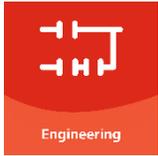




CODESYS® V3.5 SP20

Features and Improvements

Including presentation of component updates since the release of the last Service Pack.



ENGINEERING



RUNTIME / SAFETY



AUTOMATION SERVER



VISUALIZATION



MOTION CNC ROBOTICS



FIELDBUS



COMMUNICATION



CODESYS ENGINEERING



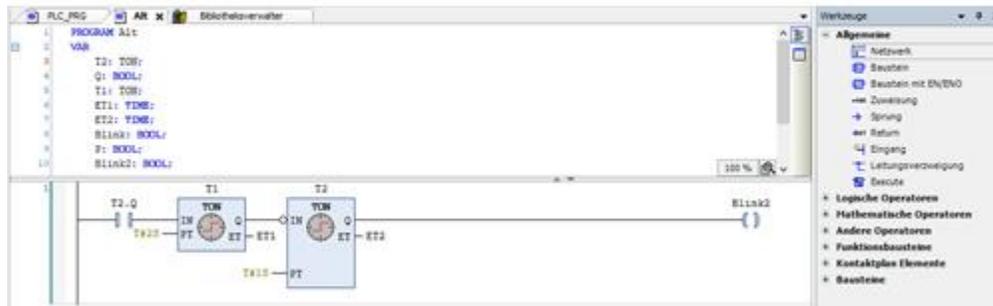
Overview

- **New Ladder Diagram editor**
- **Project Compare for object properties**
- **Improved License Manager**
- **New License Provider**
- **Scripting feature for CODESYS Git**
- **Improved CODESYS Installer**
- **Setup support for device manufacturers via Deployment Server**
- **New CODESYS String Library package**
- **New Offline Help**
- **Further improvements**

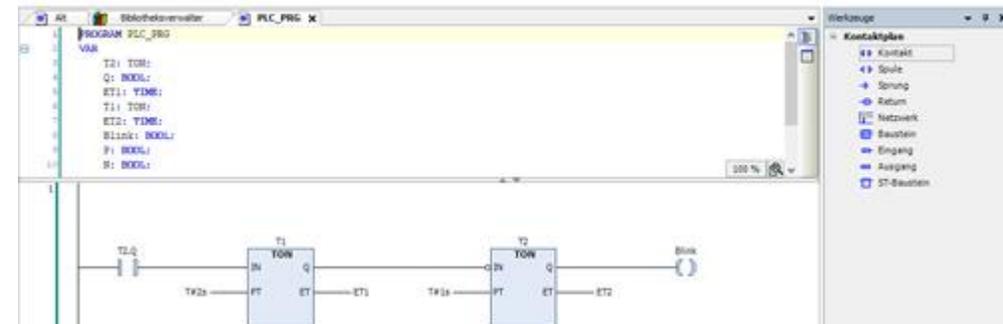
New Ladder Diagram editor

- Most important new features:
 - Modern, streamlined editor with a simplified toolbox
 - Own database (no longer combined with the FBD editor)
 - Easy workflow for creating open and closed branches
 - Storage format prepared for storage in git

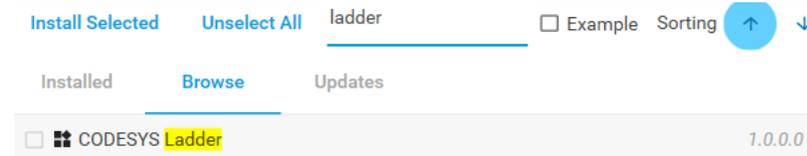
Ladder Diagram editor (previous editor):



Ladder Diagram editor (new editor):

