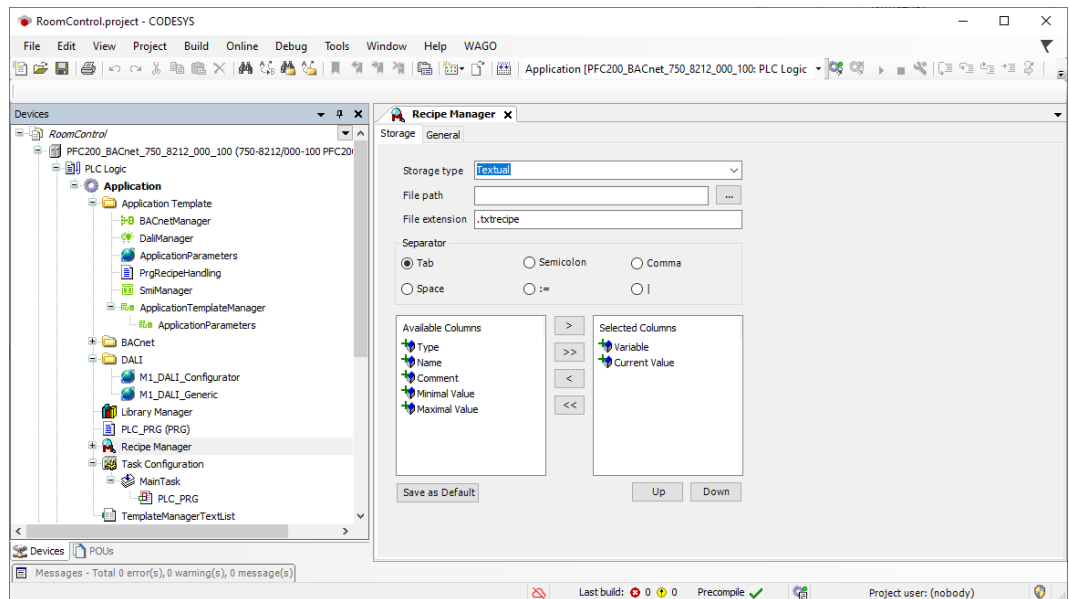


Figure 133: IEC Development Environment: Program structure and workspace of the formula manager

8.2.1.2.4.1 "Storage" Tab

The following settings are required for creating an application template.

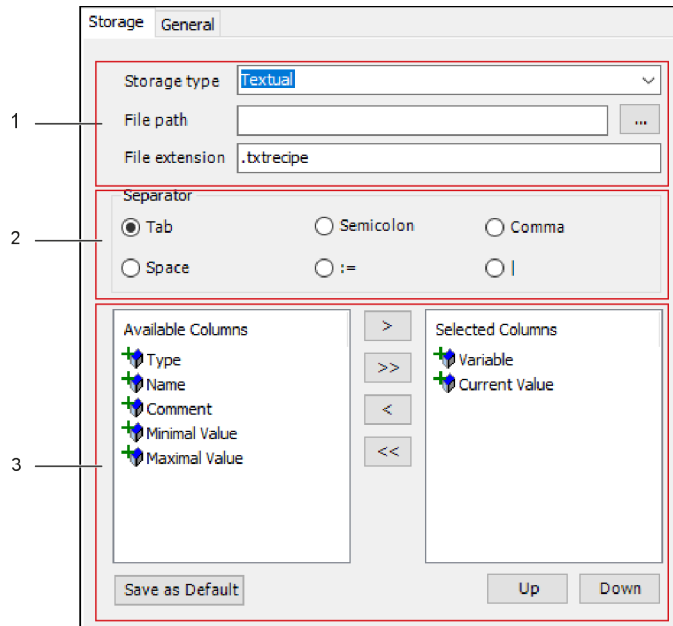


Figure 134: IEC Development Environment: Workspace of the Formula Manager > "Save" Tab

Position	Designation	Required Setting	
1	Type of storage	Textual	
	File Path	Blank or ./.	
	File extension	.txtrecipe	
2	Delimiter	Tab	
3	Column selection	Selected columns	Variable
			Current Value

8.2.1.2.4.2 "General" Tab

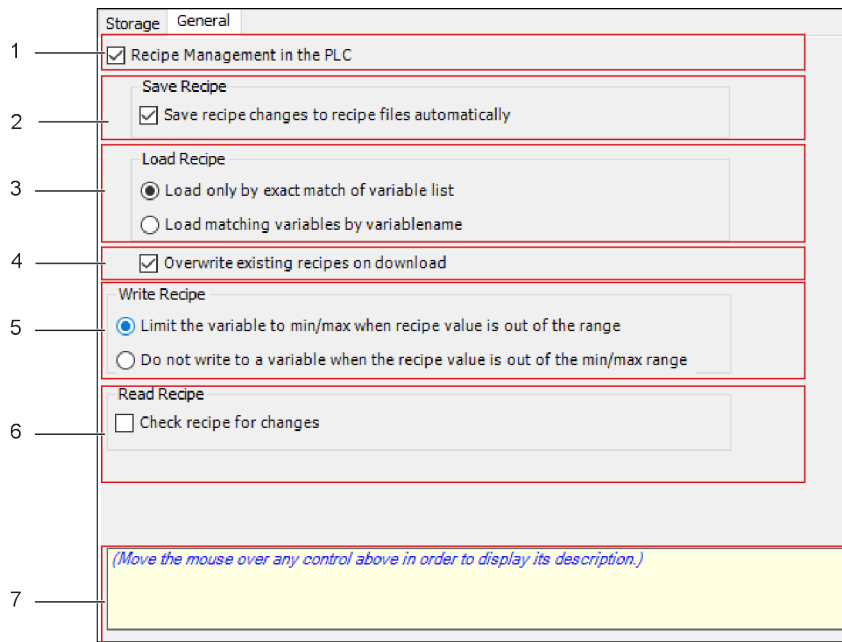


Figure 135: IEC Development Environment: Workspace of the Formula Manager > "General" Tab

Position	Designation	Description
1	Formula Management in the PLC	<input type="checkbox"/> Disables the following options: "Save Formula," "Load Formula" and "Overwrite Existing Formula on Download."
		<input checked="" type="checkbox"/> A POU (Programming Organization Unit) is created in the run-time system for formula management.
2	Save Formula	
	Automatically Save Formula Changes to the Formula Files	<input type="checkbox"/> Does not automatically save changes. <input checked="" type="checkbox"/> Automatically saves formulas to a file after a change.
3	Load Formula	
	Only Load If Variable List Matches Exactly	<input checked="" type="radio"/> Loads a formula file only if it contains all the variables from the list of variables of an application's formula definition.
	Load Variables with Matching Names	<input checked="" type="radio"/> All matching variable names are loaded from the formula file. Note: No notification is given if there are differences between the formula file and the formula definition of an application.
4	Overwrite Existing Formulas on Download	<input type="checkbox"/> Existing formulas are not overwritten when a new application is initialized. <input checked="" type="checkbox"/> Existing formulas may be overwritten when a new application is initialized.
	Write Formula	
5	Limit Variable to Min/Max If Formula Outside Range	<input checked="" type="radio"/> If the formula contains a value outside the value range entered in the definition, the specified minimum or maximum value is written to the PLC variable instead of this value.
	Do Not Write Variable If Formula Outside Min/Max Range	<input checked="" type="radio"/> If the formula contains a value that is outside the value range entered in the definition, no value is written to the PLC variable. It retains its current value.
6	Check Formula for Changes	<input type="checkbox"/> Formula is saved without additional checks. <input checked="" type="checkbox"/> Generates additional code to save a formula only if it is changed by using "ReadAndSaveRecipe."
	Tooltips	Moving the mouse over one of the elements listed above causes an additional tooltip to appear at this point.

8.2.1.2.5 Application Template Manager

An Application Template Manager object is used to create application templates. It allows configuration of the application template managers' metadata and contains parameter set objects. The Application Template Manager is divided into four tabs:

- "General" Tab
- "Functional Structure" tab
- "Dependencies" Tab
- "Files" Tab

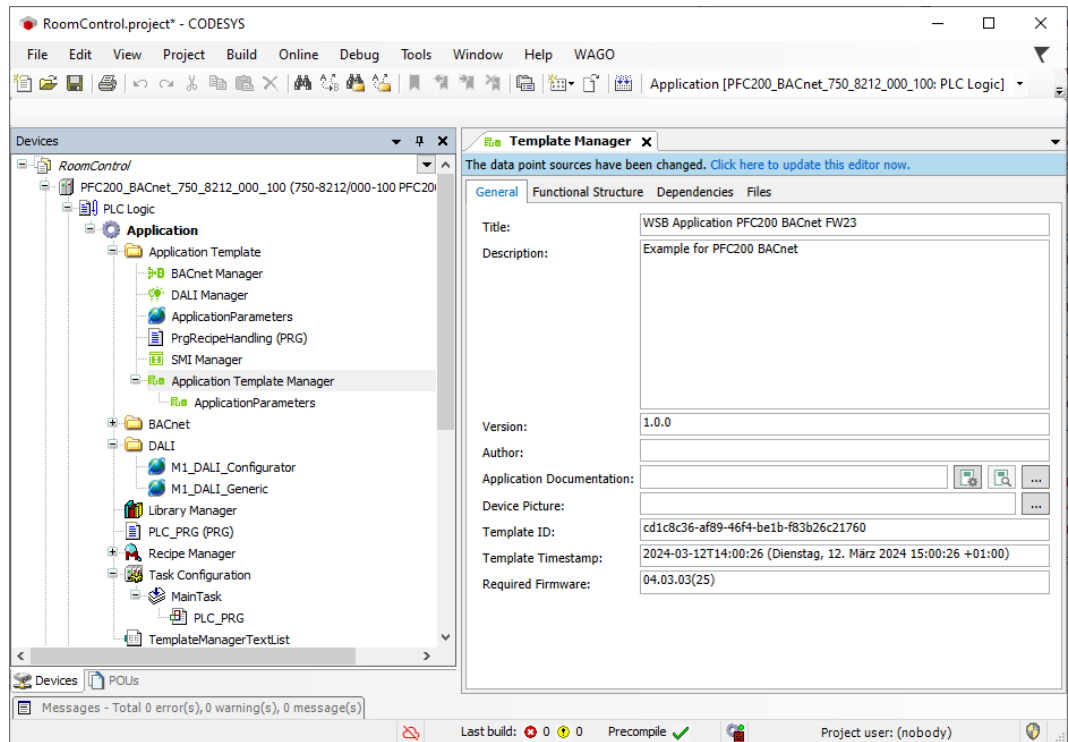


Figure 136: IEC Development Environment: Program Structure and Workspace of the Application Template Manager

8.2.1.2.5.1 “General” Tab

The “General” tab contains fields for describing the application template.

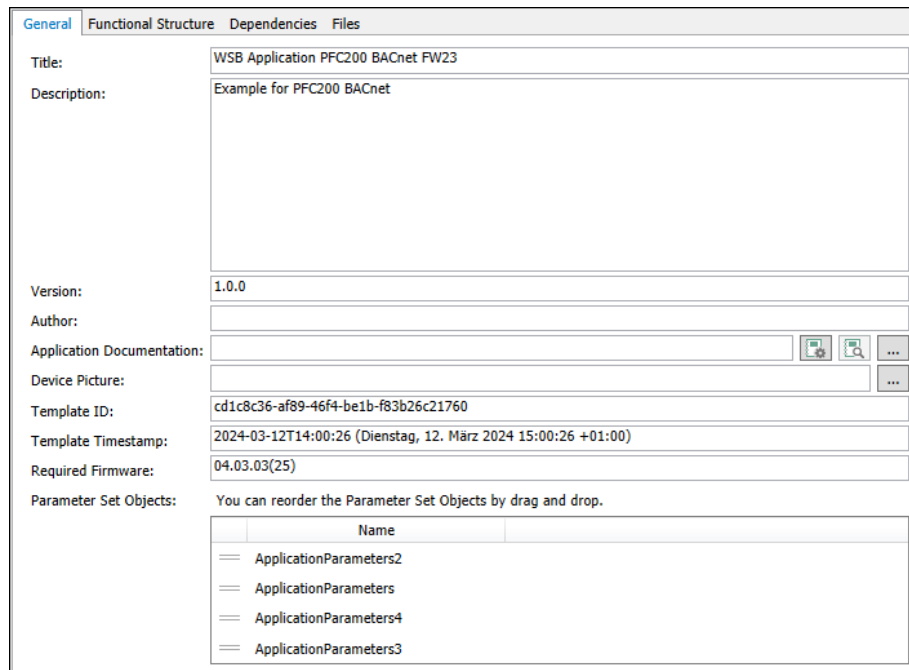






Figure 137: IEC Development Environment: Application Template Manager Workspace > “General” Tab

Designation	Description
Title	Here you can enter the title of the application template. The title is also used as a name in the WAGO Solution Builder software.

Designation	Description
Description	Here you can enter a description of the application template. The description might, for example, describe the function of the application or document changes that have been made.
Version	Optional field: Shows the version of the application template. This field is only displayed by the WAGO Solution Builder software, not evaluated.
Author	Optional field: Here you can enter the name of the application template developer.
Application Documentation	Optional field: Here you can save documentation for the application as a PDF document. <i>Example:</i> One possible example for saved documentation is the documentation for the program code of an application.
	 Generate Application Documentation Automatically generates the project documentation from the IEC development environment as a PDF document. The PDF document is attached to the application template.
	 Open Application Documentation Opens the attached PDF documentation.
	 Opens a dialog for navigating to whatever PDF document you want to attach as documentation. This serves as an alternative to the project documentation generated by the IEC development environment used.
Device Image	Optional field: Here you can enter a path to a graphic to use as the image for the application template.
	 Opens a dialog for navigating to a graphics file in order to attach it to the application template.
Template ID	Here you can enter a unique application template ID. The WAGO Solution Builder software identifies the application template on the basis of this ID. If you want to edit an existing application template, a new application template ID must not be generated; the existing ID must remain constant. If a new application template or a separate version is created that the WAGO Solution Builder software recognizes as a separate application template, you can right-click on the template and use the context menu to generate a new ID.
Template Timestamp	Shows the timestamp for when the application template was last exported.
Required Firmware	Shows the required firmware version of the controller.
Parameter Set Objects	Shows a list of existing Parameter Set objects and allows them to be sorted with drag-and-drop gestures. The order defined here is carried over to the WAGO Solution Builder software.

8.2.1.2.5.2 "Functional Structure" Tab

You can use the "Functional Structure" tab to optionally populate the Application template with a data model based on an addressing system. The data model describes data points of the application template and their functional relationships in a hierarchical structure, e.g., BACnet objects or hardware I/O.

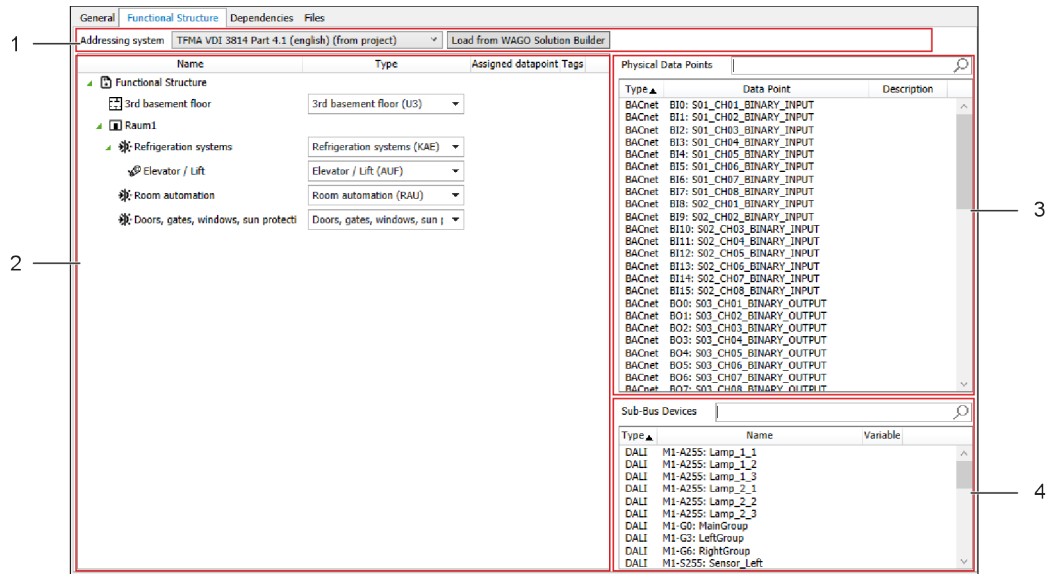


Figure 138: IEC Development Environment: Application Template Manager Workspace > "Functional Structure" Tab

Position	Designation	Description
1	Addressing system	<p>Here you can display and select the addressing system.</p> <p>Note: The addressing system can also be selected with the context menu (see ☰ "Functional Structure" Contextual Menu [▶ 146]).</p> <p>[Loading WAGO Solution Builder] Loads the addressing systems from Solution Builder and provides them in the drop-down menu.</p>
2	Functional Structure	<p>Here you can configure the functional structure.</p> <p>Based on the selected addressing system, you can then set up a structure tree, starting from any level that ends with items of type "Data Point."</p> <p>Right-clicking on an existing structural element opens a context menu; see ☰ "Functional Structure" Contextual Menu [▶ 146] below.</p> <p>Note: Data points shown in red are not in the project.</p> <p><i>Example:</i> Assuming an Application template can control up to eight rooms, then eight individual trees are created here, beginning at the "Room" level, and these trees assign the data points to the corresponding rooms.</p> <p>To link BACnet objects or hardware I/Os to data points, drag a data point from the "Physical Data Points" area and drop it on a data point in the "Functional Structure" area.</p>
3	Physical Data Points	<p>Displays a list of BACnet objects and hardware I/O that have not yet been assigned to a data point.</p> <p>Note: The full-text search field above the list can be used for searching within the list.</p>
4	Sub-Bus Devices	<p>Displays a list of all sub-bus devices implemented in the Application template being used.</p> <p>Note: The full-text search field above the list can be used for searching within the list.</p>

8.2.1.2.5.2.1 "Functional Structure" Contextual Menu

Right-clicking on an existing structure item in the "Functional Structure" tab opens the following contextual menu.

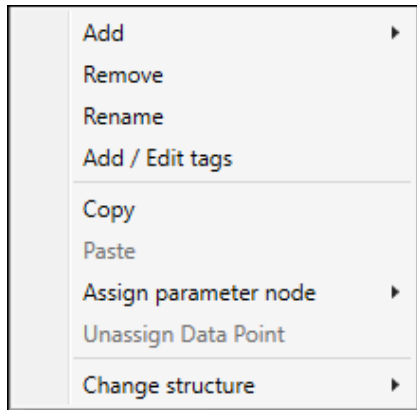
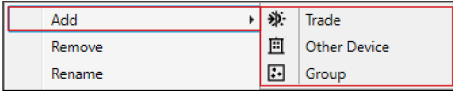
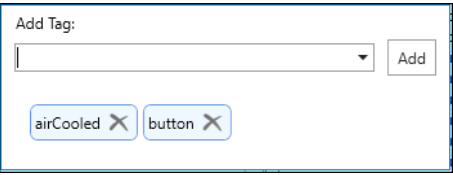
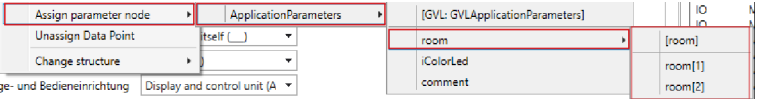



Figure 139: Application Template Manager > "Functional Structure" Tab > Workspace > Context Menu

Menu Item	Description
Add	<p>Adds a structural element.</p> <p>The submenu contains all the elements from the addressing system allowed at this point (structure definition).</p> 
Remove	Deletes the selected structural element.
Rename	<p>Changes the name of the selected structural element.</p> <p><i>Alternative option:</i></p> <p>In the "Name" column, left-click on the structural element you want.</p>
Add/Edit Tags	<p>Adds new tags and/or removes existing ones.</p>  <p><i>Alternative option:</i></p> <p>Left-click in the "Tags" column.</p>
Copy	Copies the selected structural element(s) to the clipboard.
Paste	Pastes the structural element from the clipboard.
Assign Parameter Nodes	<p>Selects a structure variable (parameter node) from a Parameter Set Object (PSO) and assigns it to the structural element as a data point.</p> <p>The structure of the context menu corresponds to the structure of the Parameter Set Object. The menu item with square brackets is used to select the higher-level variable.</p>  <p>Once parameter nodes have been assigned, only the specific variable content appears in the WAGO Solution Builder software.</p>
Cancel Data Point Assignment	Removes the link between the physical data point and the data point in the functional structure.