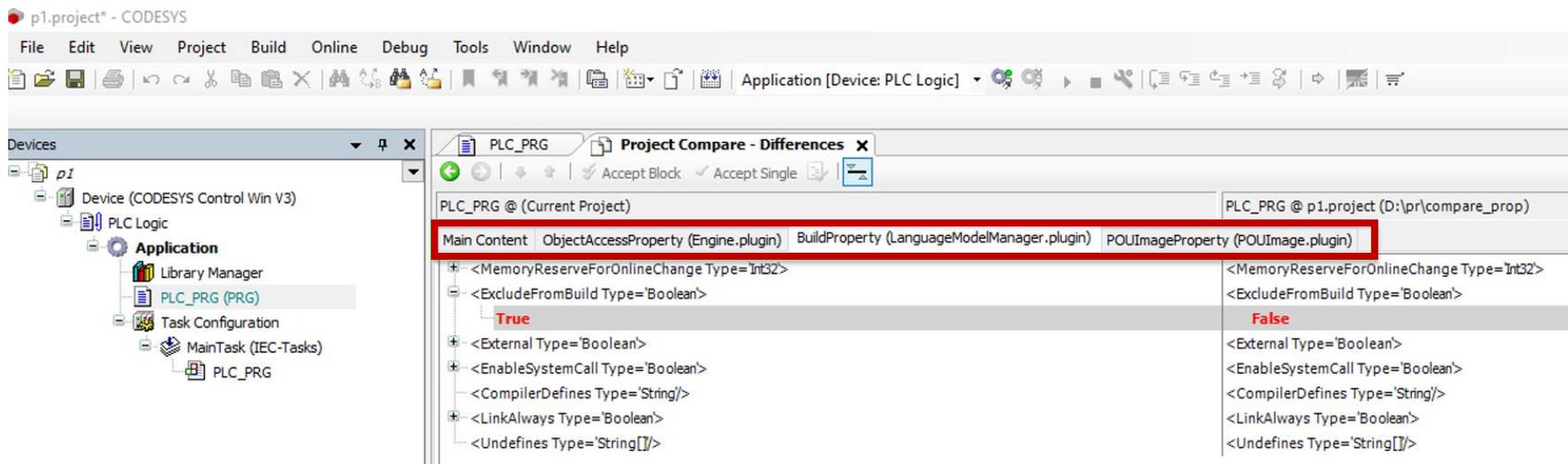


- Available in the CODESYS Installer



Project Compare for object properties

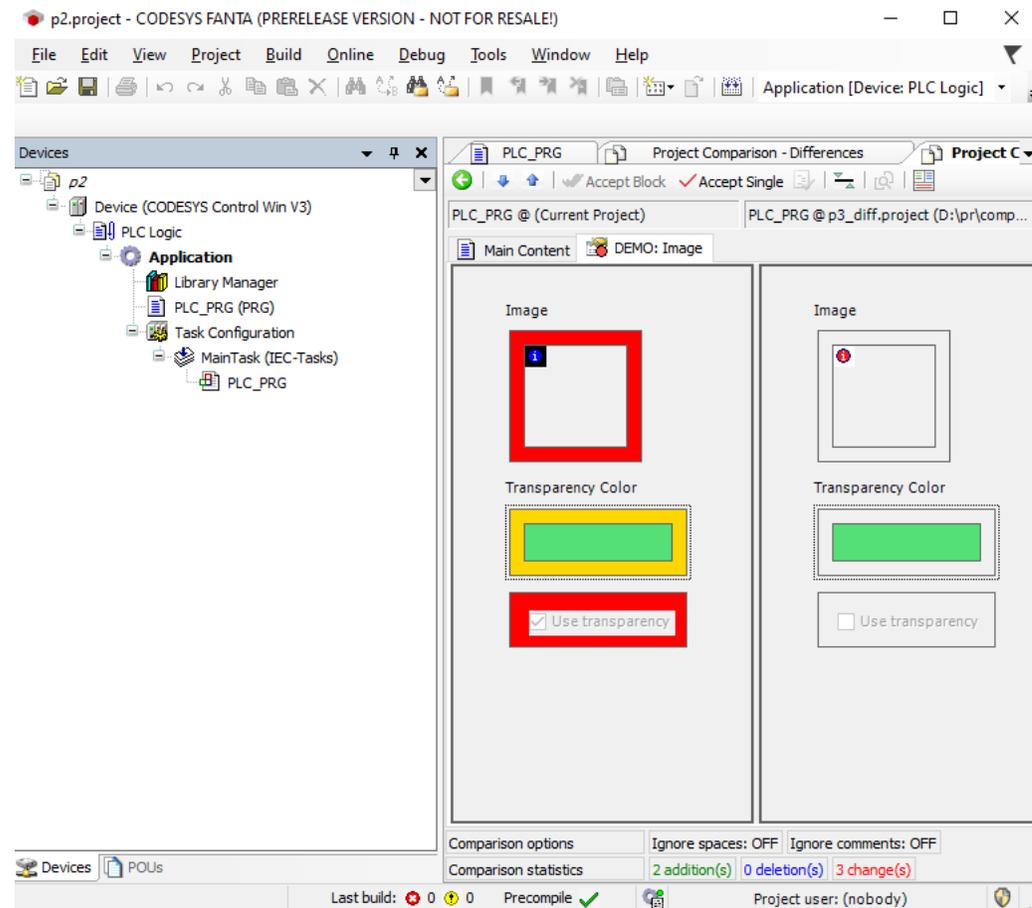
- Additional comparison of object properties in *Project Compare*
- Differences displayed in additional tabs in text form



- Changes can be compared but not accepted in the generic editor.

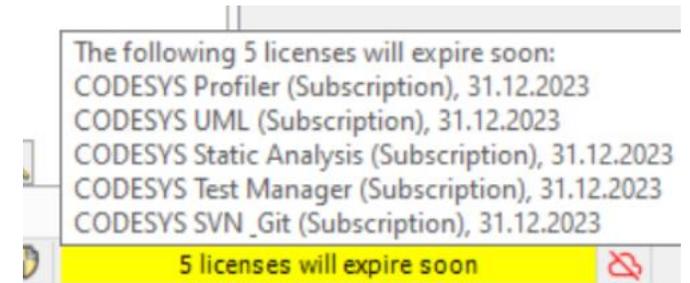
Project Compare for object properties

- Users of the Automation Platform:
Customizable editor to display and accept changes



Improved License Manager

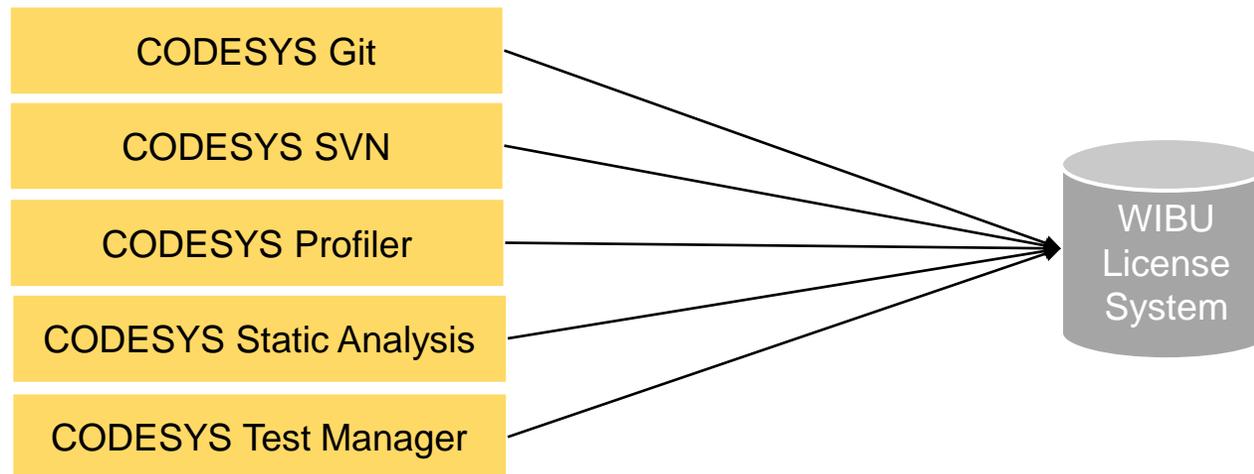
- **Status bar indicating expiring subscription licenses**
 - Color scheme to indicate when licenses expire
 - ≤ 0 : red
 - ≤ 7 : yellow
 - ≤ 14 : salmon
 - ≤ 30 : no color
 - Only for workstation licenses
- **Internal update of WIBU APIs to receive more meaningful error messages in the message window**



New License Provider

Recap: Licensing the Professional Developer Edition before 3.5.19.30

- Add-ons of the CODESYS Professional Developer Edition directly linked to WIBU Systems licensing
- Updates of WIBU components might imply updates of the CODESYS Professional Developer Edition add-ons
- Customized licensing for device manufacturers (almost) impossible



New License Provider

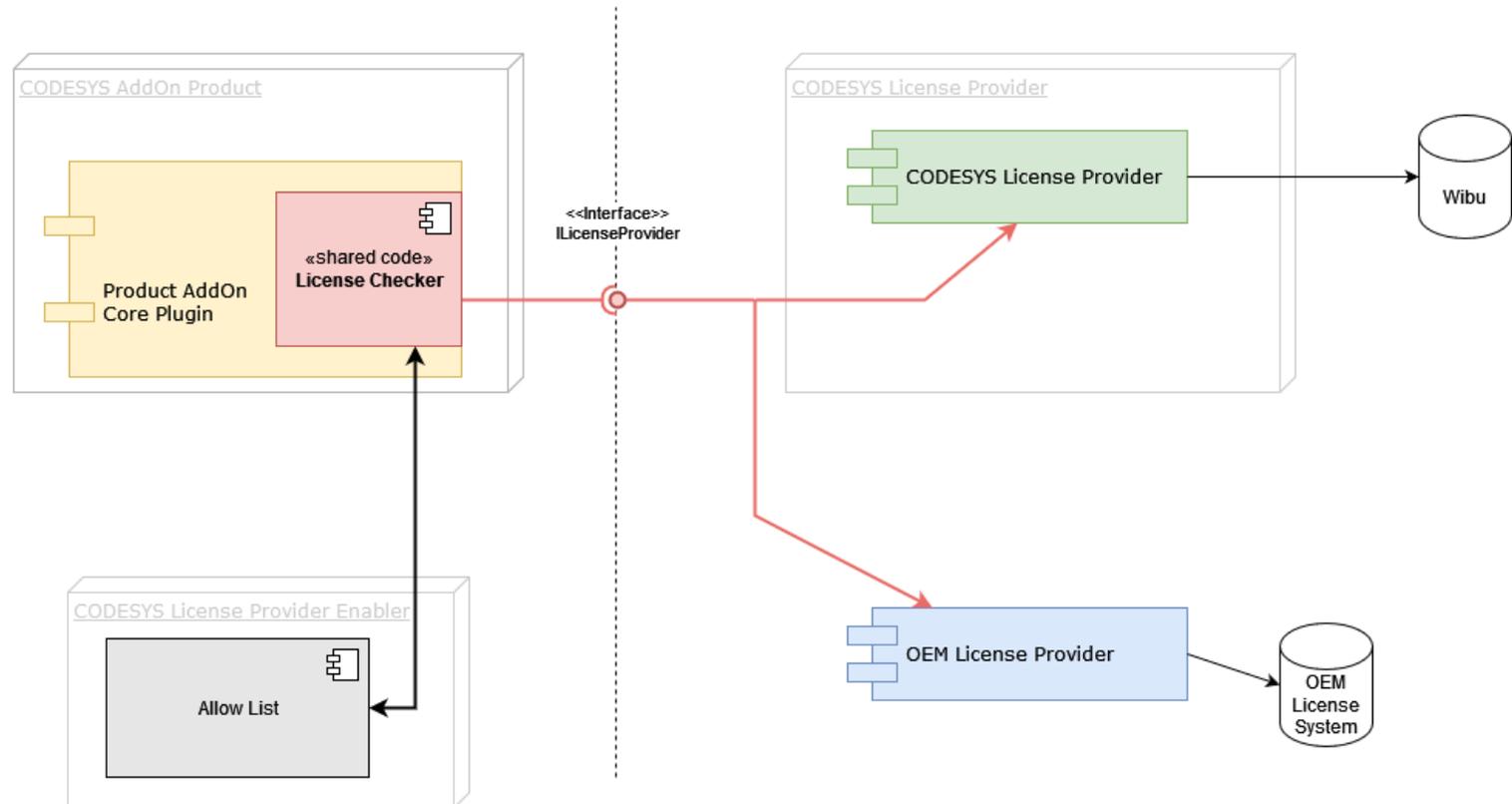
Licensing the Professional Developer Edition as of 3.5.19.30

Pros

- License Provider interface encapsulates licensing system
- Updates of WIBU components
→ New License Provider plug-in
- Device manufacturers: Specific License Provider plug-ins possible
- Sublicensing of the add-ons by device manufacturers “out of the store“
- No change for users (existing licenses remain valid and the same)

Cons

- Device manufacturers: Deployment of additional packages necessary



New License Provider: Implications for device manufacturers

- **New way of deploying add-ons of the CODESYS Professional Developer Edition**
 - Additional add-ons must be deployed in the matching version:
 - CODESYS License Provider
 - and/or –
device-manufacturer-specific „License Provider“, if existing
 - CODESYS License Provider Enabler
 - CODESYS Licensing Support
 - Note: CODESYS Installer takes care of this already.
- **New option: Device-manufacturer-specific „License Provider“**
 - Contact the CODESYS Sales Team at sales@codesys.com
- **All add-ons of the CODESYS Professional Developer Editions newly released for 3.5.19.30**

Scripting feature for CODESYS Git

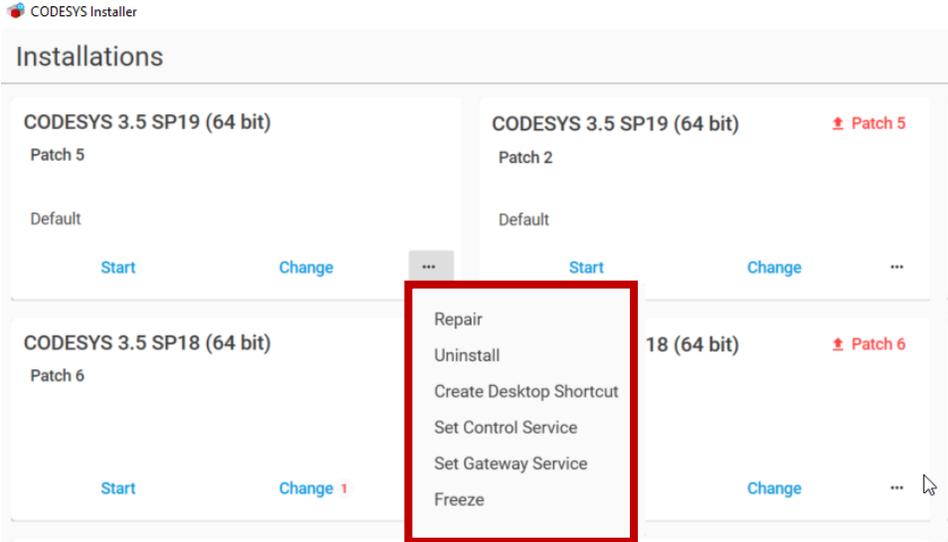
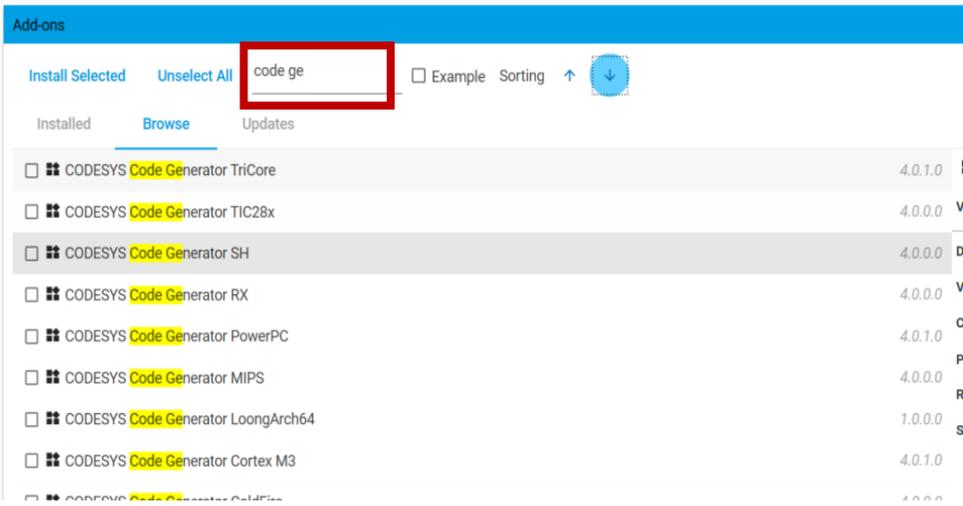
- Automate Git operations via Python scripts edited with external editor, e.g. PyCharm
 - Prepare new project and import CODESYS code completions for CODESYS Git
 - Edit script file and access CODESYS Git commands
 - Execute script file in CODESYS with *Tools* → *Scripting* → *Execute Script File*

```
18 from CODESYS import *
19
20 git.c..
    clone(self, stProjectLocation, stProjectName, sSourceUrl, gitProjectStoragePath, update_flags) ScriptDriverGitImpl
    recover_project(self, stProjectLocation, stPr... ScriptDriverGitImpl
    __class__ object
    __doc__ ScriptDriverGitImpl
    __dict__ object
    __init_subclass__(cls) object
    __reduce__(self) object
    __reduce_ex__(self, __protocol) object
    Press Eingabe to insert, Tabulator to replace Next Tip
```

```
18 from CODESYS import *
19
20 projects.primary.git.
    branch(self) GitScriptProject
    init(self, gitProjectStoragePath) GitScriptProject
    branch_copy(self, oldBranchName, newBranchName, ... GitScriptProject
    synchronize_project(self) GitScriptProject
    project_handle GitScriptProject
    add_all(self) GitScriptProject
    branch_delete(self, branchName, force) GitScriptProject
    branch_set_upstream(self, remoteName, branchName) GitScriptProject
    branch_show_current(self) GitScriptProject
    branch_track(self, trackedBranchName, localBranchName) GitScriptProject
    branch_unset_upstream(self, branchName) GitScriptProject
    checkout(self, branchName, force) GitScriptProject
    Strg+Unten and Strg+Oben will move caret down and up in the editor Next Tip
```