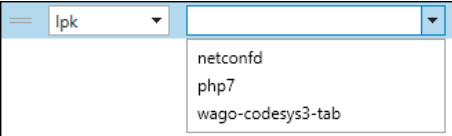


Menu Item	Description
Modify Structure	<p>Switches to a different addressing system (structure definition).</p> <p>The addressing systems that come standard are displayed.</p> <p>This function can also be used in case the addressing system is changed to a newer version. The project saves the addressing system used up to this point. If a new addressing system is provided via the WAGO Solution Builder Plug-in software, you can use this menu item to update the addressing system to the new version.</p> 

8.2.1.2.5.3 "Dependencies" Tab

An Application template can be based on specific software packages, provided these are installed on the controller. The dependencies for third-party software can be defined here.



Figure 140: IEC Development Environment: Application Template Manager Workspace > "Dependencies" Tab

Position	Designation	Description
1	☰	<p>Used for sorting entries. Entries can be sorted individually by dragging them with the mouse.</p> <p>The order of the sorted entries determines the installation order.</p>
2	Type	<p>Shows the package type. The following package types are available:</p> <ul style="list-style-type: none"> • IPK • Docker
	Name	<p>Shows the name of the package.</p> <p>The selection list offers package names provided by Solution Builder.</p> 
	Version	<p>Shows the required version number of the package.</p> <p>If a package that has been transferred by Solution Builder is entered under "Name," a list of known version numbers is also listed here in the selection list.</p> <p>If no specific version is specified, WSB will use the most recent available version later during installation.</p>
	Comments	<p>Here you can enter individual comments, e.g., information about the scope of functions/applications of the package in the application.</p>
3	Load List of Available Packages from WAGO Solution Builder	Loads the list of available packages.
4		Adds a new empty entry to the package list.
		Deletes the marked item. Multiple items can be selected.

8.2.1.2.5.4 "Files" Tab

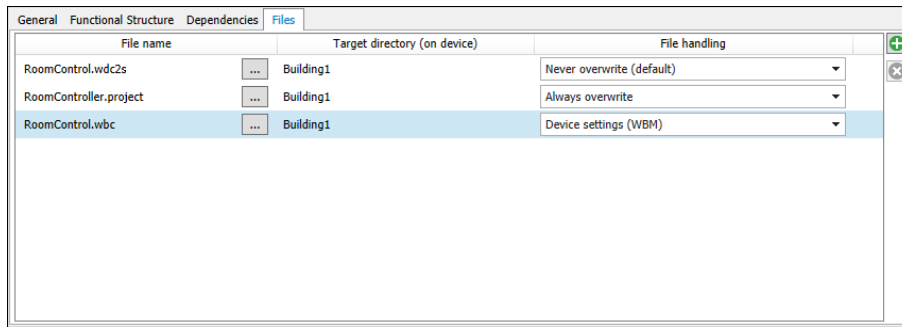


Figure 141: IEC Development Environment: Application Template Manager Workspace > "Files" Tab

Designation	Description						
Filename	Option for selecting the file to transfer to the target device (controller). It can be selected with the button (<input type="button" value="..."/>) or by entering it manually.						
Target Directory (on the Device)	Option for entering the target directory on the target device (controller). If this field is empty, the file is copied to the <code>/home/codesys/PlcLogic</code> directory. Absolute paths can be entered. <i>Example:</i> <code>/etc/myfolder/logs</code> Path can also be relative to PlcLogic. <i>Example:</i> If "myfolder" is entered in the field, the file is saved to the <code>/home/codesys/PlcLogic/myfolder</code> directory.						
File Handling	Option for selecting how the target device (controller) should handle the file. The following options are available: <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <input type="text"/> Never overwrite (default) Always overwrite Device settings (WBM) </div> <table border="1" style="width: 100%; margin-top: 5px;"> <tbody> <tr> <td>Never Overwrite</td> <td>If a file already exists it is retained. The selected file is not transferred. This is the default behavior.</td> </tr> <tr> <td>Always Overwrite</td> <td>If a file with the same name already exists, this overwrites it. The selected file is always transferred.</td> </tr> <tr> <td>Device Settings (WBM)</td> <td>Changes settings of the target device (controller).</td> </tr> </tbody> </table>	Never Overwrite	If a file already exists it is retained. The selected file is not transferred. This is the default behavior.	Always Overwrite	If a file with the same name already exists, this overwrites it. The selected file is always transferred.	Device Settings (WBM)	Changes settings of the target device (controller).
Never Overwrite	If a file already exists it is retained. The selected file is not transferred. This is the default behavior.						
Always Overwrite	If a file with the same name already exists, this overwrites it. The selected file is always transferred.						
Device Settings (WBM)	Changes settings of the target device (controller).						

8.2.1.2.5.5 Application Parameters

Application parameters (**Parameter Set Objects**) are always linked to formula definitions from an IEC Development Environment. The naming of formula definitions is subject to the strict CODESYS rules (e.g., no spaces or special characters). Here however, you can rename the parameters and describe them in more detail. These settings will be visible later on the configuration screen of the corresponding application in the WAGO Solution Builder software.

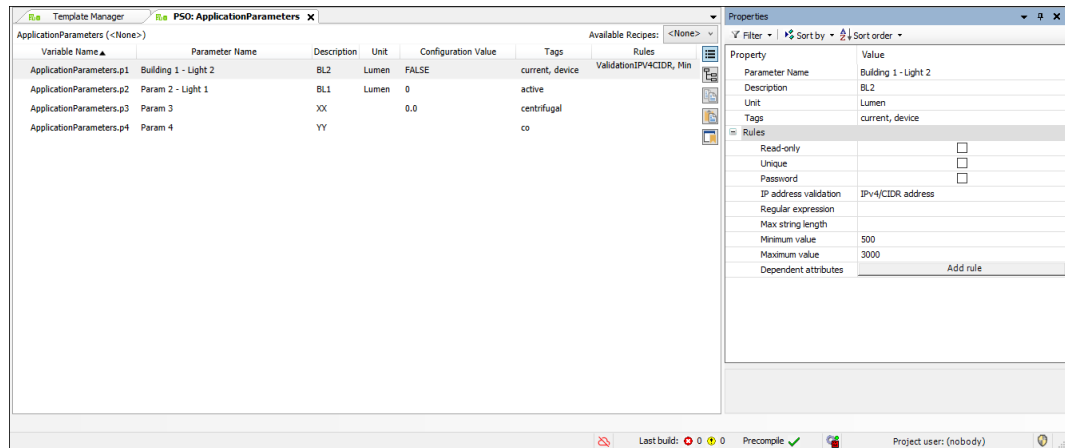
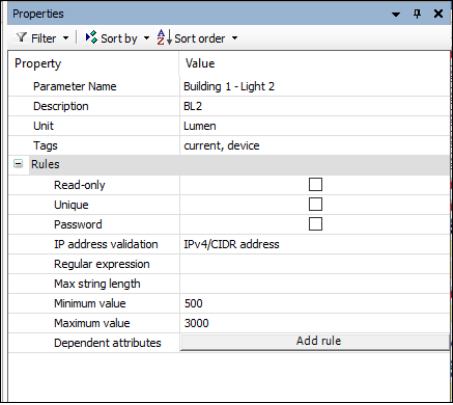


Figure 142: IEC Development Environment: Workspace of the Application Template Manager > Application Parameters

Designation	Description
Available Formulas	Here you can select a formula. Normally, the "<None>" selection is used.
Variable Name	Here you can display and edit the name of the parameter from the IEC Development Environment's formula definition.
Parameter Name	Optional field: Here you can view and edit the parameter name in the WAGO Solution Builder software. This field accepts special characters.
Configuration Value	Shows the value defined for a parameter in the program code or in the selected formula. <ul style="list-style-type: none"> Gray text: The value comes from the program code. Black text: The value comes from the formula selected under "Available Formulas." Note: If a formula is selected, but the value is still gray, the formula does not overwrite the value.
Description	Optional field: Here you can display and edit the description of the parameter in the WAGO Solution Builder software.
Tags	Optional field: Here you can display and edit the parameter tags. A selection list of all tags appears when the field is selected; any number of tags can be selected and thus assigned to a parameter.
Unit	Optional field: Here you can display and edit the physical unit of the parameter value.

Designation	Description
Rule	<p>Optional field:</p> <p>Here you can display and edit the parameter rules.</p> <p>When this field is selected, a Properties window opens in which rules can be selected or new rules created.</p>  <p>Note:</p> <p>The contents of the other columns for a parameter can also be edited in the properties window.</p>

8.2.1.2.5.6 "WAGO Parameter Set Objects"

The "Add WAGO Parameter Set Object" dialog displays all the formula definitions in the project which have not yet been linked to a "WAGO Parameter Set Object." When you select a formula definition, you can use the **[Add]** button to create the associated "WAGO Parameter Set Object."

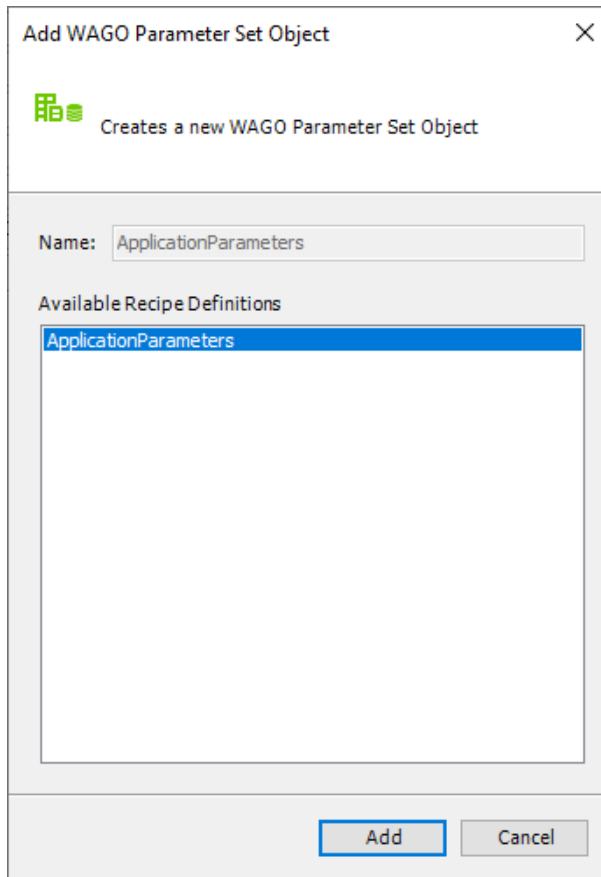


Figure 143: Program Structure of an IEC Development Environment > Application template > "Parameter Set Object" Context Menu > "Add WAGO Parameter Set Object" Dialog

8.2.2 e!COCKPIT IEC Development Environment

The WAGO Solution Builder Plug-in software is an extension for **IEC development environments** and supports the creation of **application templates** for building automation applications. The created application templates are linked to devices in the WAGO Solution Builder software. Any number of application template instances can be created. The application template specifies the devices (item number), node setup and firmware to use.

The graphical user interface within the IEC Development Environment has the following structure.

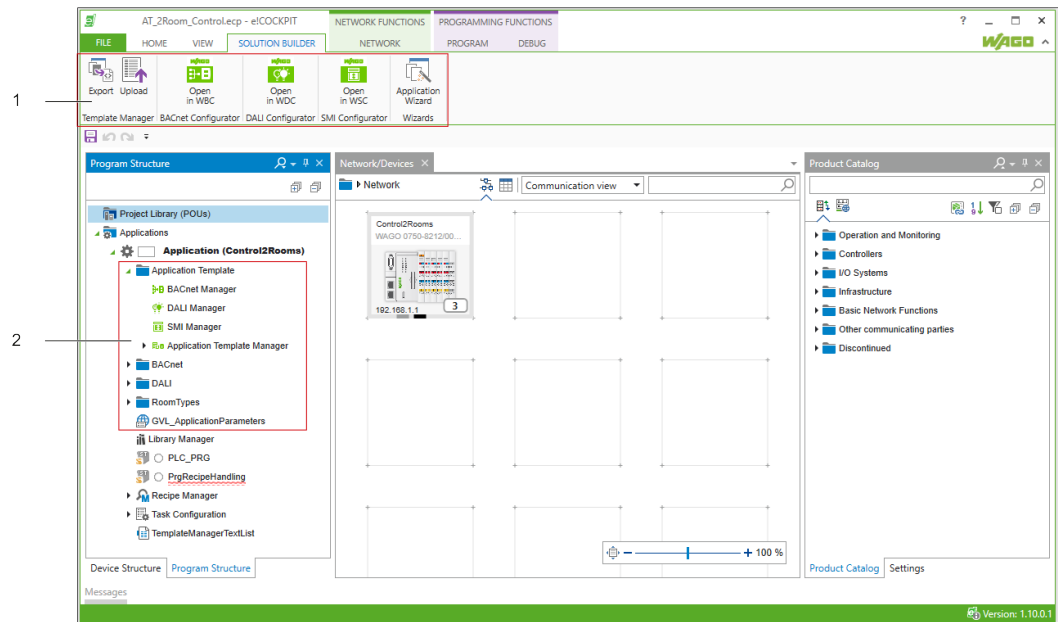


Figure 144: Structure of the Graphical User Interface – Main Areas (e!COCKPIT)

Position	Designation	Description
1	Main menu	Contains the main buttons, e.g., for exporting a completed application template or calling up configurators.
2	“Manager” Objects	Manage the projects of the configurators within the program structure of development environments.

You can find more information in:

- [“Solution Builder” Main Menu \(Ribbon\) \[> 152\]](#)
- [“Manager” Objects in the Program Structure \[> 157\]](#)

8.2.2.1 “Solution Builder” Main Menu (Ribbon)

i Note

Commands always refer to active application

The commands in the main menu always refer to the active application. An active application is always highlighted in bold in the structure tree.

The ribbon for the WAGO Solution Builder Plug-in software in the e!COCKPIT development environment allows you to open individual configurators for BACnet, DALI and SMI in e!COCKPIT mode. In addition, the application templates can be imported and exported.

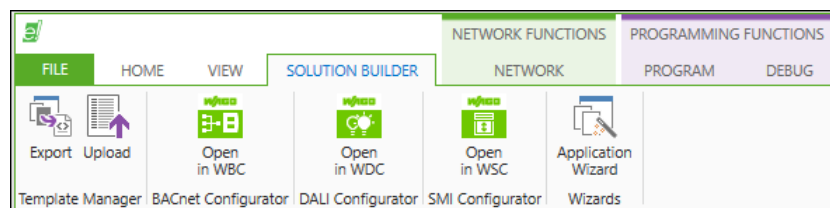

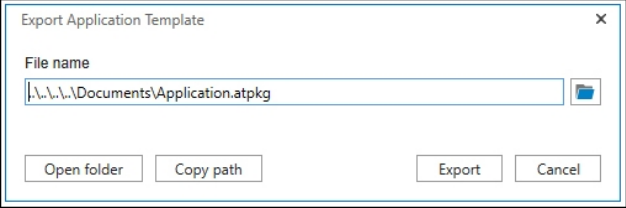

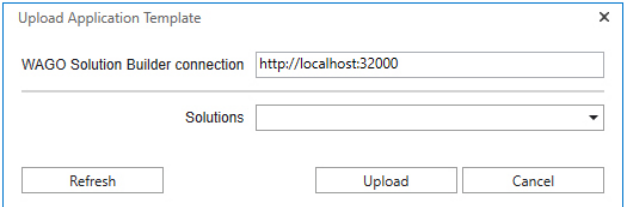






Figure 145: WAGO Solution Builder Plug-in Software e!COCKPIT Ribbon

Icon	Designation	Description
	Export Application Template	<p>Opens the "Export Application Template" dialog for exporting the application template.</p>  <p>The application is exported as an *.atpkg file.</p>
	Upload Application Template	<p>Opens the "Upload Application Template" dialog for uploading an application template.</p>  <p>Under "Connection to WAGO Solution Builder," you must enter the URI (Uniform Resource Identifier) for the WAGO Solution Builder software. The URI is normally already specified.</p> <p>Clicking on the "Solutions" drop-down menu opens a list of all the solutions created in the WAGO Solution Builder software. Here you can directly select the target solution and upload the application template to the solution without having to use an export file.</p>
	Open in WAGO BACnet Configurator	<p>Opens the WAGO BACnet-Konfigurator software in development environment mode.</p> <p>The project selected in the associated "Manager" object opens in the configurator.</p> <p>If no project is selected, you are asked if you want to create a new project.</p>
	Open in WAGO DALI Configurator	<p>Opens the WAGO DALI Configurator software in development environment mode.</p> <p>The project selected in the associated "Manager" object opens in the configurator.</p> <p>If no project is selected, you are asked if you want to create a new project.</p>
	Open in WAGO SMI Configurator	<p>Opens the WAGO SMI Configurator software in development environment mode.</p> <p>The project selected in the associated "Manager" object opens in the configurator.</p> <p>If no project is selected, you are asked if you want to create a new project.</p>
	Application Wizard	<p>Opens the "Select Wizard" dialog.</p> <p>A list of installed wizards appears.</p> <p>Wizards help you create an application template from a new or existing application.</p>

8.2.2.1.1 Application Wizard

Application wizards assist you in creating application templates from a new or existing application.

These wizards have a user interface that guides you through a number of configuration options you can enter; objects in the active application can then be created or modified from these. Thus an application wizard can generate an application or part of an application to meet the user’s needs. Depending on the wizard you are using, you may be able to add certain functions, create the basis for an application or create a complete application.

8.2.2.1.1.1 Start Screen

The application wizard start view shows a list of available wizards.

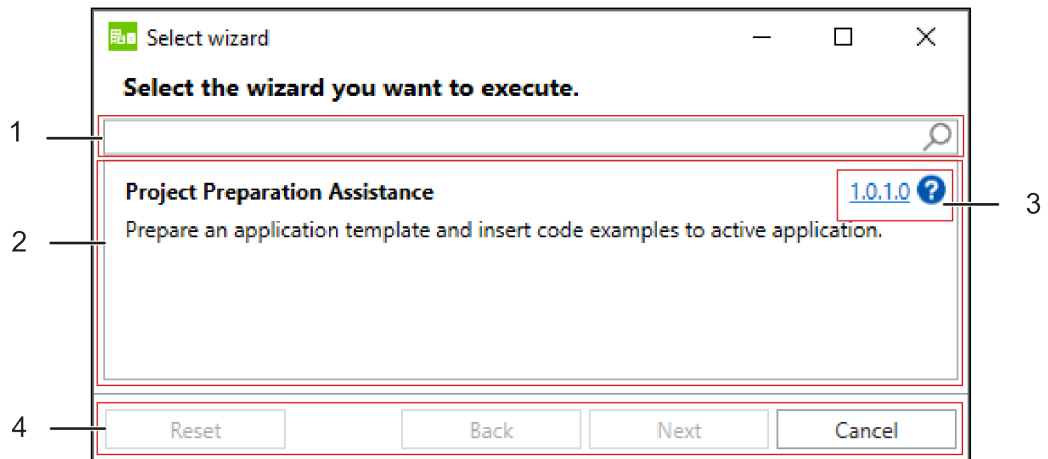



Figure 146: IEC Development Environment: Start View of the Application Wizard – “Select Wizard”

Position	Designation	Description
1	Search box	Searches the list of wizards for a search term. The wizard names and wizard descriptions are searched for the search term in the selected language and in the default language (English).
2	Wizard List	Shows all available wizards. Right-clicking on a wizard opens a context menu; see “Select Wizard” Contextual Menu [p. 133] below.
3	Help	 Opens the application notes for a wizard.
	Version and Release Notes	1.0.1.0 Shows the version of the wizard. You can open the release notes by clicking the version number.
4	[Reset]	Resets all settings that have been made.
	[Back]	Displays the previous dialog.
	[Next]	Displays the next dialog.
	[Cancel]	Cancels the operation.

8.2.2.1.1.1.1 “Select Wizard” Contextual Menu

Right-clicking on an Application Wizard in the “Select Wizard” dialog window opens the following contextual menu.

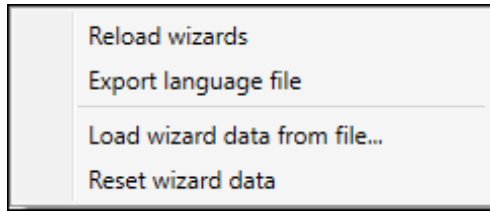


Figure 147: IEC Development Environment: Start View of the Application Wizard > "Select Wizard" Context Menu

Menu Item	Description
Reload Wizard	Reloads all application wizards. This can be useful for refreshing after changes, for example, or to update the version number after it has been re-imported.
Export Language File	Exports all the texts for the selected application wizard to a language file. The language file can then be translated into other languages so the application wizard can be used in different languages.
Load Data from File ...	Loads previously saved settings for the selected application wizard from a file.
Reset Data for This Wizard	Resets all settings that have been made for the selected application wizard.

8.2.2.1.1.2 Summary

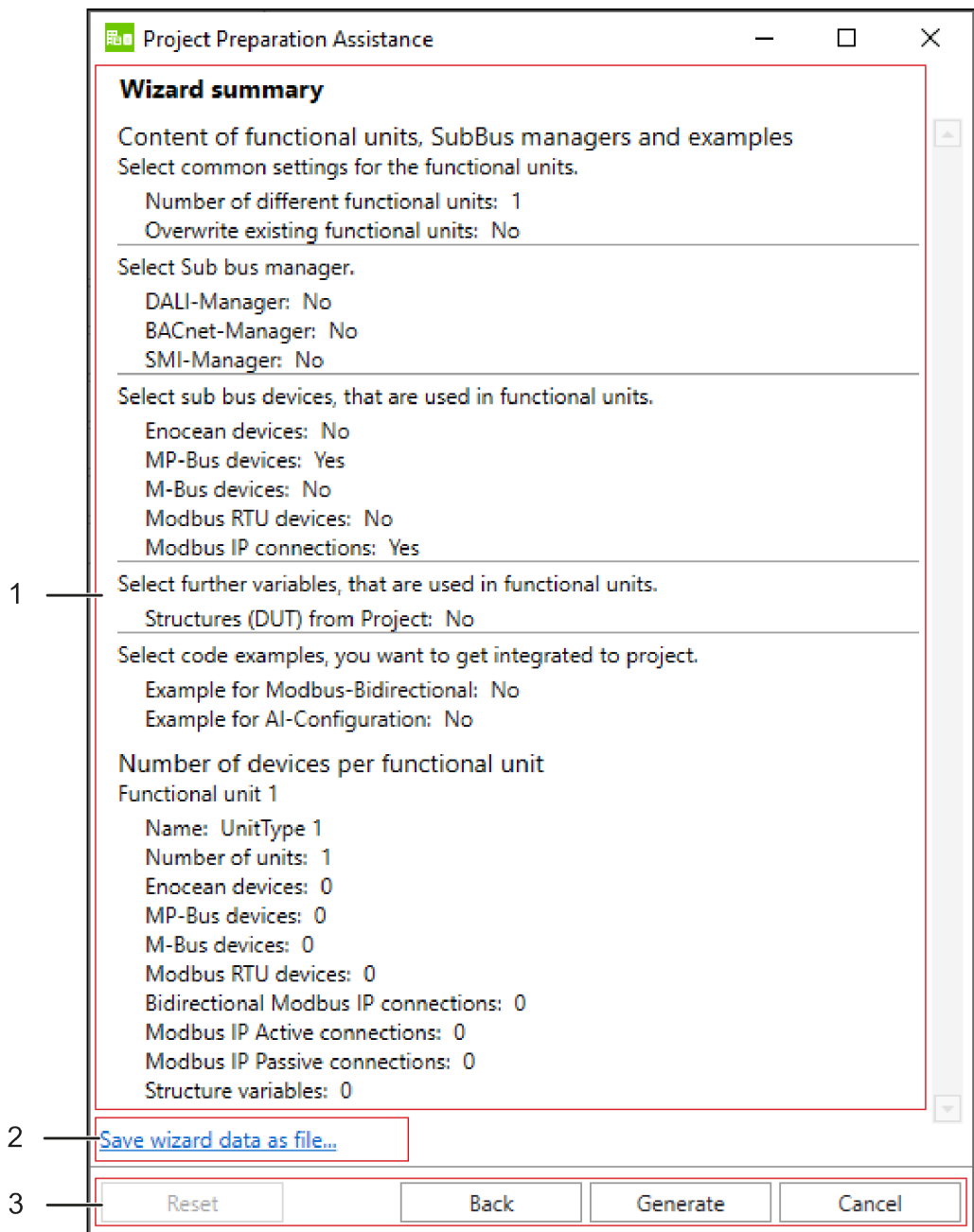


Figure 148: IEC Development Environment: "Wizard Summary" Application Wizard Dialog

Position	Designation	Description
1	Summary	Displays an overview of all settings that have been made before parts of a program are generated.
2	Save Data as File ...	Saves the settings that have been made as a ".wizarddata" file.
3	[Reset]	Resets all settings that have been made.
	[Back]	Displays the previous dialog.
	[Generate]	Applies the settings that have been made and generates the corresponding parts of the program.
	[Cancel]	Cancels the operation.

8.2.2.1.1.3 Log

This dialog window displays an overview of all the steps taken. This process can be aborted at any time, even while being generated.

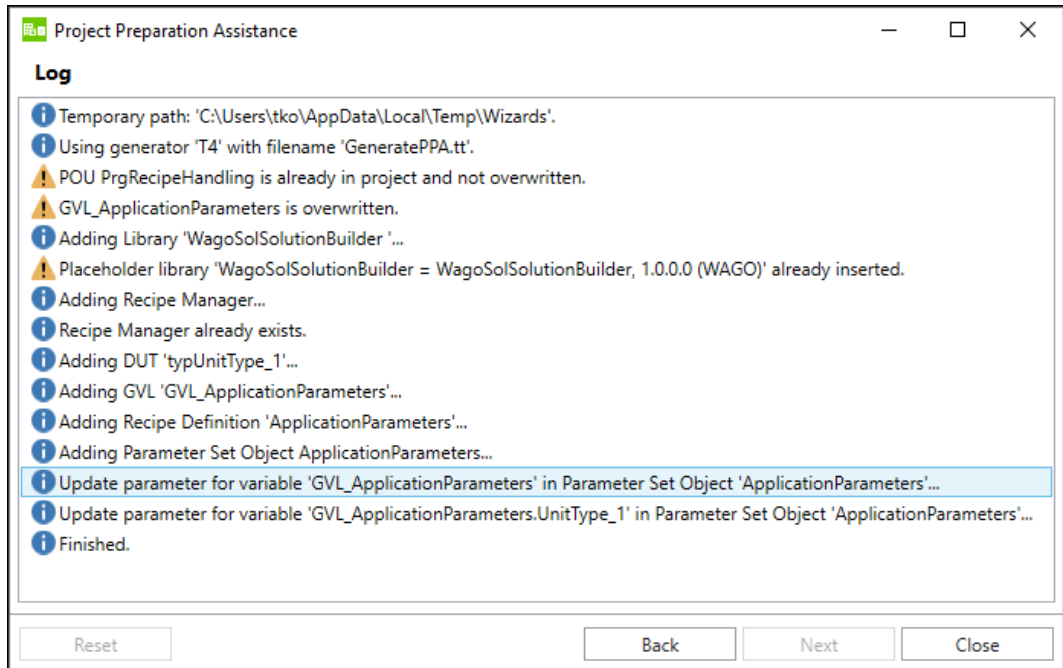


Figure 149: IEC Development Environment: "Log" Application Wizard Dialog

8.2.2.2 "Manager" Objects in the Program Structure

The "Managers" objects can be added to the project individually from the context menu once the WAGO Solution Builder Plug-in software is installed by right-clicking on the program structure tree in the development environment.

The device and project information from the configurators is then displayed in the workspace of the IEC Development Environment window. Double-clicking on one of the "Manager" objects opens a corresponding tab in the workspace.

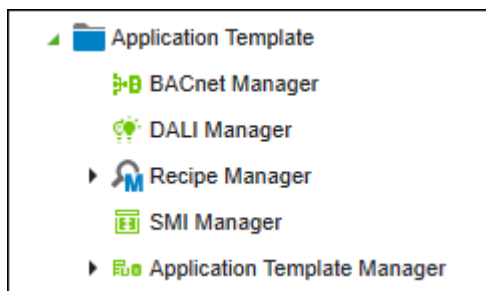








Figure 150: "Manager" objects in the program structure of a development environment

Icon	Designation	Description
	<p>BACnet Manager</p>	<p>A "BACnet Manager" object is added to the program structure to manage a WBC project file directly in the IEC Development Environment project.</p> <p>The WBC project file can be opened from the main menu via the [Open in WAGO BACnet Configurator] button. Digital and analog channels of the hardware modules or logical BACnet objects can be imported. All commands in the main menu always refer to the active application. When you close the configurator, the "BACnet Manager" object is synchronized with any changes you made, and the corresponding program code is then generated.</p> <p>The object editor displays a list of the BACnet objects in the project in the workspace.</p> <p>Note: Note that the name of the controller in the IEC development environment project must match the device name in the WBC project file. The name is applied automatically when data is imported into the WBC project file. If you change one of these names at a later time, the other name must also be changed.</p>
	<p>DALI Manager</p>	<p>A "DALI Manager" object is added to the program structure to manage a WDC project file directly in the IEC Development Environment project.</p> <p>The WDC project file can be opened in the ribbon via the [Open in WAGO DALI Configurator] button. All commands in the main menu always refer to the active application. When you close the configurator, the "DALI Manager" object is synchronized with any changes you made.</p> <p>The object editor displays statistics about the project content in the workspace.</p>
	<p>Formula Manager</p>	<p>The Formula Manager is a component of the IEC Development Environment and is used to manage formula definitions.</p> <p>Right-clicking on "Formula Manager" opens the "Add New Item" context menu. A new "Formula Definition" can be added here.</p> <div data-bbox="807 1256 1031 1413" style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>Add a new item:</p> <ul style="list-style-type: none">  Folder  Recipe Definition </div> <p>Detailed information is available in the manual of the IEC Development Environment.</p>
	<p>SMI Manager</p>	<p>An "SMI Manager" object is added to the program structure to manage a WSC project file directly in the IEC Development Environment project.</p> <p>The WSC project file can be opened in the main menu via the [Open in WAGO SMI Configurator] button. All commands in the main menu always refer to the active application. When you close the configurator, the "SMI Manager" object is synchronized with any changes you made.</p> <p>The object editor displays statistics about the project content in the workspace.</p>

Icon	Designation	Description
	Application Template Manager	<p>The Application Template Manager is used to create application templates and contains all properties, as well as the functional structure and parameter set objects of an application.</p> <p>Right-clicking on Application Template Manager opens the "Add New Item" context menu. Here you can add a new WAGO Parameter Set Object.</p>



8.2.2.2.1 BACnet Manager

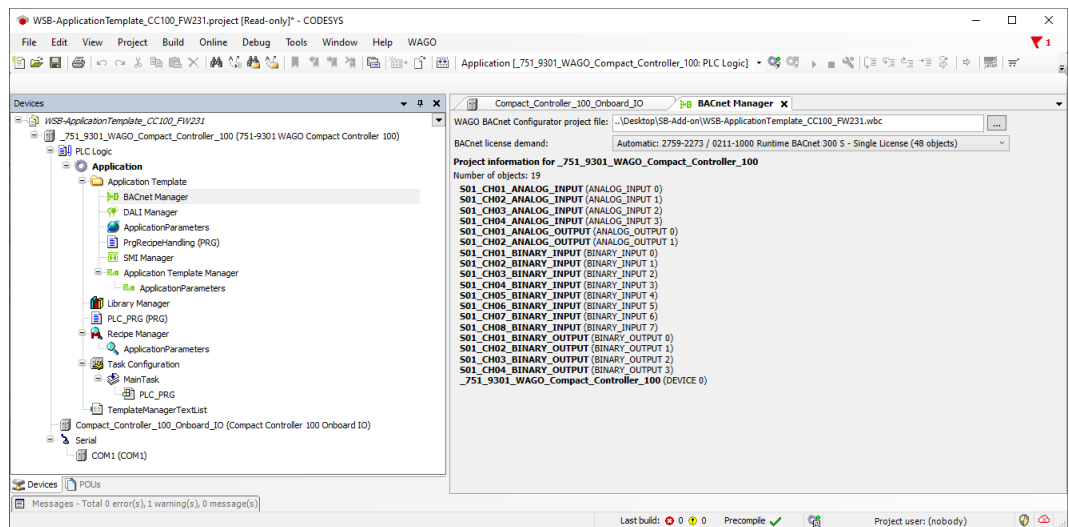


Figure 151: IEC Development Environment: BACnet Manager Program Structure and Workspace

BACnet Workspace

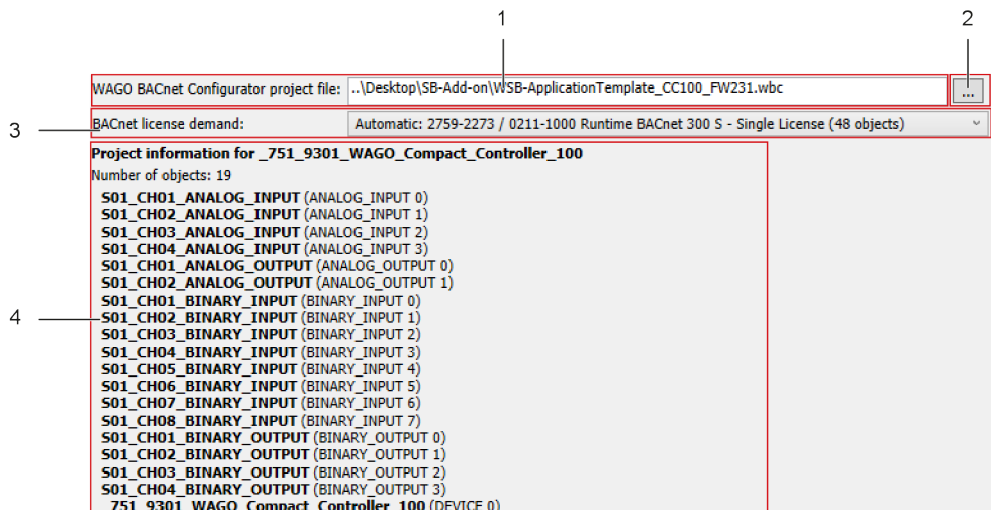

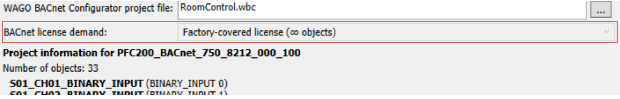
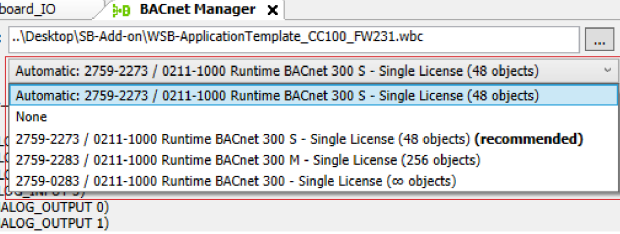


Figure 152: IEC Development Environment: BACnet Manager Workspace

Position	Designation	Description
1	Project file for WAGO BACnet Configurator	Option for entering the path to the BACnet Configurator project file with the extension *.wbc.

Position	Designation	Description
2	File Selection	 Opens a dialog for selecting the BACnet Configurator project file.
3	Required BACnet License	<p>For BACnet controllers (item number 0750-8212/0000-0100), no selection is possible at this point.</p>  <p>If no BACnet controller is used, a BACnet license can be selected here.</p> <p>If a BACnet license has already been purchased, the object volume of the existing license can be selected here.</p> <p>If no license exists yet, a license recommendation appears based on the current project.</p>  <p>Note: The WAGO "Licensing" add-on is required for recognizing BACnet licenses and receiving license recommendations (see Require-ments > 12).</p>
4	Device Information for xxx from Project File	<p>Shows a summary of the contents of the selected BACnet project.</p> <p>The total of all BACnet objects and a list of all objects are shown.</p>

8.2.2.2 DALI Manager

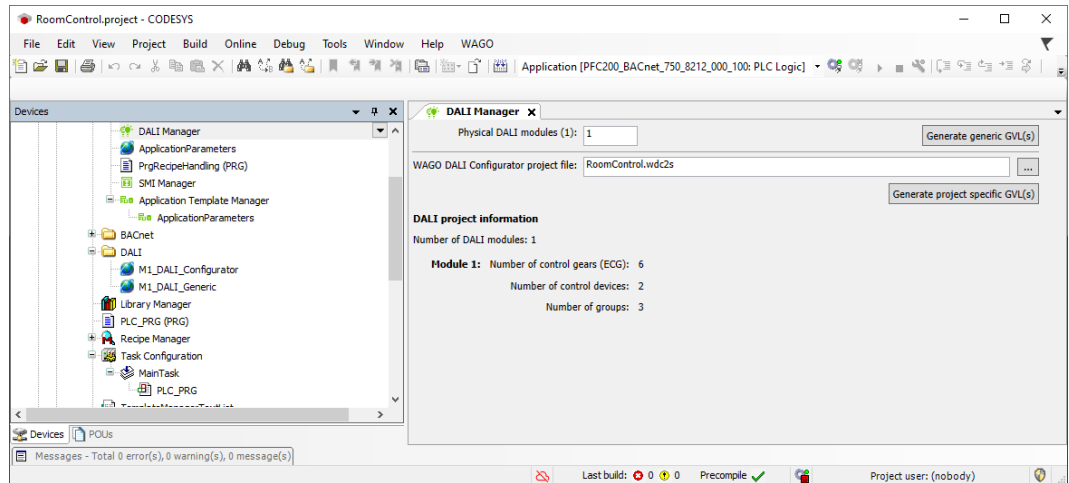


Figure 153: IEC Development Environment: DALI Manager Program Structure and Workspace

DALI Workspace

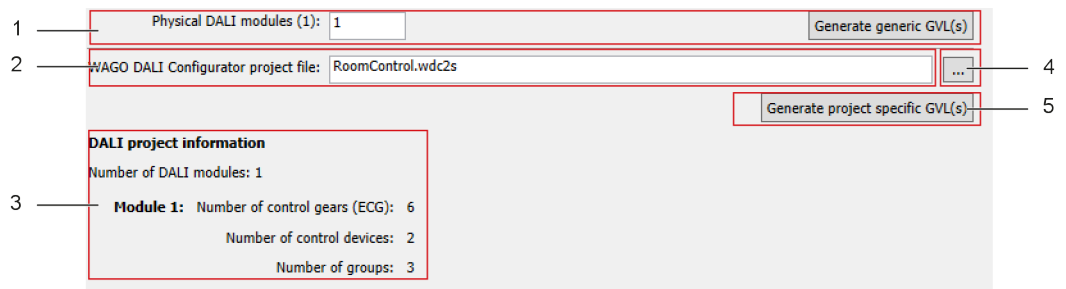


Figure 154: IEC Development Environment: DALI Manager Workspace

Position	Designation	Description
1	Physical DALI Modules	Displays and allows you to enter the number of physical DALI modules in the hardware configuration for the application used.
	[Generate Generic GVL(s)]	Generates a generic global variable list (program code) for using DALI in the IEC application.
2	Project File for WAGO DALI Configurator	Option for entering the path to the DALI Configurator project file with the suffix *.wdc2c.
3	DALI Project Information	Shows a summary of the contents of the selected DALI project. A list of all the implemented DALI devices appears.
4	File Selection	Opens a dialog for selecting the DALI Configurator project file.
5	[Generate Project-Specific GVL(s)]	Generates a project-specific global variable list (program code) for using DALI in the IEC application.