Improved CODESYS Installer: User interface

- Redesigned tiles
- Realtime filtering of add-ons
- Sorting of add-ons
- Detailed information why an add-on cannot be installed



Improved CODESYS Installer: Security and vital add-on updates

- **Update indication**
 - Security
 - Language model changes
- **Update mode for installations**
 - Define update kinds to receive

☰ Test Package Metadata

Version:	1.2.3.7	 	Install
Description	This package contains test metadata.		
Vendor:	CODESYS GmbH		

Update Mode

▼ All

- None
- Code-identical Security-relevant
- Security-relevant
- Code-identical Update
- All

  Install

Update Mode

All

- None = No updates
- Code-identical Security-relevant = Non code-changing security updates
- Security-relevant = Code-changing security updates
- Code-identical Update = Non code-changing updates
- All = All updates

Improved CODESYS Installer: Further issues

- **Proxy support**
 - Store proxy credentials for network communication
- **New Icon** 
- **Open HTML file after add-on installation**
 - Only if defined in an add-on
- **Setup support for device manufacturers via Deployment Server**

Proxy ^

Proxy Address
http://test.proxy

Proxy User

Proxy Password

Use System Proxy

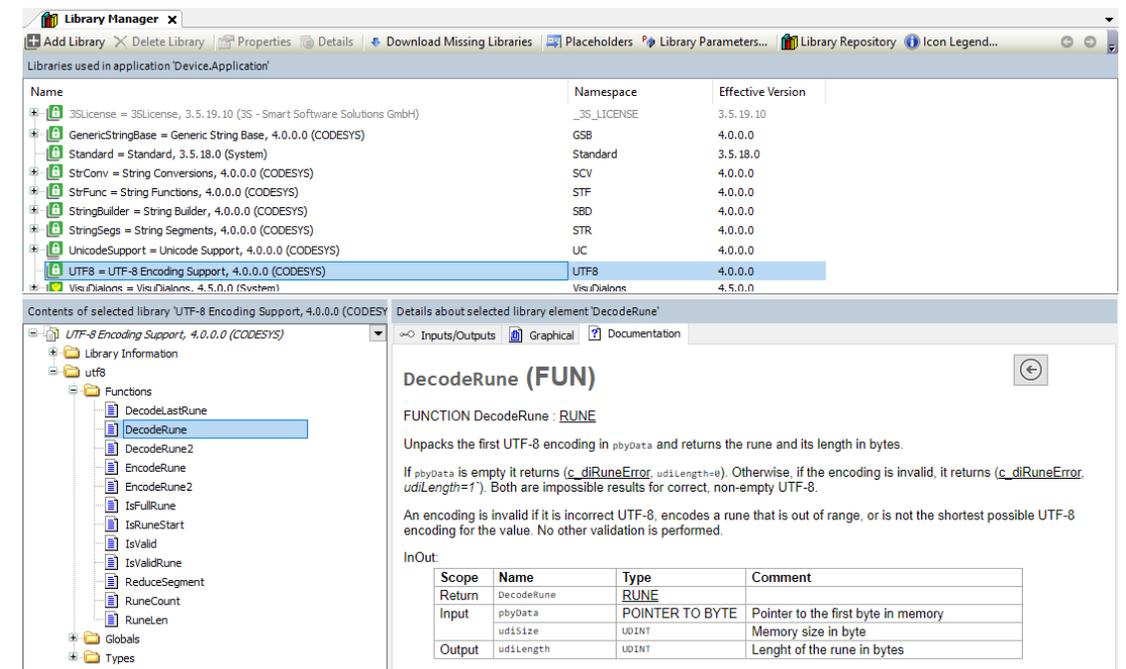
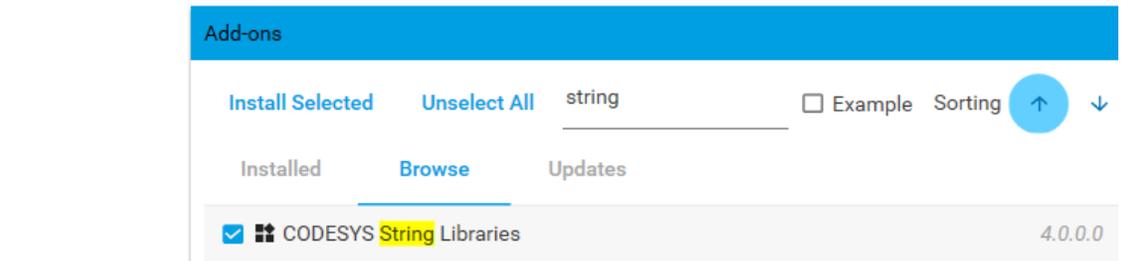
[Test Proxy](#)

Setup support for device manufacturers

- **Source code of the Deployment Server available for customers of the CODESYS Automation Platform**
- **Support of**
 - Single executables
 - Archives (for setups containing multiple files)