8.2.2.2.3 SMI Manager

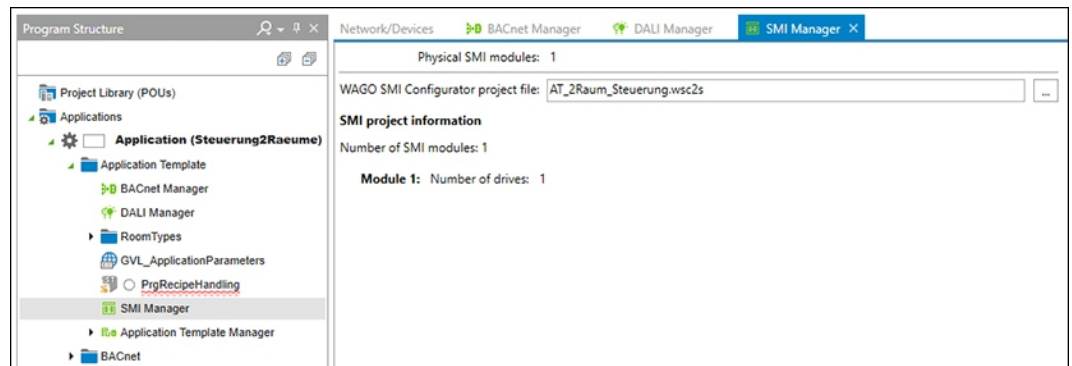


Figure 155: IEC Development Environment: SMI Manager Program Structure and Workspace

SMI Workspace

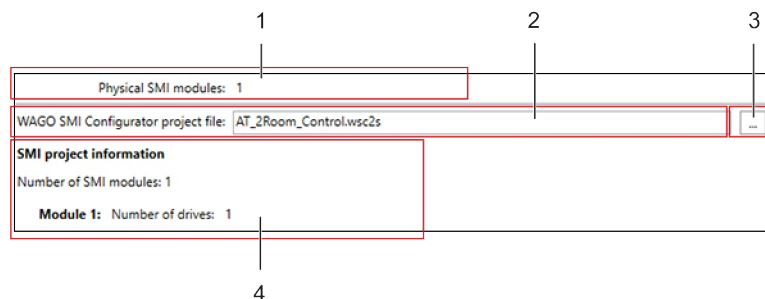


Figure 156: IEC Development Environment: SMI Manager Workspace

Position	Designation	Description
1	Physical SMI Modules	Shows the number of physical SMI modules in the hardware configuration of the application used.
2	Project File for WAGO SMI Configurator	Option for entering the path to the SMI Configurator project file with the suffix <i>*.wdc2c</i>
3	SMI Project Information	Shows a summary of the contents of the selected SMI project. A list of all the implemented SMI drives appears.
4	File Selection	<input type="text" value="..."/> Opens a dialog for navigating to the SMI Configurator project file

8.2.2.2.4 Formula Manager

To create an application template the settings in the Formula Manager in the tab "Storage" must meet the following specifications to fulfill the necessary requirements.

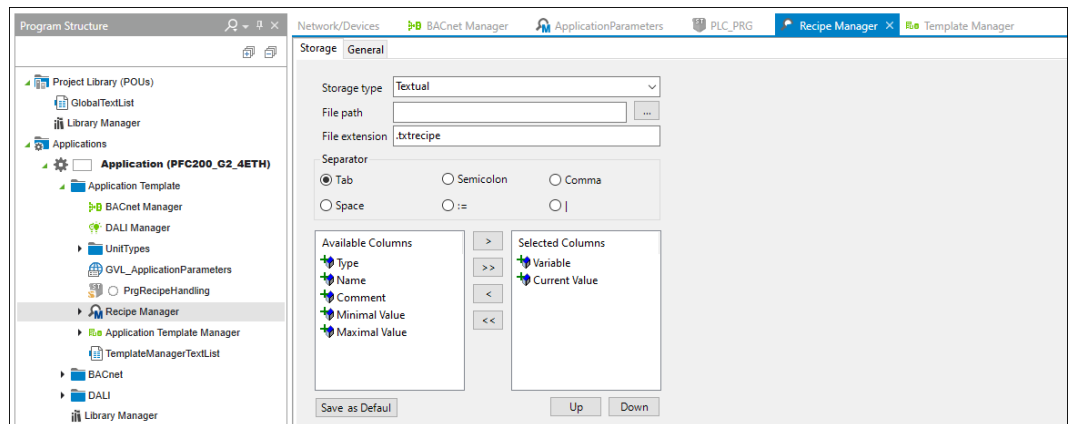


Figure 157: IEC Development Environment: Program structure and workspace of the formula manager

8.2.2.2.4.1 "Storage" Tab

The following settings are required for creating an application template.

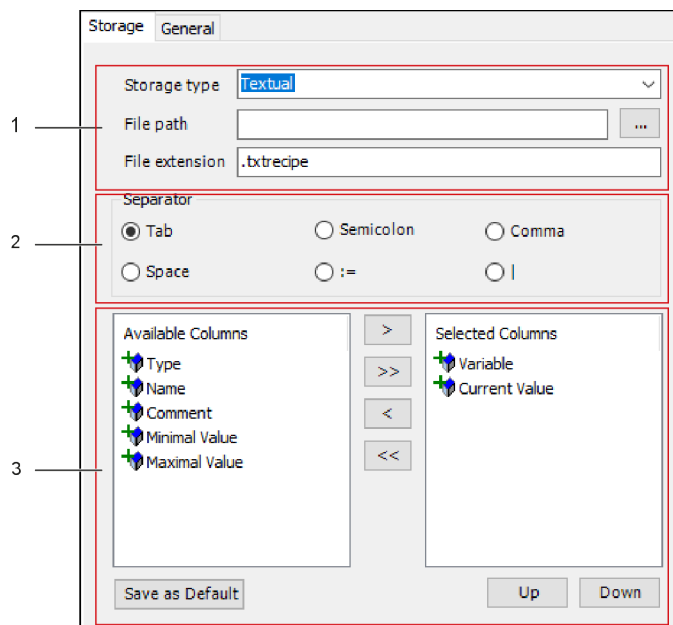


Figure 158: IEC Development Environment: Workspace of the Formula Manager > "Save" Tab

Position	Designation	Required Setting	
1	Type of storage	Textual	
	File Path	Blank or ./.	
	File extension	.txtrecipe	
2	Delimiter	Tab	
3	Column selection	Selected columns	Variable
			Current Value

8.2.2.2.4.2 "General" Tab

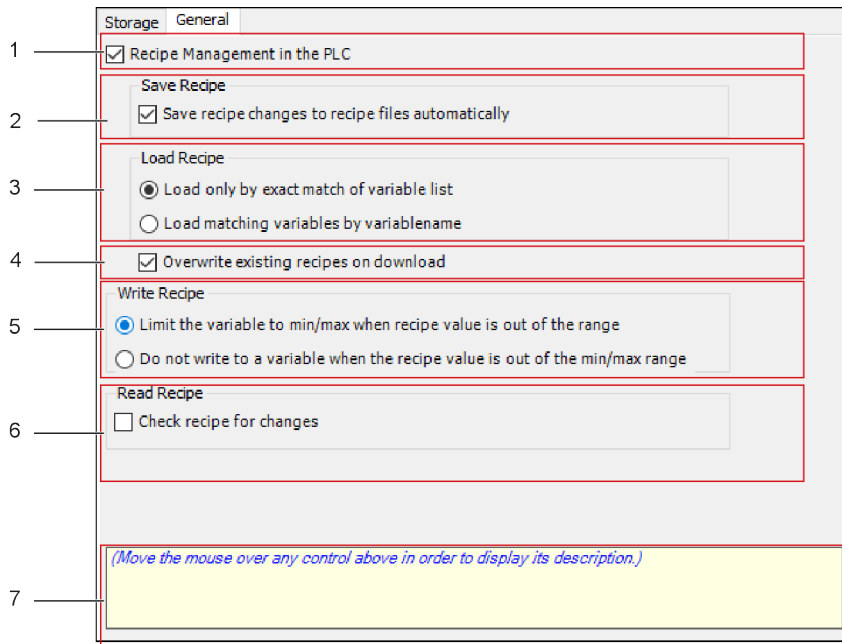


Figure 159: IEC Development Environment: Workspace of the Formula Manager > "General" Tab

Position	Designation	Description
1	Formula Management in the PLC	<input type="checkbox"/> Disables the following options: "Save Formula," "Load Formula" and "Overwrite Existing Formula on Download."
		<input checked="" type="checkbox"/> A POU (Programming Organization Unit) is created in the run-time system for formula management.
2	Save Formula	<input type="checkbox"/> Does not automatically save changes.
		<input checked="" type="checkbox"/> Automatically saves formulas to a file after a change.
3	Load Formula	<input checked="" type="radio"/> Loads a formula file only if it contains all the variables from the list of variables of an application's formula definition.
		<input checked="" type="radio"/> All matching variable names are loaded from the formula file. Note: No notification is given if there are differences between the formula file and the formula definition of an application.
4	Overwrite Existing Formulas on Download	<input type="checkbox"/> Existing formulas are not overwritten when a new application is initialized.
		<input checked="" type="checkbox"/> Existing formulas may be overwritten when a new application is initialized.
5	Write Formula	

Position	Designation	Description
	Limit Variable to Min/Max If Formula Outside Range	<input checked="" type="radio"/> If the formula contains a value outside the value range entered in the definition, the specified minimum or maximum value is written to the PLC variable instead of this value.
	Do Not Write Variable If Formula Outside Min/Max Range	<input checked="" type="radio"/> If the formula contains a value that is outside the value range entered in the definition, no value is written to the PLC variable. It retains its current value.
6	Check Formula for Changes	<input type="checkbox"/> Formula is saved without additional checks.
		<input checked="" type="checkbox"/> Generates additional code to save a formula only if it is changed by using "ReadAndSaveRecipe."
7	Tooltips	Moving the mouse over one of the elements listed above causes an additional tooltip to appear at this point.

8.2.2.2.5 Application Template Manager

An Application Template Manager object is used to create application templates. It allows configuration of the application template managers' metadata and contains parameter set objects. The Application Template Manager is divided into four tabs:

- "General" Tab
- "Functional Structure" tab
- "Dependencies" Tab
- "Files" Tab

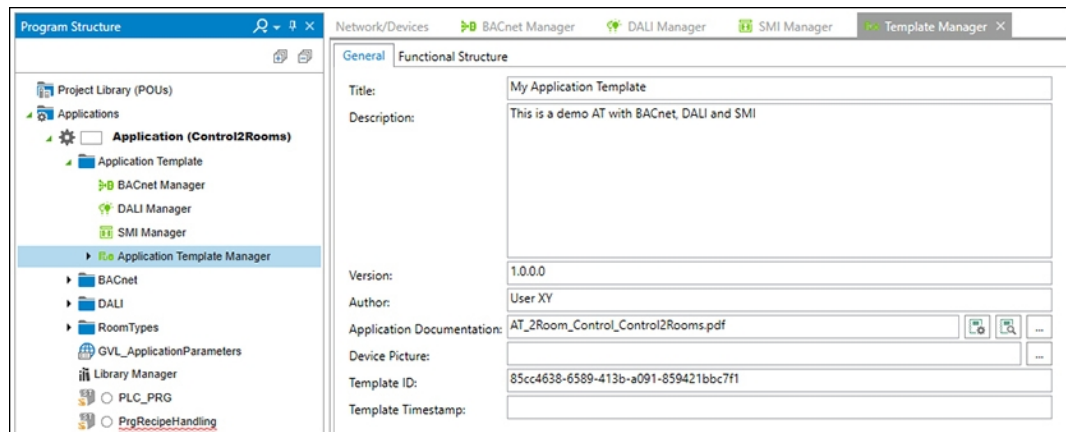


Figure 160: IEC Development Environment: Program Structure and Workspace of the Application Template Manager

8.2.2.2.5.1 "General" Tab

The "General" tab contains fields for describing the application template.

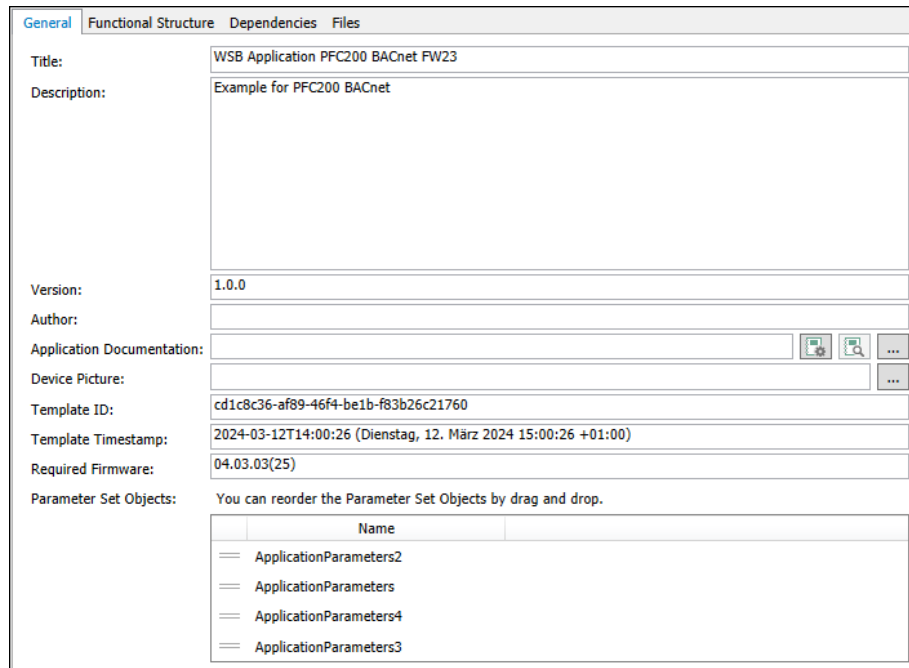











Figure 161: IEC Development Environment: Application Template Manager Workspace > "General" Tab

Designation	Description						
Title	Here you can enter the title of the application template. The title is also used as a name in the WAGO Solution Builder software.						
Description	Here you can enter a description of the application template. The description might, for example, describe the function of the application or document changes that have been made.						
Version	Optional field: Shows the version of the application template. This field is only displayed by the WAGO Solution Builder software, not evaluated.						
Author	Optional field: Here you can enter the name of the application template developer.						
Application Documentation	<p>Optional field: Here you can save documentation for the application as a PDF document.</p> <p><i>Example:</i> One possible example for saved documentation is the documentation for the program code of an application.</p> <table border="0"> <tr> <td></td> <td>Generate Application Documentation Automatically generates the project documentation from the IEC development environment as a PDF document. The PDF document is attached to the application template.</td> </tr> <tr> <td></td> <td>Open Application Documentation Opens the attached PDF documentation.</td> </tr> <tr> <td></td> <td>Opens a dialog for navigating to whatever PDF document you want to attach as documentation. This serves as an alternative to the project documentation generated by the IEC development environment used.</td> </tr> </table>		Generate Application Documentation Automatically generates the project documentation from the IEC development environment as a PDF document. The PDF document is attached to the application template.		Open Application Documentation Opens the attached PDF documentation.		Opens a dialog for navigating to whatever PDF document you want to attach as documentation. This serves as an alternative to the project documentation generated by the IEC development environment used.
	Generate Application Documentation Automatically generates the project documentation from the IEC development environment as a PDF document. The PDF document is attached to the application template.						
	Open Application Documentation Opens the attached PDF documentation.						
	Opens a dialog for navigating to whatever PDF document you want to attach as documentation. This serves as an alternative to the project documentation generated by the IEC development environment used.						
Device Image	Optional field: Here you can enter a path to a graphic to use as the image for the application template.						

Designation	Description
	<div style="border: 1px solid gray; padding: 2px; width: 20px; text-align: center;">...</div> Opens a dialog for navigating to a graphics file in order to attach it to the application template.
Template ID	Here you can enter a unique application template ID. The WAGO Solution Builder software identifies the application template on the basis of this ID. If you want to edit an existing application template, a new application template ID must not be generated; the existing ID must remain constant. If a new application template or a separate version is created that the WAGO Solution Builder software recognizes as a separate application template, you can right-click on the template and use the context menu to generate a new ID.
Template Timestamp	Shows the timestamp for when the application template was last exported.
Required Firmware	Shows the required firmware version of the controller.
Parameter Set Objects	Shows a list of existing Parameter Set objects and allows them to be sorted with drag-and-drop gestures. The order defined here is carried over to the WAGO Solution Builder software.

8.2.2.2.5.2 "Functional Structure" Tab

You can use the "Functional Structure" tab to optionally populate the Application template with a data model based on an addressing system. The data model describes data points of the application template and their functional relationships in a hierarchical structure, e.g., BACnet objects or hardware I/O.

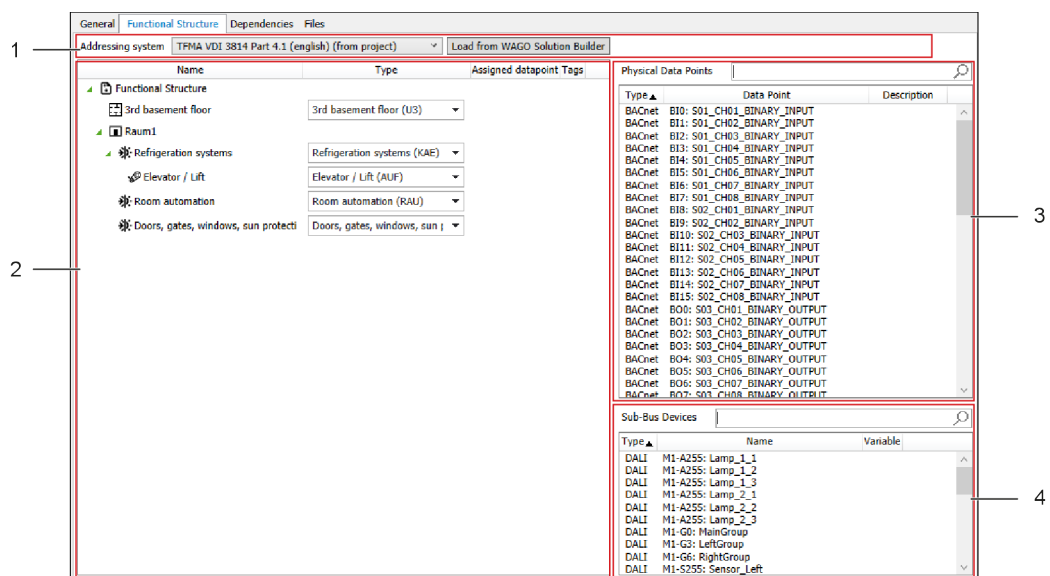


Figure 162: IEC Development Environment: Application Template Manager Workspace > "Functional Structure" Tab

Position	Designation	Description
1	Addressing system	Here you can display and select the addressing system. Note: The addressing system can also be selected with the context menu (see "Functional Structure" Contextual Menu [p. 146]). [Loading WAGO Solution Builder] Loads the addressing systems from Solution Builder and provides them in the drop-down menu.

Position	Designation	Description
2	Functional Structure	<p>Here you can configure the functional structure.</p> <p>Based on the selected addressing system, you can then set up a structure tree, starting from any level that ends with items of type "Data Point."</p> <p>Right-clicking on an existing structural element opens a context menu; see "Functional Structure" Contextual Menu [p. 146] below.</p> <p>Note: Data points shown in red are not in the project.</p> <p><i>Example:</i></p> <p>Assuming an Application template can control up to eight rooms, then eight individual trees are created here, beginning at the "Room" level, and these trees assign the data points to the corresponding rooms.</p> <p>To link BACnet objects or hardware I/Os to data points, drag a data point from the "Physical Data Points" area and drop it on a data point in the "Functional Structure" area.</p>
3	Physical Data Points	<p>Displays a list of BACnet objects and hardware I/O that have not yet been assigned to a data point.</p> <p>Note: The full-text search field above the list can be used for searching within the list.</p>
4	Sub-Bus Devices	<p>Displays a list of all sub-bus devices implemented in the Application template being used.</p> <p>Note: The full-text search field above the list can be used for searching within the list.</p>

8.2.2.2.5.2.1 "Functional Structure" Contextual Menu

Right-clicking on an existing structure item in the "Functional Structure" tab opens the following contextual menu.

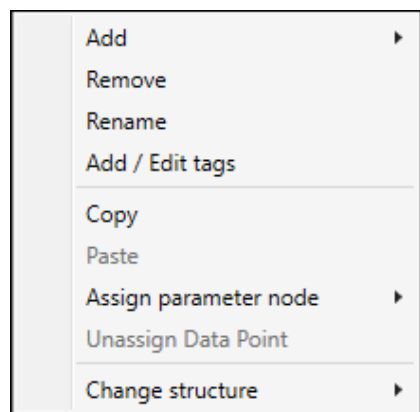
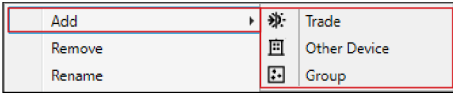
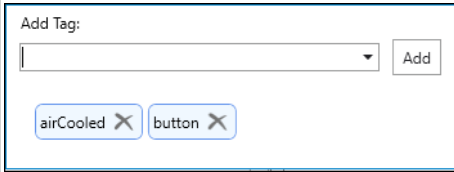
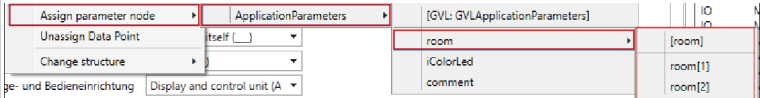
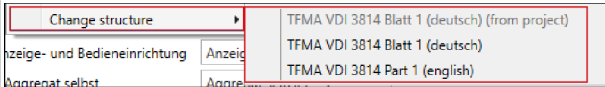


Figure 163: Application Template Manager > "Functional Structure" Tab > Workspace > Context Menu

Menu Item	Description
Add	<p>Adds a structural element.</p> <p>The submenu contains all the elements from the addressing system allowed at this point (structure definition).</p> 
Remove	Deletes the selected structural element.
Rename	<p>Changes the name of the selected structural element.</p> <p><i>Alternative option:</i></p> <p>In the "Name" column, left-click on the structural element you want.</p>
Add/Edit Tags	<p>Adds new tags and/or removes existing ones.</p>  <p><i>Alternative option:</i></p> <p>Left-click in the "Tags" column.</p>
Copy	Copies the selected structural element(s) to the clipboard.
Paste	Pastes the structural element from the clipboard.
Assign Parameter Nodes	<p>Selects a structure variable (parameter node) from a Parameter Set Object (PSO) and assigns it to the structural element as a data point.</p> <p>The structure of the context menu corresponds to the structure of the Parameter Set Object. The menu item with square brackets is used to select the higher-level variable.</p>  <p>Once parameter nodes have been assigned, only the specific variable content appears in the WAGO Solution Builder software.</p>
Cancel Data Point Assignment	Removes the link between the physical data point and the data point in the functional structure.
Modify Structure	<p>Switches to a different addressing system (structure definition).</p> <p>The addressing systems that come standard are displayed.</p> <p>This function can also be used in case the addressing system is changed to a newer version. The project saves the addressing system used up to this point. If a new addressing system is provided via the WAGO Solution Builder Plug-in software, you can use this menu item to update the addressing system to the new version.</p> 

8.2.2.2.5.3 "Dependencies" Tab

An Application template can be based on specific software packages, provided these are installed on the controller. The dependencies for third-party software can be defined here.

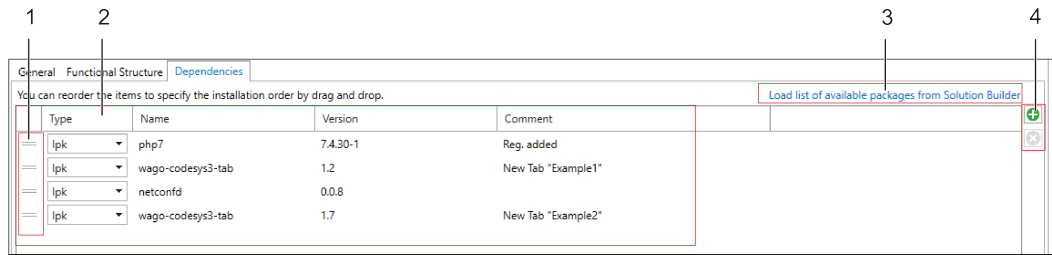


Figure 164: IEC Development Environment: Application Template Manager Workspace > “Dependencies” Tab

Position	Designation	Description
1	≡	Used for sorting entries. Entries can be sorted individually by dragging them with the mouse. The order of the sorted entries determines the installation order.
2	Type	Shows the package type. The following package types are available: <ul style="list-style-type: none"> ▪ IPK ▪ Docker
	Name	Shows the name of the package. The selection list offers package names provided by Solution Builder.
	Version	Shows the required version number of the package. If a package that has been transferred by Solution Builder is entered under “Name,” a list of known version numbers is also listed here in the selection list. If no specific version is specified, WSB will use the most recent available version later during installation.
	Comments	Here you can enter individual comments, e.g., information about the scope of functions/applications of the package in the application.
3	Load List of Available Packages from WAGO Solution Builder	Loads the list of available packages.
4		Adds a new empty entry to the package list.
		Deletes the marked item. Multiple items can be selected.

8.2.2.2.5.4 “Files” Tab

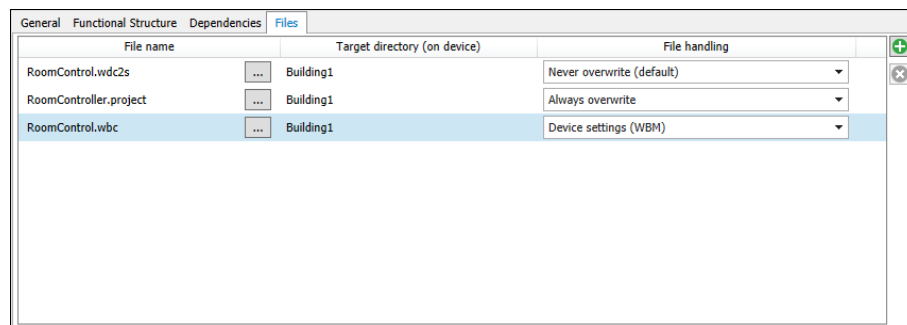

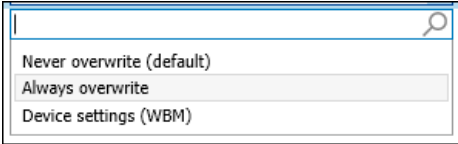


Figure 165: IEC Development Environment: Application Template Manager Workspace > “Files” Tab

Designation	Description
Filename	Option for selecting the file to transfer to the target device (controller). It can be selected with the button () or by entering it manually.
Target Directory (on the Device)	Option for entering the target directory on the target device (controller). If this field is empty, the file is copied to the <code>/home/codesys/PlcLogic</code> directory. Absolute paths can be entered. <i>Example:</i> <code>/etc/myfolder/logs</code> Path can also be relative to PlcLogic. <i>Example:</i> If "myfolder" is entered in the field, the file is saved to the <code>/home/codesys/PlcLogic/myfolder</code> directory.
File Handling	Option for selecting how the target device (controller) should handle the file. The following options are available: 
Never Overwrite	If a file already exists it is retained. The selected file is not transferred. This is the default behavior.
Always Overwrite	If a file with the same name already exists, this overwrites it. The selected file is always transferred.
Device Settings (WBM)	Changes settings of the target device (controller).

8.2.2.2.5.5 Application Parameters

Application parameters (**Parameter Set Objects**) are always linked to formula definitions from an IEC Development Environment. The naming of formula definitions is subject to the strict CODESYS rules (e.g., no spaces or special characters). Here however, you can rename the parameters and describe them in more detail. These settings will be visible later on the configuration screen of the corresponding application in the WAGO Solution Builder software.

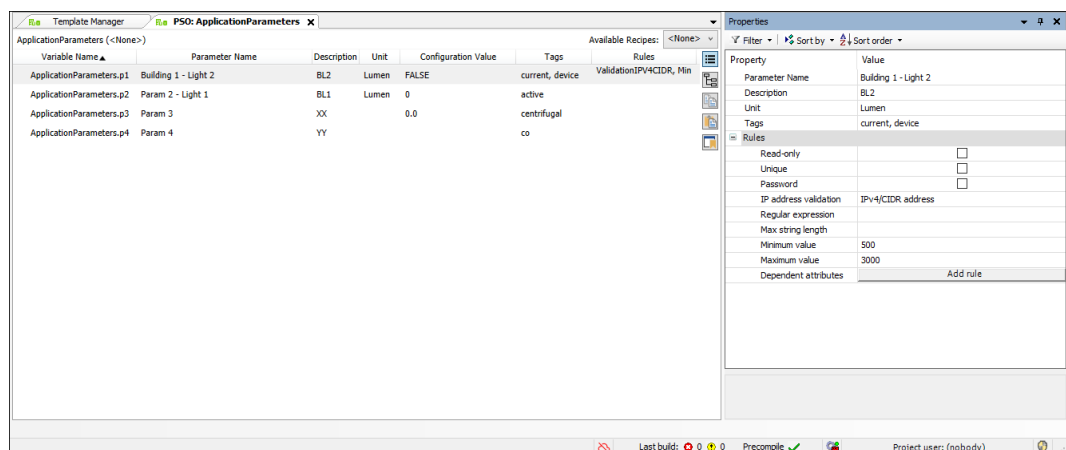
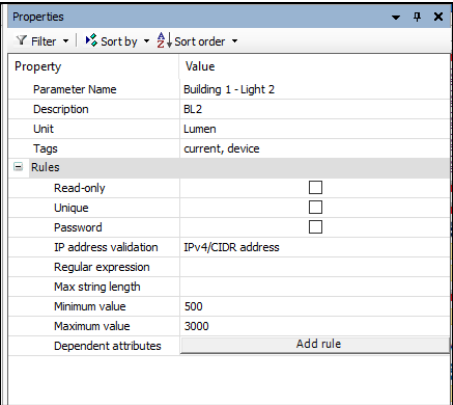


Figure 166: IEC Development Environment: Workspace of the Application Template Manager > Application Parameters

Designation	Description
Available Formulas	Here you can select a formula. Normally, the "<None>" selection is used.
Variable Name	Here you can display and edit the name of the parameter from the IEC Development Environment's formula definition.
Parameter Name	Optional field: Here you can view and edit the parameter name in the WAGO Solution Builder software. This field accepts special characters.
Configuration Value	Shows the value defined for a parameter in the program code or in the selected formula. <ul style="list-style-type: none"> Gray text: The value comes from the program code. Black text: The value comes from the formula selected under "Available Formulas." Note: If a formula is selected, but the value is still gray, the formula does not overwrite the value.
Description	Optional field: Here you can display and edit the description of the parameter in the WAGO Solution Builder software.
Tags	Optional field: Here you can display and edit the parameter tags. A selection list of all tags appears when the field is selected; any number of tags can be selected and thus assigned to a parameter.
Unit	Optional field: Here you can display and edit the physical unit of the parameter value.
Rule	Optional field: Here you can display and edit the parameter rules. When this field is selected, a Properties window opens in which rules can be selected or new rules created.  Note: The contents of the other columns for a parameter can also be edited in the properties window.

8.2.2.2.5.6 "WAGO Parameter Set Objects"

The "Add WAGO Parameter Set Object" dialog displays all the formula definitions in the project which have not yet been linked to a "WAGO Parameter Set Object." When you select a formula definition, you can use the **[Add]** button to create the associated "WAGO Parameter Set Object."

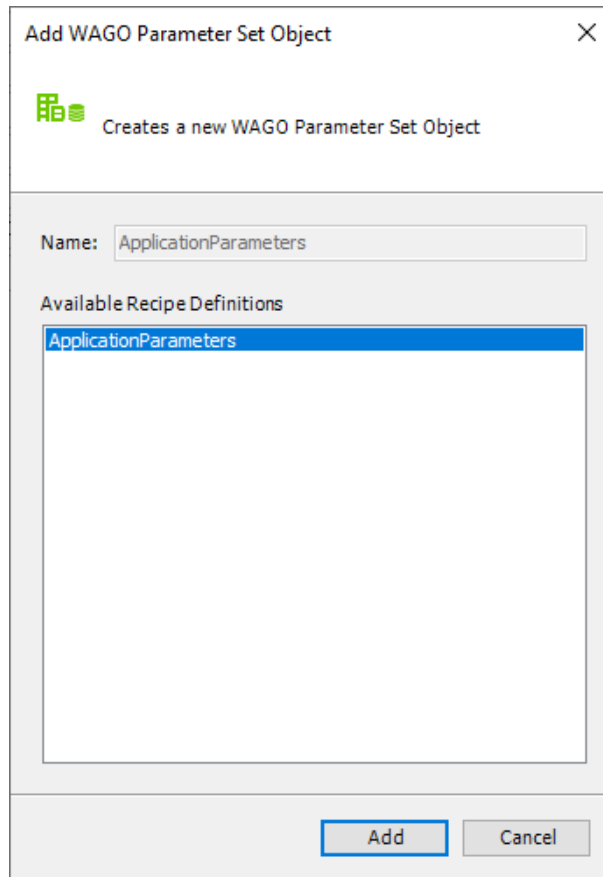


Figure 167: Program Structure of an IEC Development Environment > Application template > "Parameter Set Object" Context Menu > "Add WAGO Parameter Set Object" Dialog

9 Operation

This section describes the basic operation of the WAGO Solution Builder software based on typical application examples.

9.1 Create New Solution

A **solution** is the basic requirement for creating and building a customer project in the WAGO Solution Builder software. All the configuration actions require this initial step.

Therefore, this action step is described in the earlier section [Opening WAGO Solution Builder via Web Browser \[> 30 \]](#).

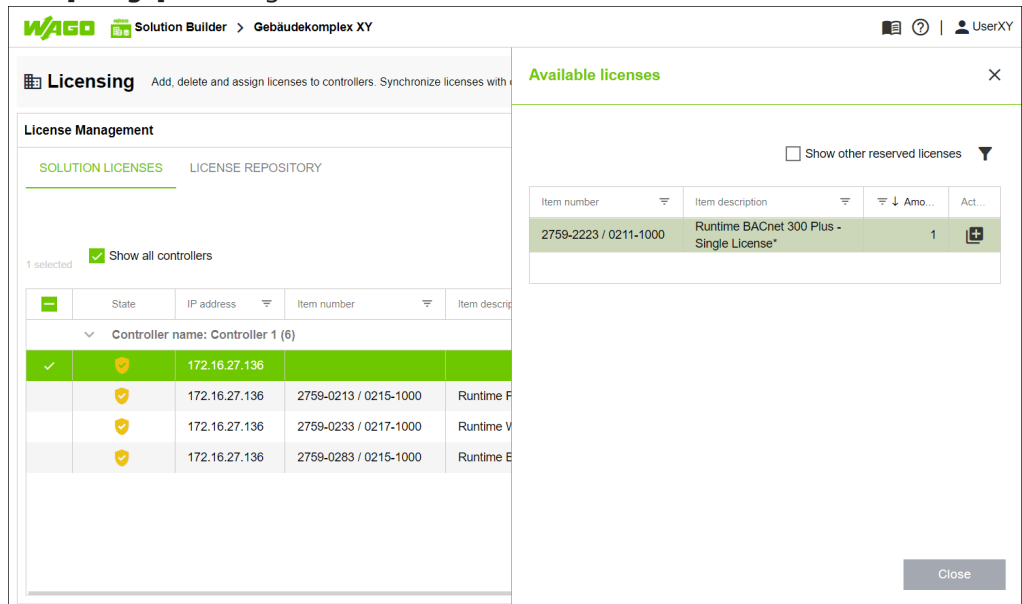
9.2 Adding Licenses and Assigning Them to a Created Controller

1. In the "Solutions" menu, click the "Configuration" menu item.
2. Create a "Controller" entity in the tree structure.

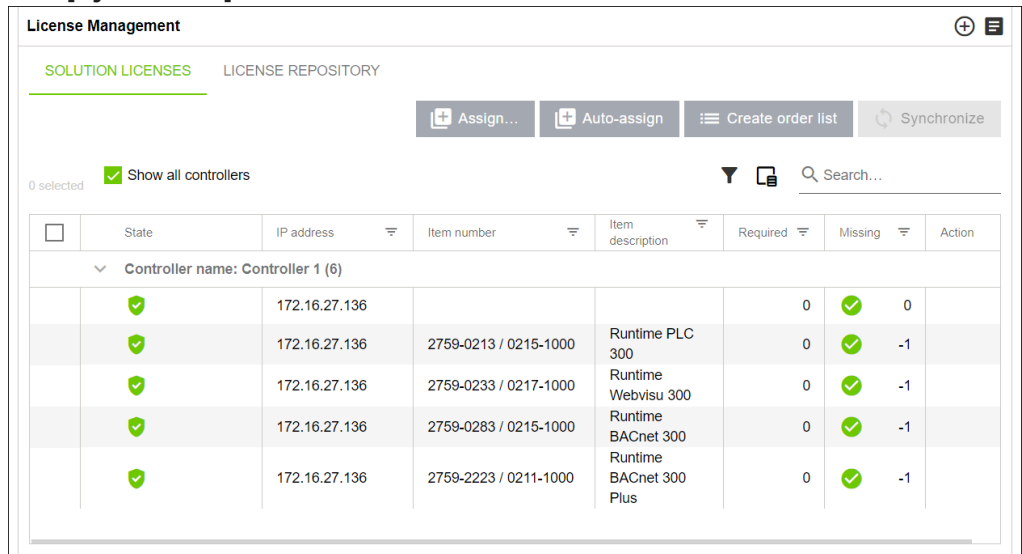


3. Select the "CONNECTION" tab.
4. Enter the IP address of your existing controller in the "IP Address" input field.
5. Click the "Licensing" menu item in the "Solutions" menu.
6. Select the "LICENSE REPOSITORY" tab.
7. Click **[Add Licenses]**.
8. Enter the licenses that you need for your project.
9. Click **[Add Licenses]**.
 - ⇒ The entered licenses are added to the license repository of the operating system being used and are then available in the WAGO Solution Builder software.
10. Click **[Check Connection]**.
 - ⇒ The WAGO Solution Builder software checks whether the WAGO license server can be reached via the Internet. If the license key is valid, the connection is established automatically.
11. Select the "SOLUTION LICENSES" tab.
12. Check the "Show All Controllers" box.

13. Select the corresponding controller.
14. Click **[Assign]** and assign the added licenses to the created controller.



15. Click **[Close]**.
16. Click **[Synchronize]**.

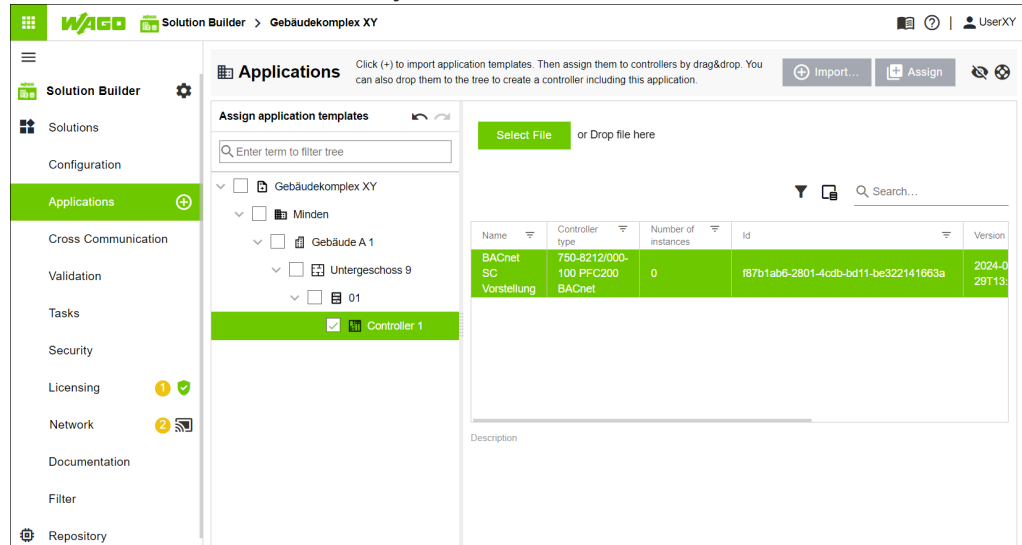


- ⇒ The license information is synchronized between the solution and the controller.
- ⇒ In the controller's Web-Based Management, the added licenses appear on the "Fieldbus" tab, "Status" menu item.

9.3 Adding an Application Template and Assigning It to a Created Controller

1. Click the "Application" menu item in the "Solutions" menu.
2. Click **[Select File]**.
3. Upload the preconfigured **application template**.

4. Select a created "Controller" entity in the tree structure.



5. Drag and drop the Application template onto the created "Controller" entity.
 - ⇒ The Application template is assigned to the "Controller" entity.

9.4 Adding an Entity to a Group

1. Select menu item "Configuration".
2. In the entity tree select an entity of type "Level" (see [Entity Tree \[► 40\]](#)). As an alternative you can also select a different entity that, as a subordinate child element, allows a "Group".
3. Click on **[Add child]** and select "Group".
 - ⇒ A new group is then created below the "Level" entity.
4. Select a group and in the "Properties" area click **[Freeze]**.
 - ⇒ The group properties are frozen and will be displayed until the function is deactivated.
5. Select the "GROUPS" tab.
6. In the entity tree select one or more entities of type "Controller" that you wish to add to the group.
7. Drag and drop the selected entities to "Group members".
 - ⇒ The entities are now part of the group.