New CODESYS String Library package

- CODESYS String Libraries package: libraries for processing UTF-8 encoded strings
- Advantages
 - Efficient handling of small and large strings
 - Suitable for editing large text files and web contents
 - Processing Unicode strings (UTF-8 encoding)
 - Unlimited length (up to $\sim 4 \times 10^9$ characters)
 - Efficient operations with minimized copying
 - Incremental reading of UTF-8/16 encoded text as simple as pure ASCII



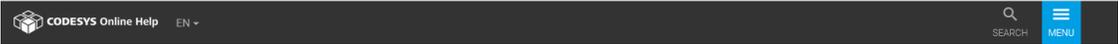
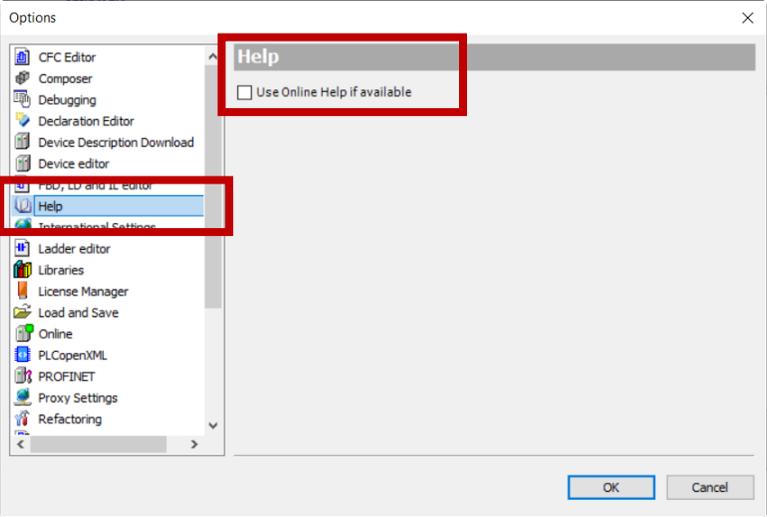
New CODESYS String Library package

▪ Content

- UTF-8 Encoding Support: Base function for handling UTF-8 encoded memory areas
- String Builder: Efficient management of UTF-8 encoded string segments
- String Segments: Base functions for IString instances
- String Conversions: Conversion of strings of different encoding to/from UTF-8
- String Functions: Functions for processing UTF-8 encoded strings following the example of the conventional standard library
- Unicode Support: Functions for processing UNICODE character categories
- Generic String Base: Function blocks for processing UTF-8 encoded strings that manage their memory statically via GENERIC CONSTANT

New Offline Help

- Installation
 - From the CODESYS Online Help
 - In the CODESYS Installer
- Further CHM-based offline help possible



CODESYS Online Help

Welcome to the official CODESYS help site. Here, CODESYS Group experts have compiled answers to the most important questions from all CODESYS areas.

You have two options: Click through the topic tiles, or enter your search term directly into the search window.

NEW! CODESYS Offline Help

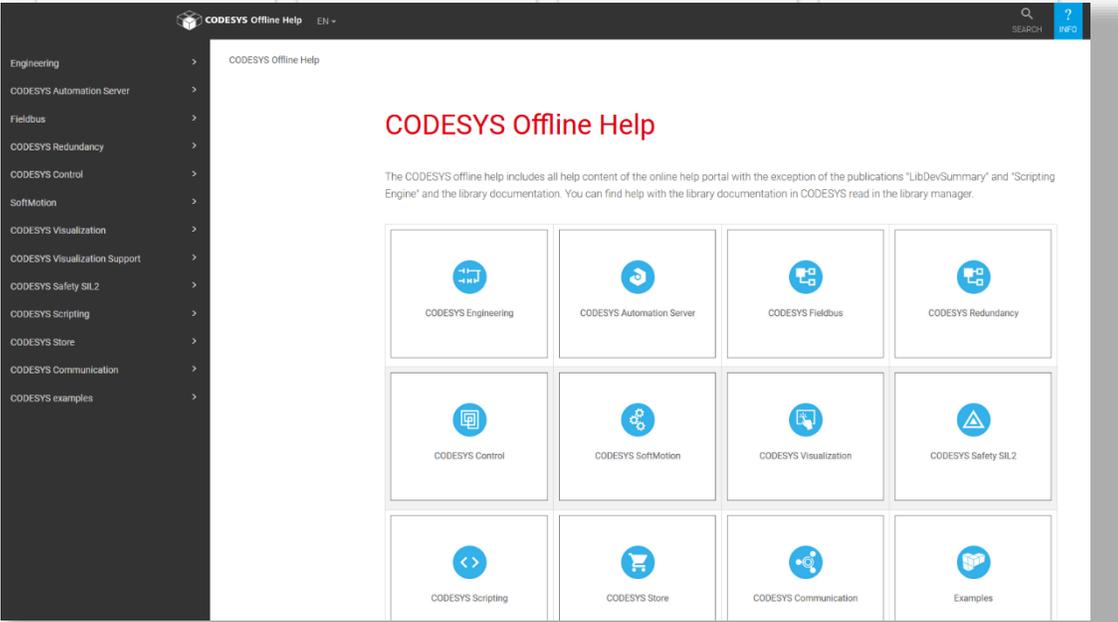
In contrast to the online help, the offline help is available as a local installation. As a result, it can be used without Internet access.

The installation size of the offline help in English is approximately 75 MB.

CODESYS Development System 3.5 SP20 or higher is required for the installation.

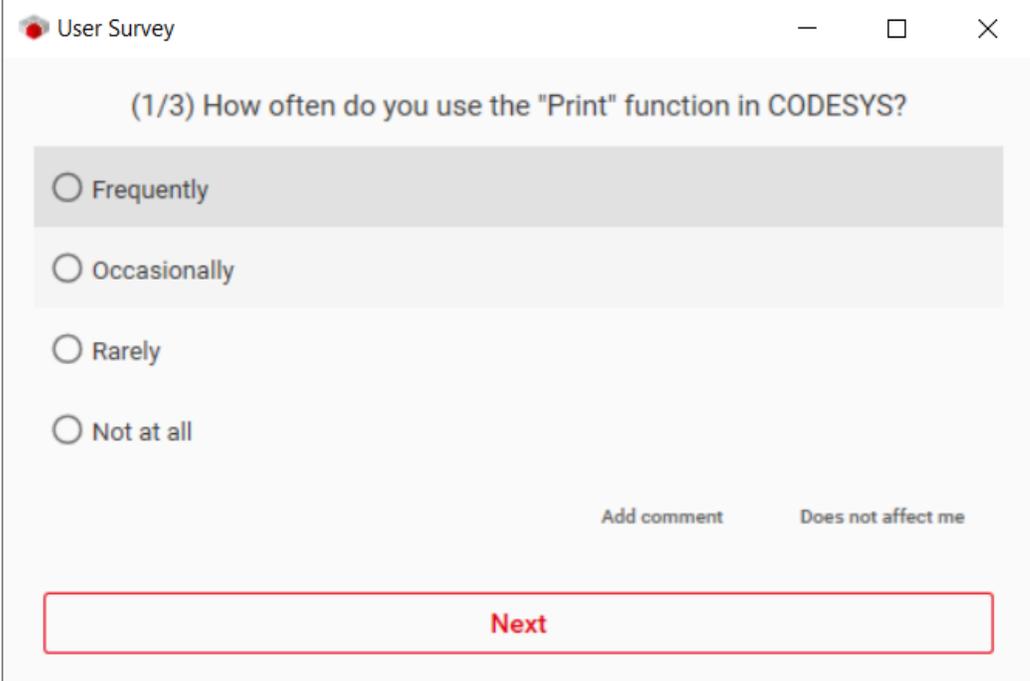
[DOWNLOAD CODESYS OFFLINE HELP](#)