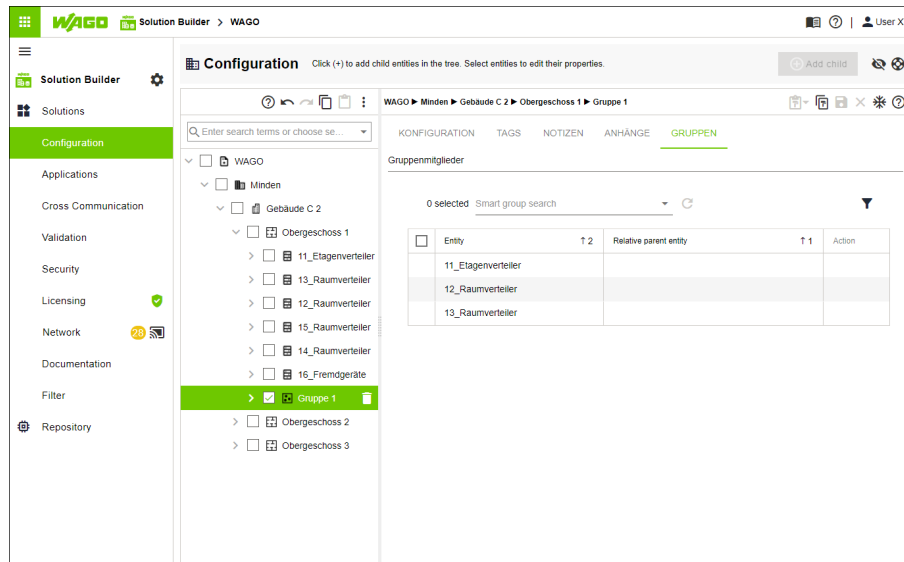


Figure 168: Add entity to a group

9.5 Configuring Cross-Communication

1. Select menu item "Cross-communication".
2. In the entity tree, select the "Controller" entity type that is to be defined as the "active controller" in cross-communication (see [Entity Tree \[> 40\]](#)).
3. Drag and drop the selected "Controller" entity to the "Controller" entity with which cross-communication is to be set up ("passive controller").
 - ⇒ Cross-communication had been configured between the entities.
 - ⇒ These entities are mapped as "active controller" and "passive controller" in the "Properties" area.

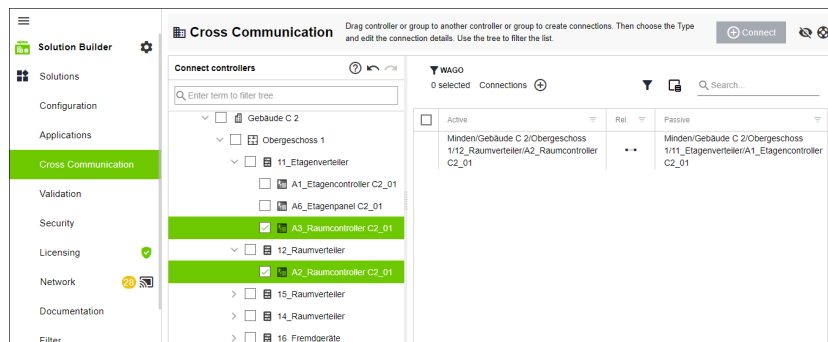


Figure 169: Configure cross-communication

9.6 Managing or Generating Certificates

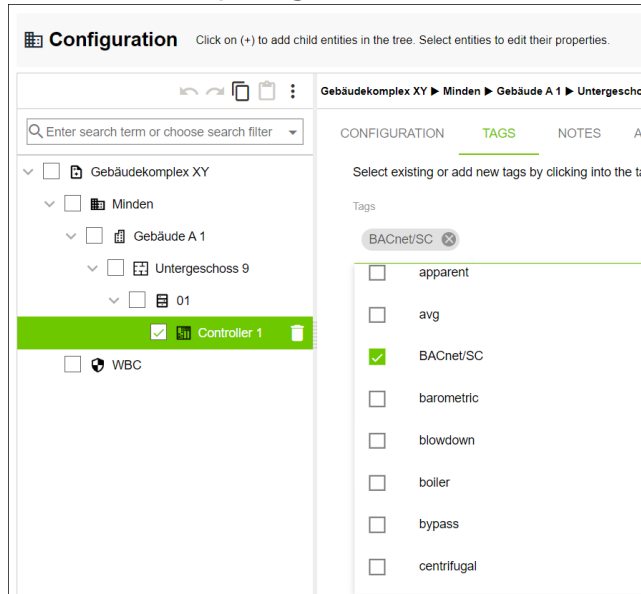
WAGO Solution Builder can be used to manage or generate all certificates. For this purpose, WAGO Solution Builder accesses the specific **etc/certificates** folder, which is factory installed on each controller. This folder contains all certificates with the name key **<common name>-server.crt** or **<common name>-ca.crt**.

The contents are mirrored on the ["CERTIFICATES" Tab \[> 75\]](#) when WAGO Solution Builder synchronizes with the corresponding controller. WAGO Solution Builder performs a plausibility check, so it only displays certificates with a correct name key.

These certificates can then be managed further in WAGO Solution Builder.

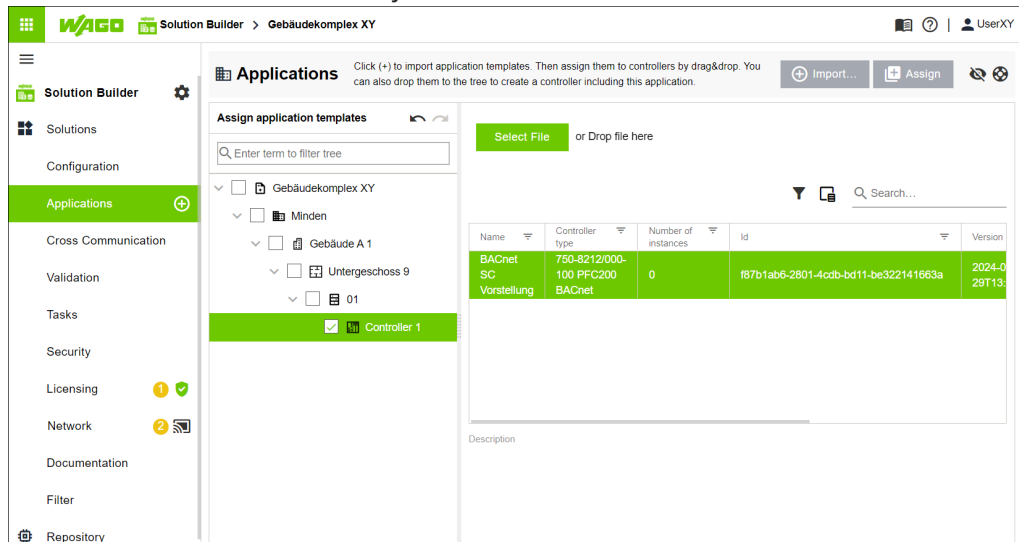
9.6.1 Managing BACnet/SC Certificates

1. Create a "Controller" entity in the tree structure.
2. Click the "TAGS" tab.
3. Select the **BACnet/SC** tag.



⇒ The selected tag is assigned to the "Controller" entity.


4. Click the "Application" menu item in the "Solutions" menu.
5. Click **[Select File]**.
6. Upload the preconfigured **application template**.
7. Select a created "Controller" entity in the tree structure.



8. Drag and drop the Application template onto the created "Controller" entity.

⇒ The Application template is assigned to the "Controller" entity.


9. In the "Solutions" menu, click the "Configuration" menu item.
10. Select a created "Controller" entity in the tree structure.

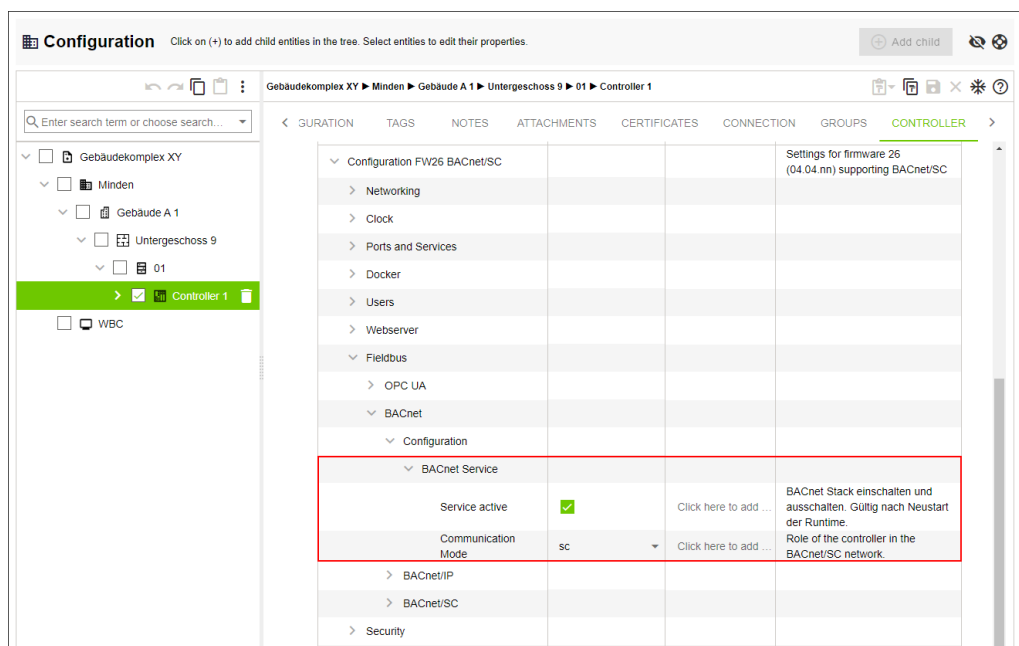
11. Click the "CONTROLLER" tab.
12. Open "Controller Details" > "Device Details."
13. Edit the input fields for the selected controller.
14. Click .
15. Open "Controller Details" > "WBM."

Note

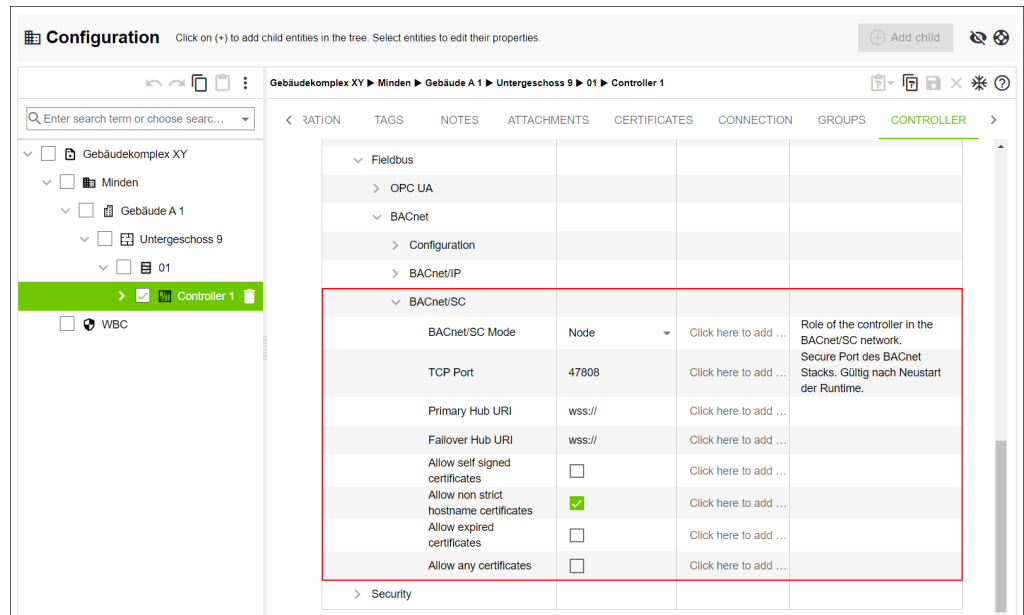
Configuration for "WBM" only available if input fields are edited under "Device Details"!

The following settings for "WBM" require you to have filled in all the input fields under "Device Details" and saved the settings you have made. If you have not, the settings for "WBM" are not available and are not displayed!

16. Click .
 - ⇒ The device model is reloaded, and all linked device instances are updated.
17. Open "Controller Settings" > [...] > "BACnet Service."
18. Check the "Service Active" box.
19. Select the **sc** setting in the "Communication Mode" field.

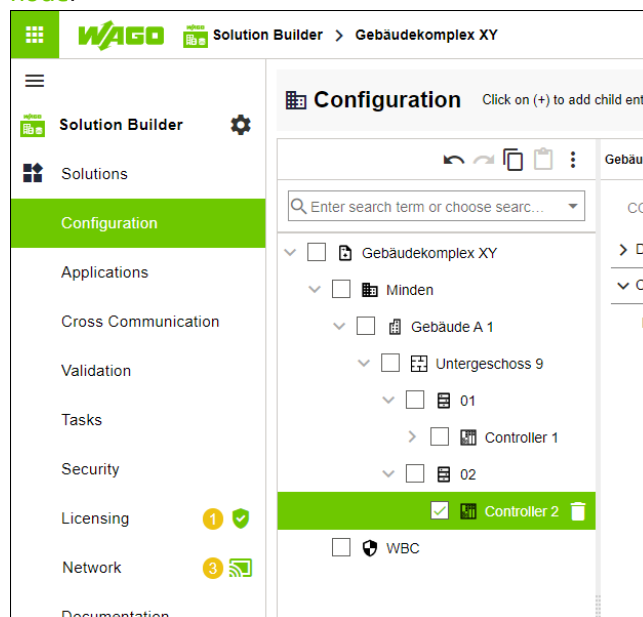


20. Open "Controller Settings" > [...] > "BACnet/SC" and then create a **BACnet/SC hub**.
21. Select the **Primary Hub** setting under "BACnet/SC Mode."
22. Enter port number **47808** in the "TCP Port" field.
23. Enter the corresponding URI in the "Primary Hub URI" input field.
The entry must have the following structure: `wss://XXX.XXX.XXX.XXX:YYYYY`.
Example: If the hub is to be reached at IP address `192.168.178.19` and port `47809` is selected for communication, the entry should be as follows: `wss://192.168.178.19:47808`.
24. Enter the corresponding URI in the "Failover Hub URI" input field.
The entry must have the following structure: `wss://XXX.XXX.XXX.XXX:YYYYY`.
Example: If the hub is to be reached at IP address `192.168.178.19` and port `47809` is selected for communication, the entry should be as follows: `wss://192.168.178.19:47808`.



25. Click **[Save]**.

26. Repeat the steps for the second controller (Controller 2). Configure it as a **BACnet/SC node**.



27. Select the "Property" entity in the tree structure.

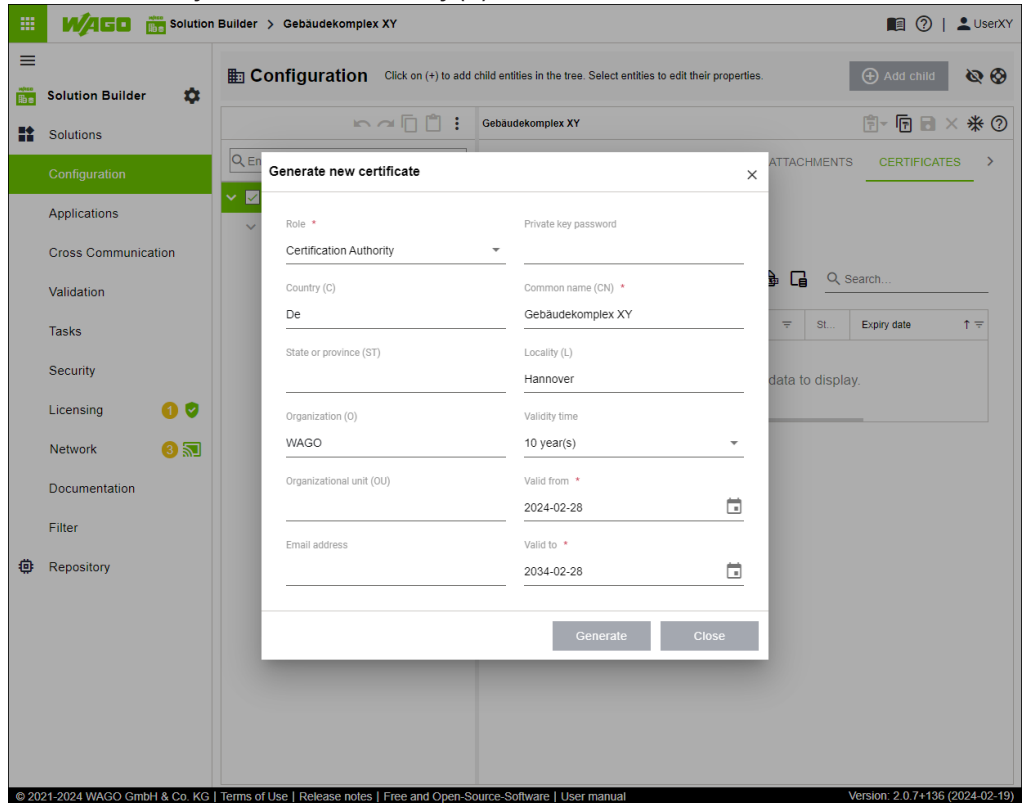
28. Click the "CERTIFICATES" tab.

29. Click **[+]** to create a new certificate.

⇒ The "Generate New Certificate" dialog opens.

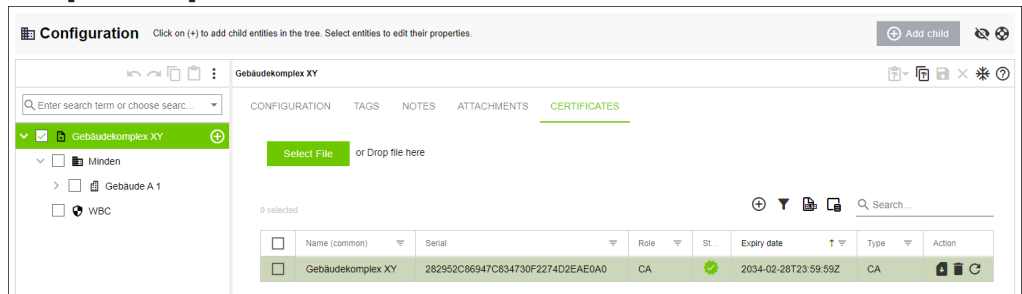
30. Select **Certificate Authority** from the "Role" drop-down menu.

31. Enter the country name in the "Country (C)" field.



⇒ The form's remaining input fields are filled in automatically.

32. Click **[Generate]**.



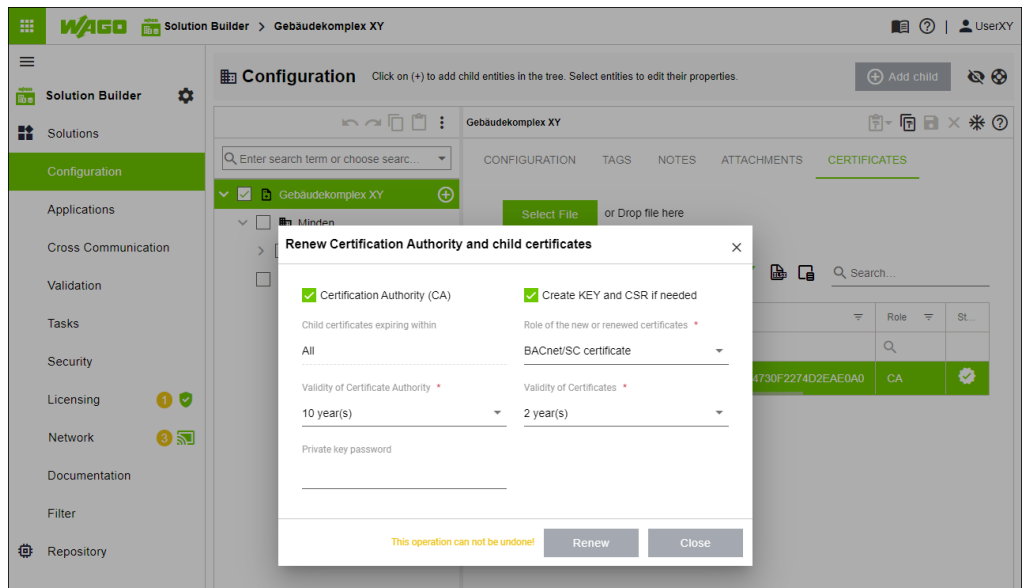
⇒ WAGO Solution Builder generates a **private key** and CA security certificate for itself. These can then be used to sign device certificates.

33. Click **[Update]**.

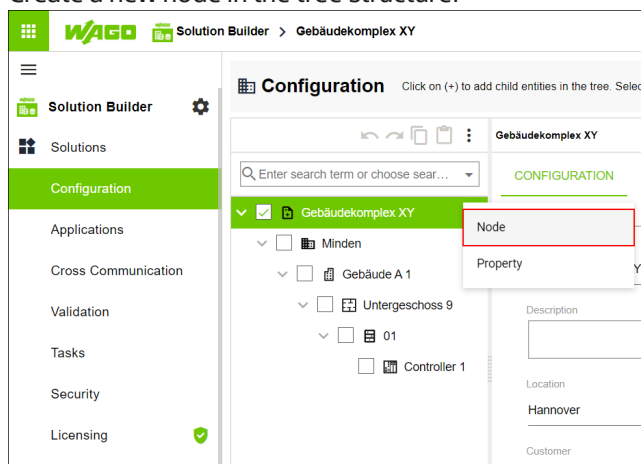
⇒ The "Renew Certificate Authority and Subcertificates" dialog opens.

34. Select **All** from the "Subcertificates Expire within" drop-down menu.

35. Select the **BACnet/SC certificate** from the “Role of New or Renewed Certificates” drop-down menu.



36. Click **[Renew]**.
37. Create a new node in the tree structure.



38. Rename this node “WBC.”
39. Click the “CONNECTION” tab.
40. Enter the IP address of your PC in the “Device Address” field.

⇒ The certificate is stored under the IP address you enter.

Note Only use the IP address of the PC!

Only enter the IP address of your PC so WAGO BACnet-Konfigurator and all other WAGO software components in your network can also access the certificate you have created. Alternatively, you can also enter the domain name “localhost.”

41. Click the “CERTIFICATES” tab.
 42. Click **[+]** to create a new certificate.
- ⇒ The “Generate New Certificate” dialog opens.
43. Create a “BACnet/SC certificate” as in the previous steps.

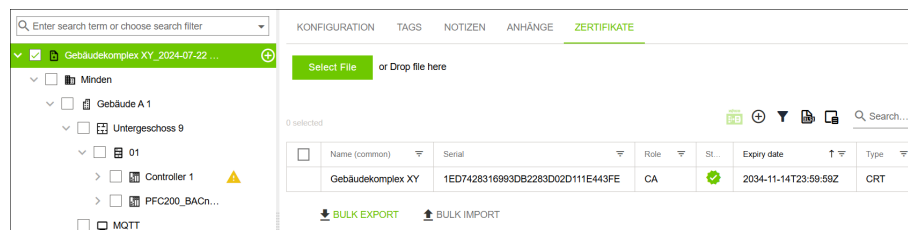
44. Select a created "Controller" entity in the tree structure.
45. Click the "CERTIFICATES" tab.
 - ⇒ The table view now contains four entries.
46. Select the entry of type **KEY**.
47. Click **[Export]**.
48. Repeat both steps for the entries of type **CRT** and **CA**.
 - ⇒ The generic security certificate is exported and is now ready to be uploaded to WAGO BACnet-Konfigurator (see Configuration in WAGO BACnet Konfigurator).
49. Click "Network" in the "Solutions" menu.
50. Click **[Merge Detailed]**.
 - ⇒ The "Synchronize Differences" dialog opens.
51. Check whether the "Certificates (BACnet)" entry can be found in the table view and can be synchronized.
52. Click **[Synchronize]**.
 - ⇒ WAGO Solution Builder starts the process of synchronization with the Web-Based Management.

9.6.2 Generating Server Certificates and Synchronizing with Connected Controllers

In applications, existing networks can be protected by server certificates. The following steps provide an example of creating an MQTT network that incorporates this security aspect. For this purpose, protected communication between a server and an external communication partner ("node") is created and put into operation.

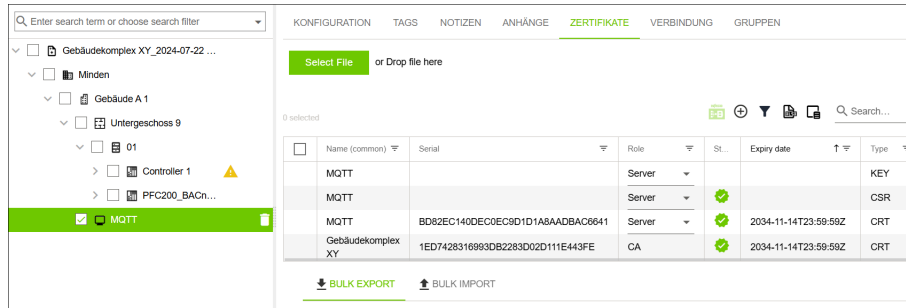
✓ You need to have already created a solution that contains at least two entities of type "Controller."

1. Open your existing solution.
2. In the "Solutions" menu, click the "Configuration" menu item.
3. Select the root element in the tree structure.
4. Click the "CERTIFICATES" tab.
5. Click **[+]** to create a new certificate.
 - ⇒ The "Generate New Certificate" dialog opens.
6. Select **Certificate Authority** from the "Role" drop-down menu.
7. Click **[Generate]**.

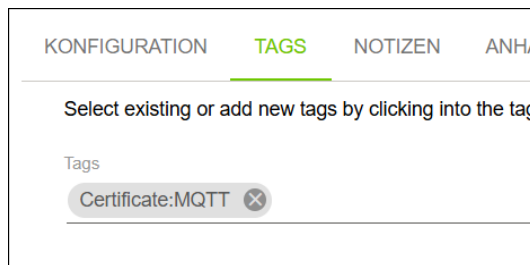


8. Create a "Node" entity in the tree structure to form a higher-level communication group.
9. Name this communication group "MQTT."
10. Click the "CERTIFICATES" tab.

11. Click **[+]** to create a new certificate.
 - ⇒ The "Generate New Certificate" dialog opens.
12. From the "Role" drop-down menu, select the **Server Certificate**.
13. Click **[Generate]**.



14. Click the "Tag" tab.
15. Define a new **Certificate:MQTT** tag.




⇒ The **Certificate:MQTT** tag is defined in WAGO Solution Builder and assigned to the "MQTT" communication group.

16. Assign this tag to all "Controller" entities that should be included in the "MQTT" communication group.

Note **Newly formed group structure is not visible!**

To keep the display manageable, the newly formed group structure is not visible. Nested structures can grow without limit, overloading a central tree structure.

- Use the search if you want to see all elements!
For more information, see ["Filter" Menu Item \[p. 112\]](#).

17. Select the "MQTT" communication group in the tree structure.
18. Click the "CERTIFICATES" tab.
19. Select the server certificate (entry of type "CRT") in the table.
20. Click .

KONFIGURATION TAGS NOTIZEN ANHÄNGE **ZERTIFIKATE** VERBINDUNG GRUPPEN

Select File or Drop file here

1 selected

Name (common)	Serial	Role	State	Expiry date	Type	Action
MQTT		Server	✔		CSR	
MQTT		Server	✔		KEY	
MQTT	7EDFA789CFF8DE320C98AE1136A7FDB1	Server	✔	2034-11-14T23:59:59Z	CRT	
Gebäudekomplex XY	1ED7428316993DB2283D02D111E443FE	CA	✔	2034-11-14T23:59:59Z	CRT	

BULK EXPORT BULK IMPORT

Export all CSR files of all controllers below the selected entity for signing by your certificate provider or export all CRT files by the WSB to secure third party controllers.

Role *

Select...

Type *

Select...

Export

⇒ The server certificate is distributed to all entities of type "Controller" that are included in the "MQTT" communication group.

9.7 Modbus Cross-Communication: Activating Different Port Numbers in the Controller Firewall

- ✓ An Application template needs to have been created in the WAGO Solution Builder Plug-in software to allow Modbus cross-communication.
 - ✓ The Application template must be available as an .atpkg file.
1. Select the "Applications" menu item.
 2. Click **[Select File]**.
 3. Upload the Application template as an .atpkg file.

4. Drag and drop the Application template to assign it to a higher-level entity of type "Controller" (for example, "Floor distributor").

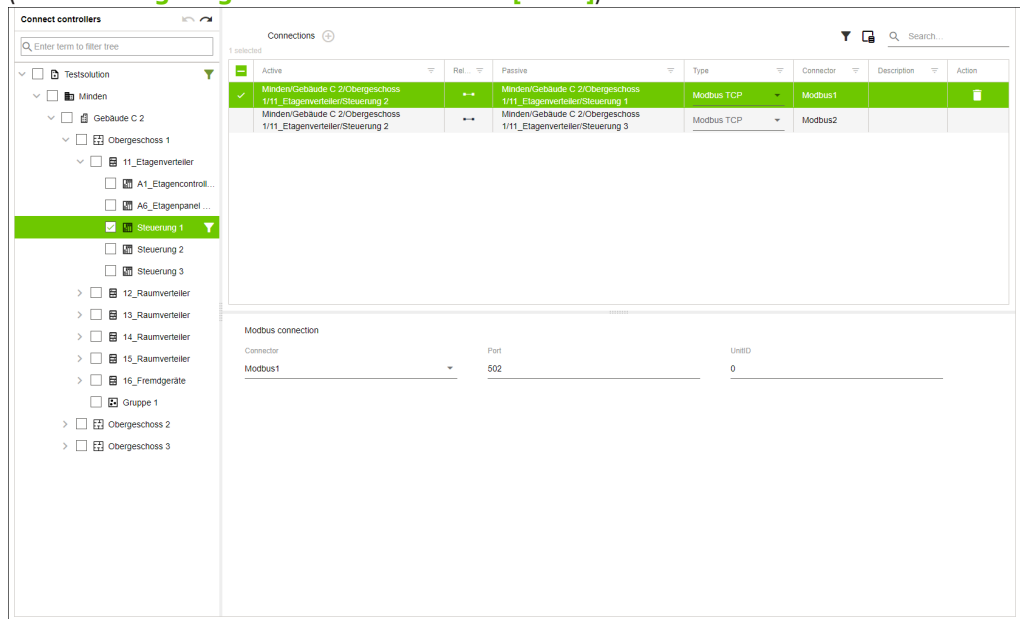
Name	Controller type	Number of instances	Id	Version	Action
Etagenkonfiguration	PFC200 G2 2ETH RS	2	3416cb5f-1b99-4fc6-86c1-853ed2309e75	2021-09-03 13:34:34	
NanoApp 8217	PFC200 G2 2ETH RS 4G	0	3ec76396-72a3-4495-8469-d745966655f0	2021-10-12 10:27:47	
NanoAppBACnetDaisSwitch_8212 FW22	PFC200 G2 2ETH RS BACnetIP	1	56504e0e-4504-4970-9711-7220e9eb262	2022-09-20 15:33:50	
Application Panel	TP600 10.1 1280x800 PIO3 CP	3	584a0057-eab8-4400-a3ef-87ca07896426	2021-09-07 11:08:28	
2 room controller normal	PFC200 G2 4ETH	0	5a8036f8-3a6a-4b15-becf-e49669146545	2022-08-26 15:20:11	
Modbus example 8212 FW22	PFC200 G2 2ETH RS BACnetIP	3	6249c08f-ffe-402d-8378-d36e090bb2ec	2022-10-10 10:41:49	
Modbus example IPK FW22	PFC200 G2 2ETH RS BACnetIP	0	6249c08f-ffe-402d-8378-d36e090bb2ec	2022-09-20 15:37:12	
Modbusbeispiel CC100	0751-9501 WIAGO Compact Controller 100	0	760445a5-3fc8-486e-8229-e94feb39d37a	2022-08-09 14:15:24	
Zweiraumsteuerung	PFC200 G2 2ETH RS BACnetIP	8	99836d6b-004d-4fc9-a18b-5776209c0bd	2021-09-03 11:20:13	
2 room controller with FM edit 8210 FW20	PFC200 G2 4ETH	0	c94f5216-d4af-40b9-a2bd-3a88025ae32	2022-10-10 14:56:41	

⇒ An additional entity of type "Controller" is created each time a new assignment is made by dragging and dropping.

5. Repeat step 4 two times in a row to create a total of three entities of type "Controller."

6. Select the "Cross-communication" menu item.

- Configure two cross-communication links for the three new entities of type "Controller" (see [Configuring Cross-Communication](#) [> 176]).



- For each cross-communication link, select **Modbus TCP** from the "Type" drop-down menu.
- From the "Connector" drop-down menu, select a connector for each cross-communication link you defined in the WAGO Solution Builder Plug-in software.
- Assign a unique port number for each cross-communication link. These port numbers must be different.

Port

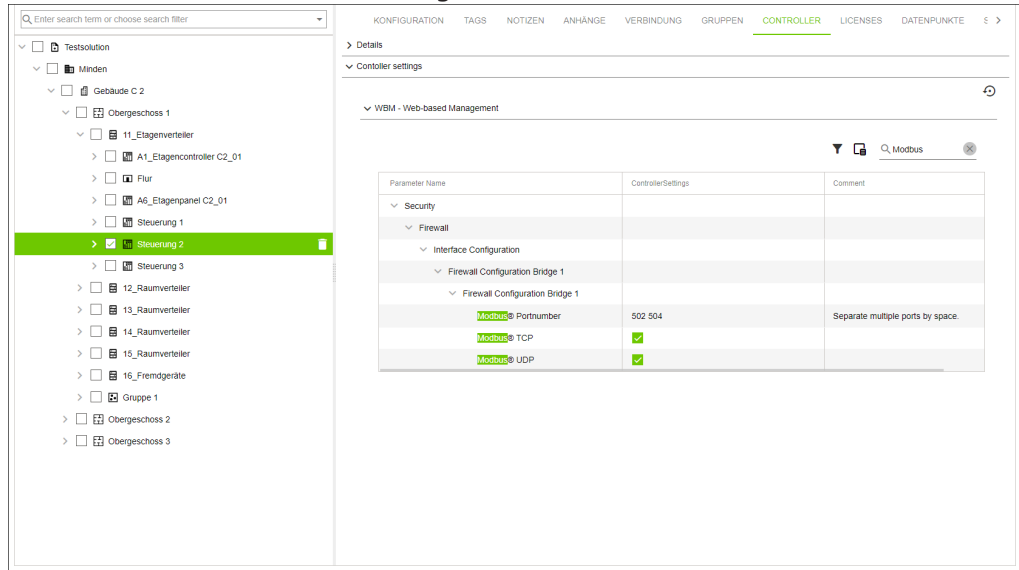
502

Port

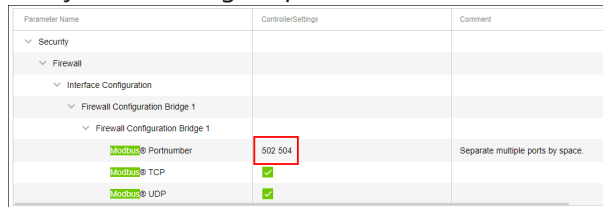
504

- Select the "Configuration" menu item.
- In the tree structure, select one of the newly created entities of type "Controller."
- Select the "CONTROLLER" tab.

14. Select the “WBM – Web-Based-Management” item.



15. Verify that the assigned port numbers are listed under “Controller Settings.”



➔ The assigned port numbers will be activated the next time the controller firewall is synchronized.

9.8 Activating Connection Filters

1. Select menu item “Cross-communication”.
2. Select any entity that contains subordinate child elements.
 - ⇒ The filter icon is displayed at the right in the selected entity.
3. Click on the filter icon.
 - ⇒ In the “Properties” area all configured cross-communication is displayed that is located with a subordinate role in the entity tree. The “active controllers” and “passive controllers” are mapped here for each cross-communication (see [Configuring Cross-Communication \[p. 176\]](#)). The paths that are displayed are composed directionally of all subordinate child elements here.

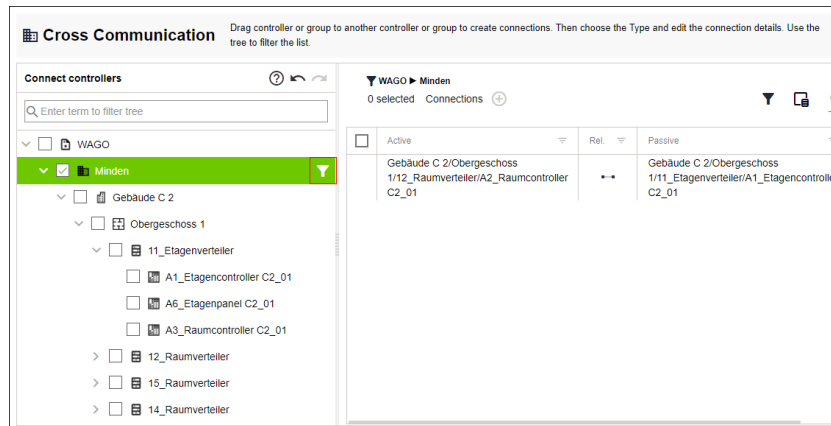
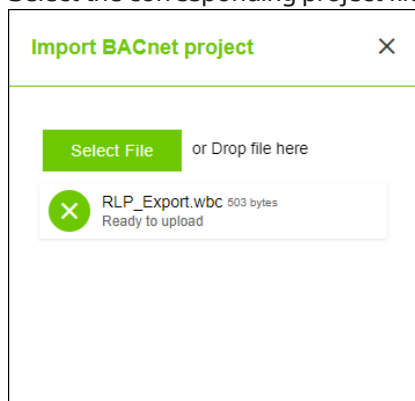


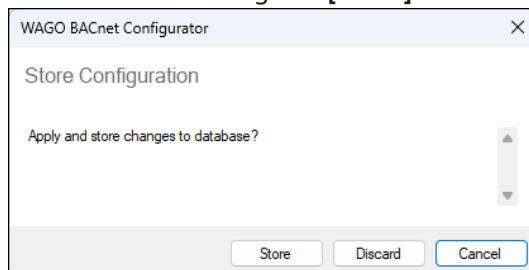
Figure 170: Activate connection filter

9.9 Importing a Project File from WAGO BACnet Configurator

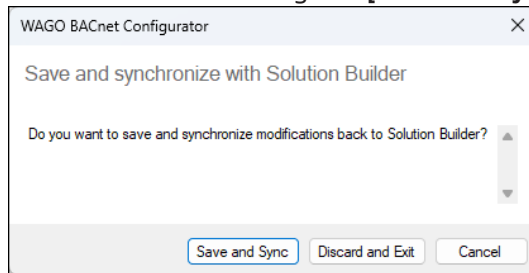
- ✓ You must have an exported project file from the WAGO BACnet-Konfigurator software. The project file itself must contain at least one controller that has been created.
1. Click the "SCAN / IMPORT" tab in the "Network" menu.
 2. Click **[Import BACnet ...]**.
 3. Select the corresponding project file.



4. Click **[Import]**.
 - ⇒ The WAGO BACnet-Konfigurator software opens in the background.
5. In the WAGO BACnet-Konfigurator software, press **CTRL + S**.
 - ⇒ Two final dialogs appear.
6. Confirm the first dialog with **[Store]**.

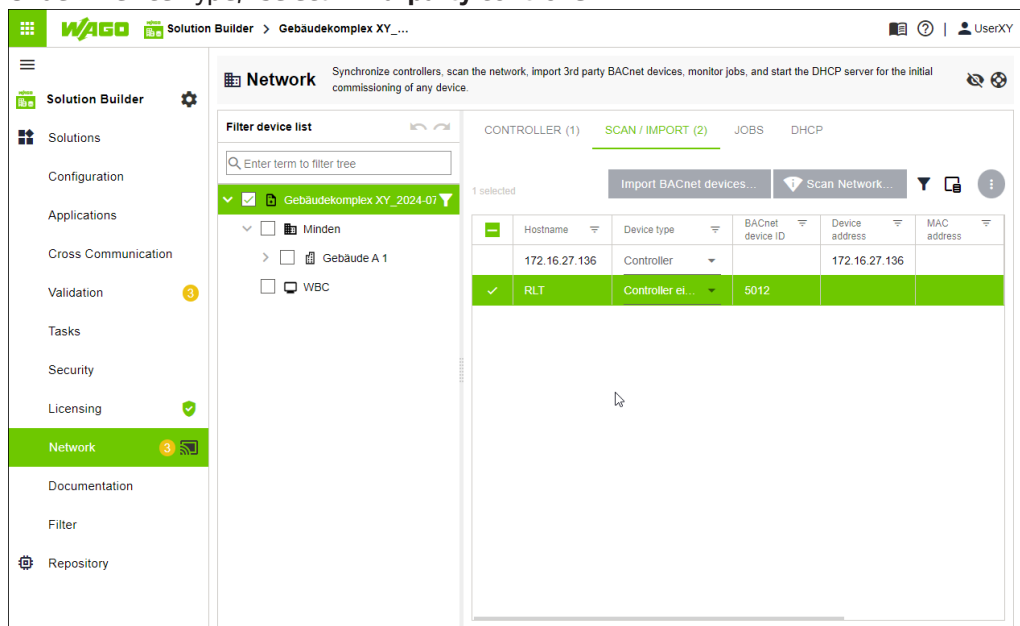


7. Confirm the second dialog with **[Save and Sync]**.



- ⇒ The WAGO BACnet-Konfigurator software closes.
- ⇒ The project file is synchronized with the WAGO Solution Builder software and then imported.