Topics CODESYS Online Help



Further improvements: Integrated User Survey

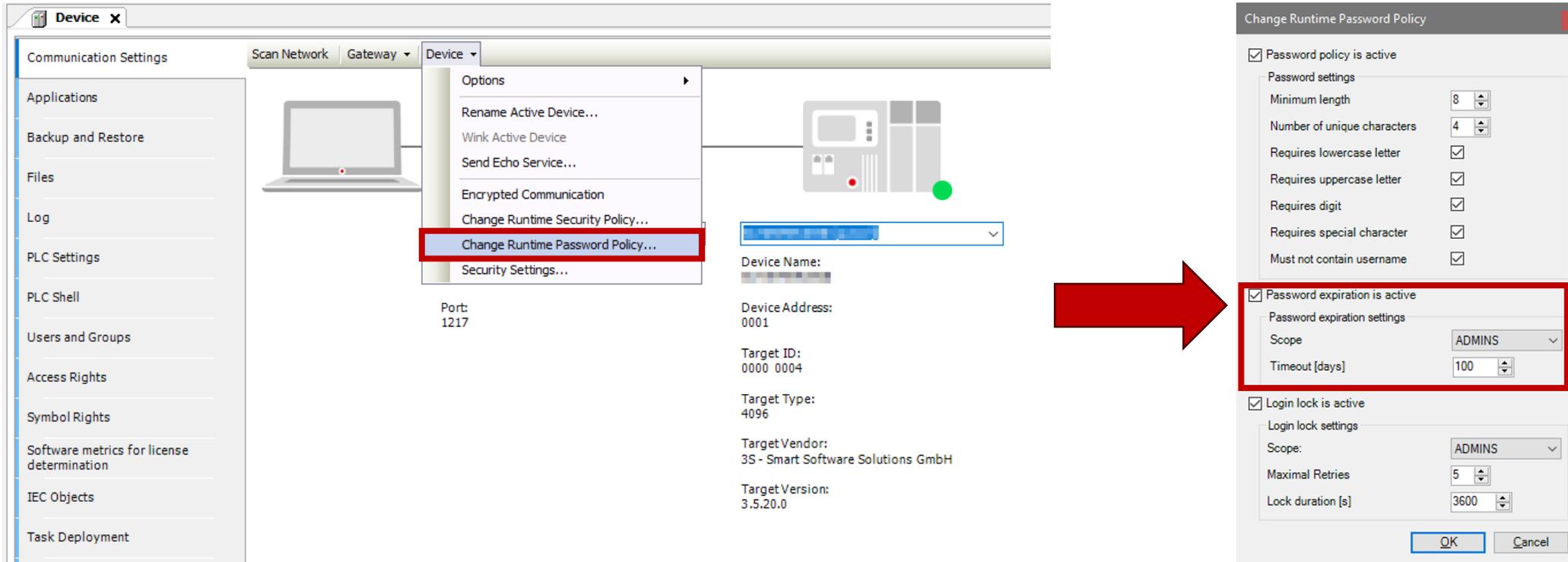
- Voluntary participation
- Anonymous data transmission
- Maximum of 3 questions every 3 weeks
- Answers influence further improvements

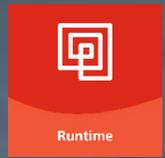


The screenshot shows a window titled "User Survey" with standard window controls (minimize, maximize, close). The main content area displays the question: "(1/3) How often do you use the 'Print' function in CODESYS?". Below the question are four radio button options: "Frequently", "Occasionally", "Rarely", and "Not at all". The "Frequently" option is currently selected, indicated by a grey background behind the radio button. At the bottom right of the form, there are two links: "Add comment" and "Does not affect me". At the bottom center, there is a red-outlined button labeled "Next".

Further improvements: Password expiration policy for Device User Management

- De-/activate and edit the password expiration for the device
- Settings designed to comply with the Chinese requirements GB40050 for critical network devices





CODESYS RUNTIME

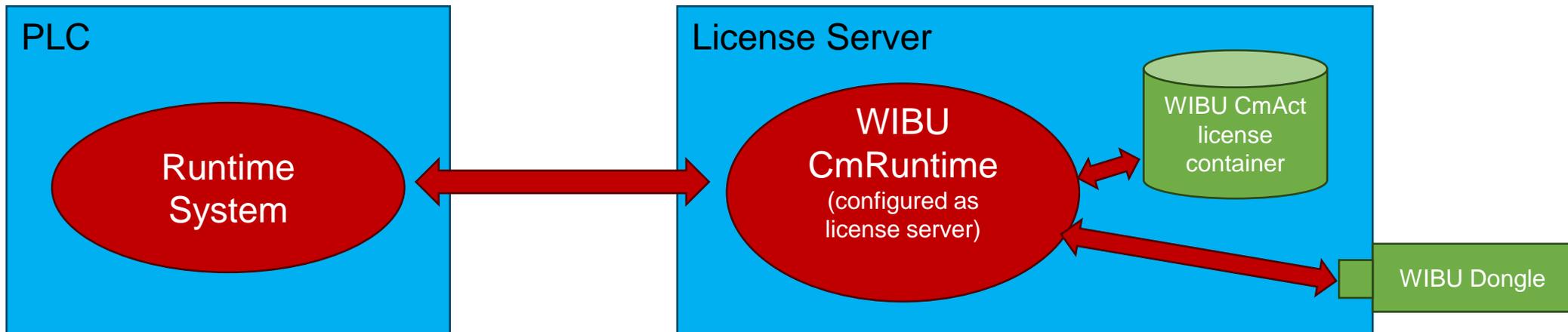
CODESYS SAFETY

Overview

- **Support of Application-Based Licenses**
- **Flow Control rework**
- **Further improvements**

Support of Application-Based Licenses

- **Application Based Licenses:**
Licensing: Depending on size and features of the running IEC application
- **Technical base for application-based licenses on license servers:**
 - Beta available in runtime system for CODESYS V3.5 SP20
 - Expected release for CODESYS V3.5 SP20 Patch1
 - License server: Windows or Linux PC
 - Use case: CODESYS Virtual Control SL (Virtual PLC)



Flow Control rework

Flow Control (recap):

- Important user feature for commissioning
- For multicore support: Multiple task synchronizations necessary in the runtime system
- Problems:
 - Performance decrease
 - Sporadic jitter on high priority IEC tasks
 - Sporadic deadlocks in special conditions

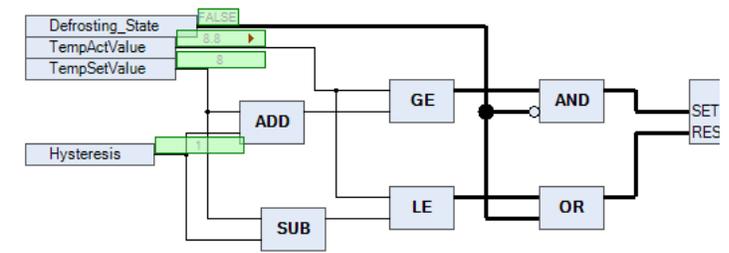
Flow Control rework:

- Rework for setting/deleting/running out of breakpoints as well as synchronization between Flow Control task and communication task
- Benefits:
 - Dramatically reduced synchronization
 - Improved performance
 - Fixed sporadic jitter
 - Fixed sporadic deadlocks
 - Improved performance for stepping

```

1 //Read high res system time
2 //GVL_TimeMeasuring.system_Sim1:=LTIME();
3 GetTime_.METH_GetTime(LTIME#0ns)();
4 GVL_TimeMeasuring.system_Sim1(LTIME#1d6h57m11s980ms67us600ns):=GetTime_.ActTime(LTIME#1d6h57m11s980ms67us600ns)
5 {warning 'Code part only for time measuring - remove for final version'}
6
7 //If cooling compressor is working, the cooling champer temperatur is continually reduced
8 IF Variables_.CoolingCompressor[TRUE] THEN
9   T1(IN[TRUE]:= Variables_.CoolingCompressor[TRUE], PT[T#500ms]:= P_Cooling[T#500ms]
10  IF xReduceTemp[FALSE] THEN
11    Variables_.TempActValue[8] := Variables_.TempActValue[8]-0.1;
12    T1(IN[TRUE]:=FALSE);
13  END_IF
14 END_IF

```



Further improvements

▪ **SysTimeRTC – Time zone access**

- New interface in SysTimeRTC to retrieve time zone information:

```
▪ typedef struct tagTimezoneInformation2
    {
        RTS_IEC_DINT utcOffsetSeconds;
        RTS_IEC_DINT isDST;
        RTS_IEC_STRING szTimezone[128];
    } TimezoneInformation2;
```

```
▪ RTS_RESULT CDECL SysTimeRtcGetTimezone2 (TimezoneInformation2 *pTZI);
```

▪ **utcOffsetSeconds**

- UTCOffset instead of Bias
- Opposite sign (UTFOffset >0 in eastern hemisphere, UTCOffset <0 in western hemisphere)
- Resolution: Seconds instead of minutes

▪ **isDST:**

- isDST=1: Daylight saving time active

▪ **szTimezone:**

- Name of the time zone (IANA time zone)

Further improvements: File Transfer Performance

- **Significantly reduced download time for applications with a large number of files**
 - Check of multiple files by one single online service check
 - Requires both CODESYS Development System and runtime version $\geq 3.5.20.0$

Further improvements: Configuration of Log filter by PlcShell Commands

- **CmpLog (recap):**

- Availability of component-specific filters since several years
- Implementation of this log filter already in several components
- Until now: Configuration only via cfg-file:
 - ```
[CmpLog]
CmpApp.Filter=0xFFFFFFFF
```

- **New PlcShell commands:**

- Management of these log filters online
  - „logsetfilter [<CmpName>...] <FilterValue>“
  - „loggetfilter [<CmpName>...]“
  - „logdelfilter [<CmpName>...]“

## Further improvements: OpenSSL

- **OpenSSL**
  - OpenSSL 1.1.1 – End of life in 2023 → No more official security fixes!
  - OpenSSL 3
    - Refactoring
    - Several security fixes
    - Open-source license: No more advertising clause!
- **OpenSSL v3.1.4:**
  - Integrated in Runtime System CODESYS V3.5 SP20
  - Support of integrated OpenSSL in operating system versions
    - 1.0.x: End of life - no device user management support
    - 1.1.1: End of life
    - 3.x: Best choice

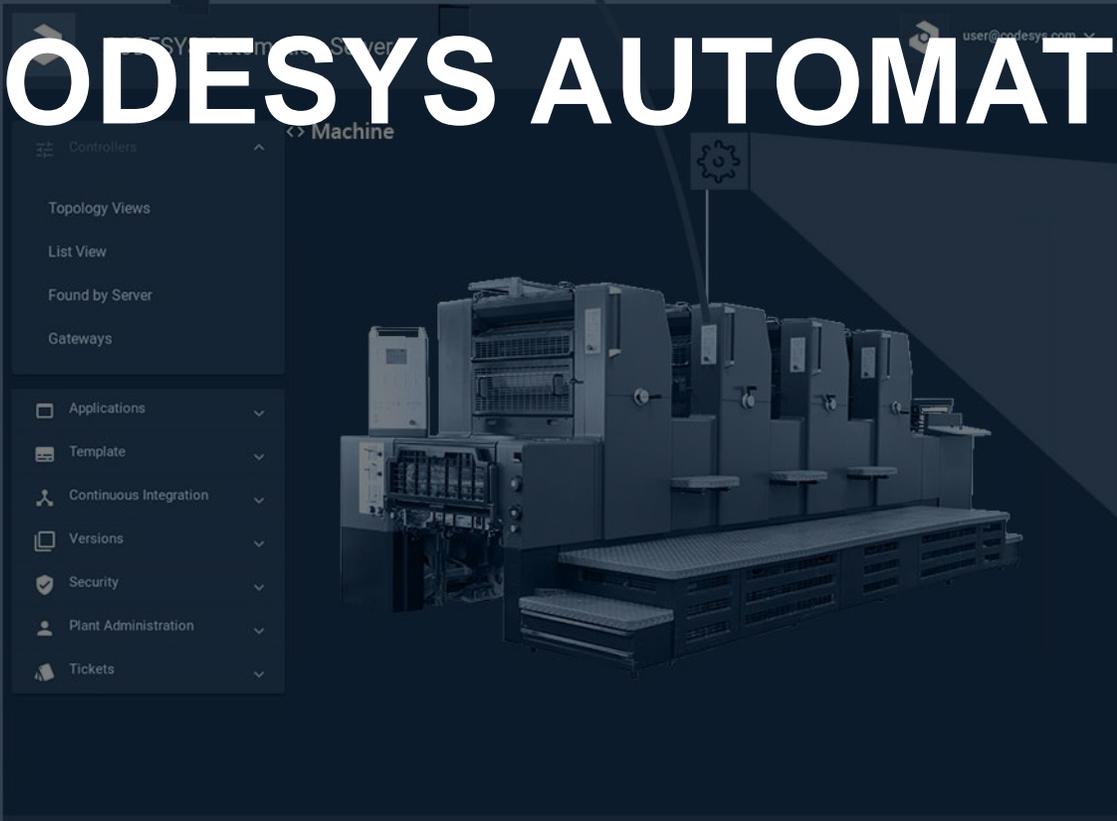
## Further improvements: Ethernet Adapter Configuration