8. Select the imported controller.
9. Under "Device Type," select **Third-party controller**.



10. Drag and drop the imported controller onto the "Solution" entity.
 - ⇒ The controller is created in the tree structure as a "Third party controller" entity.
 - ⇒ The controller is created on the "CONTROLLER" tab and can be synchronized there and further configured.

9.10 Creating Entity Types in the Structure Editor

1. Open the structure editor by selecting an addressing system (see **"ADDRESSING SYSTEMS" Tab [▶ 115]**).
2. In the tree structure, select the entity type to which you want to add a lower-level entity type.
3. Click **[+]**.

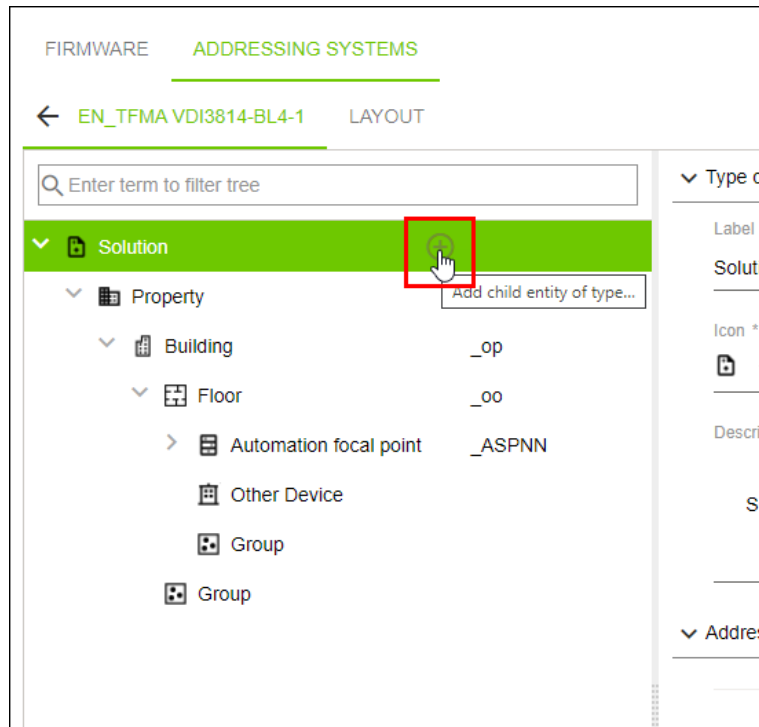


Figure 171: Button: Add Lower-Level Entity Type

- ⇒ A selection list with entity types appears.

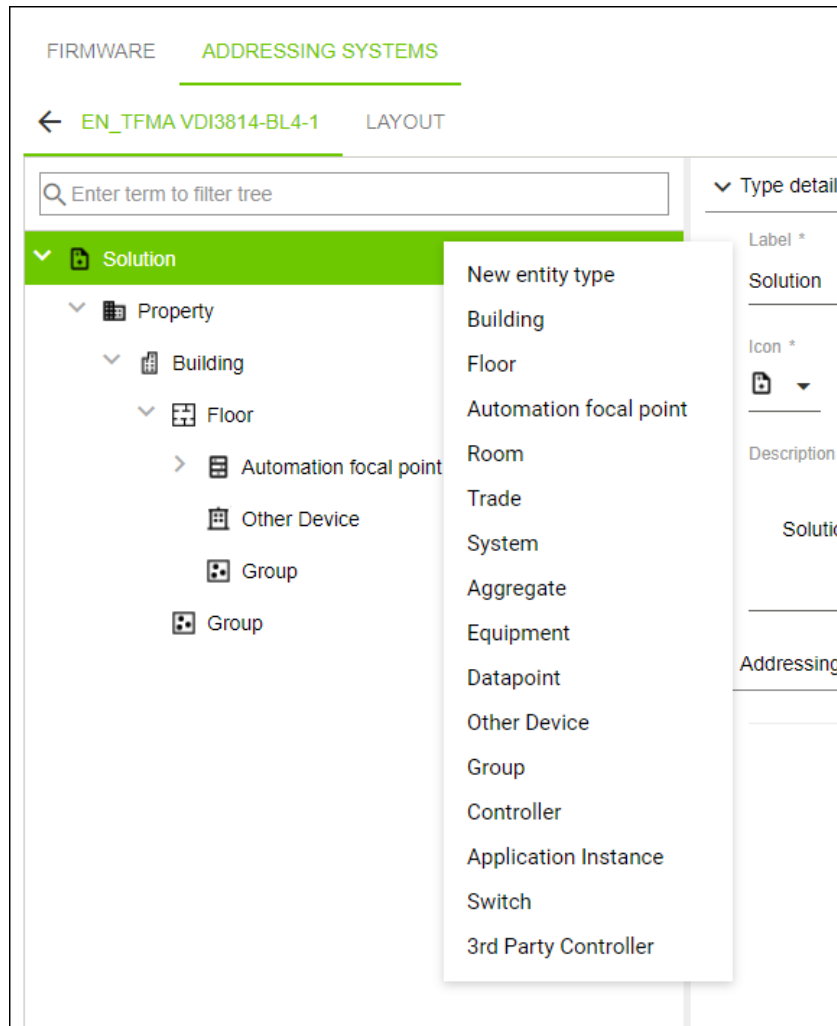


Figure 172: Selecting a Lower-Level Entity Type

4. Select the entity type you want to add to the tree structure. You have the option of creating a new entity type or reusing an existing entity type.

Creating New Entity Type

- To create a new entity type, select “New Entity Type.”
You can find more information in section [Properties When Creating an Entity Type \[p. 124\]](#).

Reusing an Existing Entity Type

- To reuse an existing entity type, select one of the listed entity types.
Note however that an existing entity type is only referenced, not copied. You can find more information in section [Properties When Creating an Entity Type \[p. 125\]](#).



Note

Referenced entity types are always displayed without child elements!

If an existing entity type with lower-level child elements is used multiple times in the tree structure, the referenced entity type is shown without child elements. The child elements are still present, but are hidden for clarity!

9.11 Editing Options Tables or Tags Externally

- ✓ You want to edit an options table as described in [Options Table \[p. 123\]](#) externally.
- ✓ You want to edit tags as described in section ["TAGS" Sub-Tab \[p. 125\]](#) externally.

1. Click  .
 - ⇒ The corresponding options table or tags are then copied to the clipboard.
2. Open the program in which you wish to make changes.
 - ⇒ You are then offered a spreadsheet program, such as Microsoft Excel. Here you can also display individual entries in a clearly organized representation and sort them however you need.
3. Press **[CTRL]+[V]**.
 - ⇒ The corresponding options table or tags are then added to the program.
4. Make your changes.
5. Press **[CTRL]+[A]**, followed by **[CTRL]+[C]**.
 - ⇒ The corresponding options table or tags are marked and copied.
6. Go back to the WAGO Solution Builder software.
7. Click  .
 - ⇒ The corresponding options table or tags are copied back to the WAGO Solution Builder software table.

9.12 Assigning Access Control to Entities

Specific access rights can be assigned for individual entities. They allow you to deliberately restrict the permissions of users that have been created and totally block specific actions in the software. In the tree structure, these access rights can be assigned below the root element.

Example: If a "User A" is granted access rights to an entity of type "Building" that has been created, this entity is locked for "User B" and "User C" and not visible to these users in the tree structure. Thus "User B" and "User C" are totally prevented from making edits, and only "User A" as access rights.

Access rights that are granted are further inherited in the tree structure below the root element if no other user is granted corresponding access rights for lower-level entities. The access rights also affect the other menu items, meaning that, as a general rule, they only show what can actually be edited.

Note

Access control also affects global activities in the software!

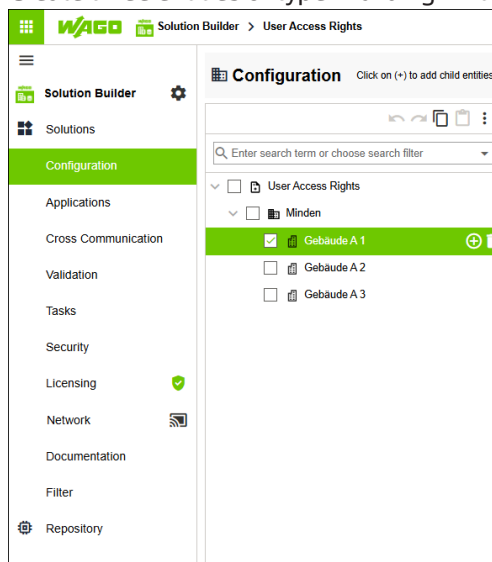
As a user with restricted access rights, you cannot perform the following actions:

1. Reloading device settings
 2. Updating application templates
 3. Editing addressing systems
- ➔ Log in with the "Owner" role to perform these actions!

The following sections explain how to create individual users and assign access rights.

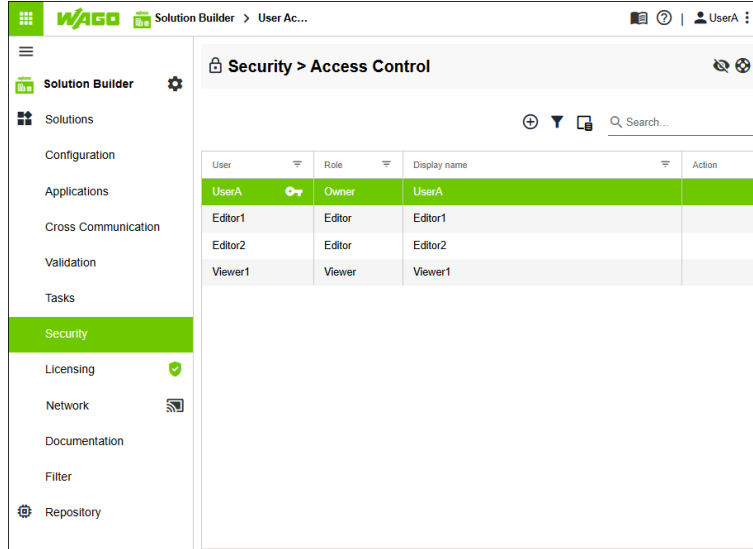
9.12.1 Defining Entities and Creating Users

1. Create a new **solution** (see [Create New Solution \[p. 173\]](#)).
2. Under "Solution Name," enter the name **User Access Rights**.
3. Under "Addressing System," select **AMEV BAM 2021 E1**.
4. Under "User," assign a new **solution user**.
5. Under "Password," assign a new password.
6. Click **[Create]**.
 - ⇒ The user is created as an "owner" in the solution and can then set and assign all access parameters. This user is not subject to any access restrictions itself!
7. In the "Solutions" menu, click the "Configuration" menu item.
8. Create three entities of type "Building" in the tree structure.



9. Click "Security" in the "Solutions" menu.
10. Click **[Access Control]**.
11. Create three additional users in a row for the existing owner. Use descriptive names to make it easier to identify them later.

12. Assign different roles to the users you create.

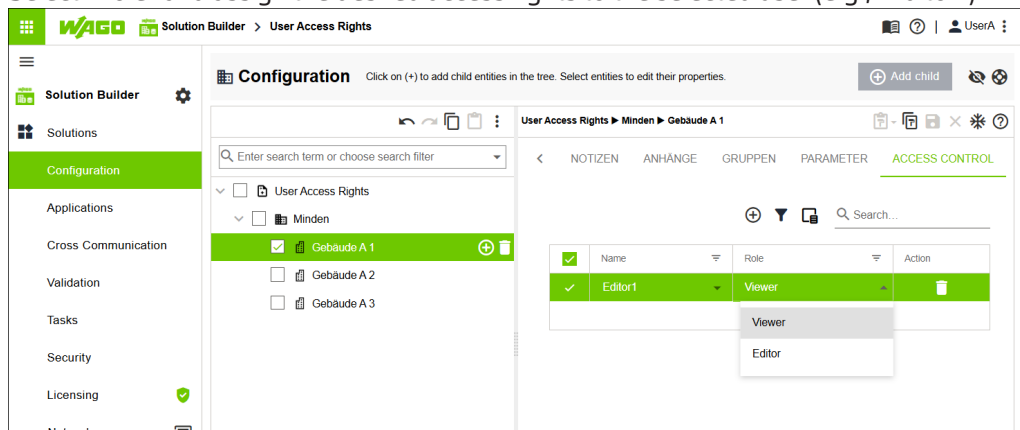


⇒ The users are now created in the solution. Users can now be assigned access rights (see [Assigning Users and Granting Access Rights](#) [▶ 194]).

9.12.2 Assigning Users and Granting Access Rights

✓ You need to have performed all the steps from section [Defining Entities and Creating Users](#) [▶ 193].

1. In the "Solutions" menu, click the "Configuration" menu item.
 2. In the tree structure, select the first entity of type "Building" you created.
 3. Select the "ACCESS CONTROL" tab.
 4. Click .
- ⇒ A new line is added.
5. Under "Name," select one of the users you created (e.g., "Editor 1").
 6. Select "Role" and assign the desired access rights to the selected user (e.g., "Editor").



7. Repeat the steps for all other entities of type "Building" and assign individual access rights for all other users.

8. Click **[Save]**.

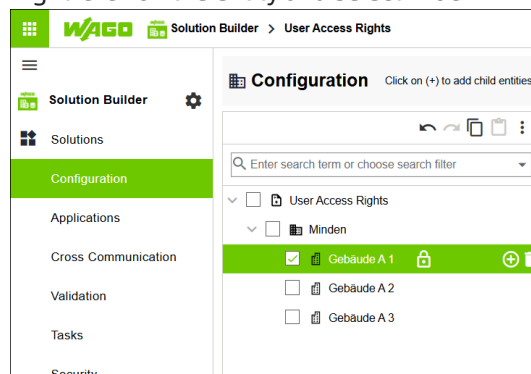
⇒ All "Building" entities are assigned individual access rights.


9.13 Giving Entities Temporary Write Protection

Write protection can be assigned to individual entities temporarily. This write protection can be seen as an extended security instance for when two or more users have access rights to a specific entity. For example, if "User A" and "User B" are working together simultaneously on one solution, one of the two users can temporarily lock the "Building A1" entity. All lower-level child entities of this "Building A1" subtree are then also write-protected. When the work is done, the write protection can be lifted.

✓ You need to have set up corresponding users and assigned access rights in the solution (see [🔗 "Access Control" Dialog \[▶ 87\]](#)).

1. In the "Solutions" menu, click the "Configuration" menu item.
2. In the tree structure, select the entity of type "Building" that you want to lock.
3. Right-click on the entity and select "Lock."



⇒ The entity is marked with the  symbol and can no longer be edited by other users.

4. Carry out your work steps.
5. Right-click on the entity and select "Unlock."
 - ⇒ All authorized users are again able to edit the entity.

10 Appendix

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Glossary

Access Control

Specific access rights can be assigned for individual entities. They allow you to deliberately restrict the permissions of users that have been created and totally block specific actions in the software. In the tree structure, these access rights can be assigned below the root element. For example, if a "User A" is granted access rights to an entity of type "Building" that has been created, this entity is locked for "User B" and "User C" and not visible to these users in the tree structure. Thus "User B" and "User C" are totally prevented from making edits, and only "User A" as access rights. The access rights that are granted are further inherited in the tree structure below the root element if no other user is granted corresponding access rights for lower-level entities.

Addressing system code

Individual instance for a complete code, based on the selected addressing system.

Addressing System

General Identification System in Building Automation. Addressing systems are saved as .xml files and can be used in the WAGO Solution Builder and WAGO Solution Builder plug-in. The addressing system is also known as the plant identification system/plant identification code (AKS) or user addressing system/user addressing code (BAS) in some industries and countries. See also "Structure Definition".

Application Instance

Individual instance of an application template. The instance parameters are populated with values are executable on a connected controller.

Application Template

Exported data packet from an IEC development environment (CODESYS or *e!COCKPIT*). The IEC development environment must be expanded with the WAGO Solution Builder Plug-in. The data packet contains a boot application, a fieldbus configuration, a description and, optionally, a functional data model. The packet can be imported to the WAGO Solution Builder.

Aspect

Visualization element with combined functionality. This element is used in the WAGO Solution Builder. The arrangement and grouping of aspects can be configured in the graphical user interface.

Audit Trail

Change record: Enables or disables recording of activities in the solution.

BACnet/IP Broadcast Management Device

In BACnet, a BACnet/IP broadcast management device (BBMD) assumes the role of distributor of broadcast messages and is required when IP routers must be negotiated during communication.

BACnet/SC Hub

Central communication node used to manage communication

BACnet/SC Nodes

Individual participants in the communication

BBMD

See "BACnet/IP Broadcast Management Device"

DCS

See "WAGO Device Communication Service"

Entity

Single, uniquely defined element used in data modeling.

GVL

Global Variables List

IEC Development Environment

Development environment in which application templates for WAGO Solution Builder can be created. To create application templates in a development environment, the corresponding WAGO Solution Builder plug-in must be installed. The WAGO Solution Builder Plug-in is available for the CODESYS and **e!COCKPIT** IEC development environments.

IPK Package

An IPK package is a compilation of individual IPK files. IPK files ("Itsy Package File") are small installation files. They are designed for distributing software and other utility programs over low-resource computers such as routers, multimedia receivers, set-top boxes, etc.

Job

All actions to be performed by the WAGO Solution Builder with the interconnected devices are placed in one or multiple jobs. The jobs can be located in a queue and processed either in parallel or one after the other by the WAGO Device Communication Service, depending on their type and the application case. For example, a job can be a firmware update that is executed simultaneously on 100 controllers.

Parameter Set Object

As an extension of a formula definition, a "Parameter Set Object" describes the parameters of an application template that the user can configure individually for each application instance in WAGO Solution Builder.

Private Key

Personalized key

PSO

See Parameter Set Object

sbicons file

Structured Solution Builder Icons file. The sbicons file is a container file. It contains a complete collection of all available icons, including the underlying structure.

sbsd file

Structured Solution Builder Structure Definition file. The sbsd file is a container file. In addition to the corresponding xml file the sbsd file also contains all the icons that are used. These types of files therefore map the complete structure of an existing addressing system. As a result, the addressing system can be imported in its full scope to a further WAGO Solution Builder.

sbxpart File

Structured "Solution Builder Part Export" file. The sbxpart file is a container file. In addition to a package info file, it contains all files necessary for importing a subtree. Only the selected elements and their child elements are viewed and exported.

Solution

Customer project for WAGO building automation. A solution can comprise technical equipment of a large customer, including all its buildings, or just one single building project.

Structure Definition

The functionality of the addressing system in the WAGO Solution Builder far exceeds a pure addressing key; it also allows standard tags to be defined and the setup of the parameter editor. That is why this is also referred to as the "structure definition" for a solution. See also Addressing System.

TAG

A tag is an identification of a database with stored information and meta-data.

URI

Uniform Resource Identifier

WAGO BACnet Configurator

WAGO software for configuring the fieldbus on WAGO BACnet controllers.

WAGO DALI Configurator

WAGO software for configuring the fieldbus when using the WAGO DALI Multi-Master.

WAGO Device Communication Service

The WAGO Device Communication Service is an external interface for interconnected fieldbus controllers. The WAGO Device Communication Service is launched as a Windows service and executes individual job-based actions on the fieldbus controllers.

WAGO SMI Configurator

WAGO software for configuring the fieldbus when using the WAGO SMI Master.

WAGO Solution Builder User

User with a defined role and the associated rights. This user can work in WAGO Solution Builder outside of a special solution. The user is stored in WAGO Solution Builder's global database.

WAGO Solution User

User with a defined role and the associated rights. This user can work in WAGO Solution Builder within a special solution. The user is stored in WAGO Solution Builder's global database.

WBC

See "WAGO BACnet Configurator"

WDC

See "WAGO DALI Configurator"

WSC

See "WAGO SMI Configurator"

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