- **Generic configuration of used ethernet adapters**
  - Configurable list of ethernet adapters used by the corresponding server
- **Implemented in server components**
  - CmpBlkDrvTCP
  - CmpWebServer
  - CmpOPCUAServer
- **Configuration (examples)**
  - Component name as section:
    - [CmpBlkDrvTCP]
    - [CmpWebServer]
    - [CmpOPCUAServer]
  - Adapter name or IP address:
    - NetworkAdapter.0=Ethernet 1
    - NetworkAdapter.1=eth0
    - NetworkAdapter.2=192.168.100.123



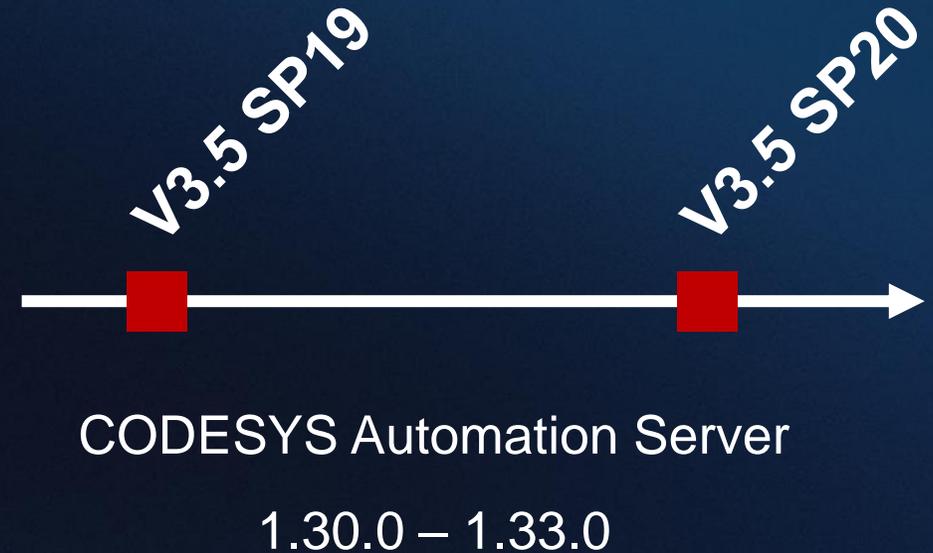
# CODESYS AUTOMATION SERVER

# CODESYS AUTOMATION SERVER



## Overview

- Device log
- CODESYS Automation Server Connector
- Start page
- Remote application control:  
Reset, start, stop
- File transfer via WebVisu
- CODESYS Edge Gateway replacement
- Edge communication rework
- On-premises, CODESYS Manager



## Device log (1.31.0)

### Requirement

- Display PLC log without necessity for
  - the CODESYS Development System,
  - a compatible project,
  - and a manually established connection to the PLC

### Solution

- Browser-based PLC log

### Your benefits

- Easy and fast to use
- Access log without CODESYS Development System
- No initial CODESYS project needed
- Connection to the PLC automatically given



- PLCs / List View
- PLCs
- Topology Views
- List View
- Network Scan
- Gateways
- Applications
- Licenses
- Template
- Tickets

List View / PLC Details: DECKERMNB

General
State Information
Configuration
Visualization
Logs
Data Analyzer Projects

×

Component
▼
Logger
▼

Severity
▼

Scroll to Latest
Refresh

| Severity                            | Timestamp ↓                    | Log                                                                                  | Logger | Component        |
|-------------------------------------|--------------------------------|--------------------------------------------------------------------------------------|--------|------------------|
| <span style="color: blue;">i</span> | 8/7/2023, 3:08:30.183 PM GMT+2 | HTTPS port : 443                                                                     | PlcLog | CmpWebServer     |
| <span style="color: blue;">i</span> | 8/7/2023, 3:08:30.183 PM GMT+2 | Connection type : HTTP, HTTPS                                                        | PlcLog | CmpWebServer     |
| <span style="color: blue;">i</span> | 8/7/2023, 3:08:30.183 PM GMT+2 | *****                                                                                | PlcLog | CmpWebServer     |
| <span style="color: blue;">i</span> | 8/7/2023, 3:08:30.180 PM GMT+2 | Visuinitialization done.                                                             | PlcLog | IECVisualization |
| <span style="color: blue;">i</span> | 8/7/2023, 3:08:30.173 PM GMT+2 | Visuinitialization starting.                                                         | PlcLog | IECVisualization |
| <span style="color: blue;">i</span> | 8/7/2023, 3:08:30.173 PM GMT+2 | CODESYS Control ready                                                                | PlcLog | CM               |
| <span style="color: blue;">i</span> | 8/7/2023, 3:08:30.171 PM GMT+2 | Application [<app>Application</app>] started                                         | PlcLog | CmpApp           |
| <span style="color: red;">!</span>  | 8/7/2023, 3:08:30.169 PM GMT+2 | Invalid UFT-16 character in SysTarget setting NodeNameUnicode                        | PlcLog | CmpSettings      |
| <span style="color: red;">!</span>  | 8/7/2023, 3:08:30.167 PM GMT+2 | Invalid UFT-16 character in SysTarget setting NodeNameUnicode                        | PlcLog | CmpSettings      |
| <span style="color: blue;">i</span> | 8/7/2023, 3:08:30.163 PM GMT+2 | Setting router <instance>0</instance> address to <address>(03a3)</address>           | PlcLog | CmpRouter        |
| <span style="color: blue;">i</span> | 8/7/2023, 3:08:30.163 PM GMT+2 | Setting router <instance>1</instance> address to <address>(0001)</address>           | PlcLog | CmpRouter        |
| <span style="color: blue;">i</span> | 8/7/2023, 3:08:30.163 PM GMT+2 | Setting router <instance>2</instance> address to <address>(2ddc:c0a8:63a3)</address> | PlcLog | CmpRouter        |
| <span style="color: blue;">i</span> | 8/7/2023, 3:08:30.161 PM GMT+2 | Bootproject of application [<app>Application</app>] loaded                           | PlcLog | CmpApp           |
| <span style="color: blue;">i</span> | 8/7/2023, 3:08:30.160 PM       |                                                                                      |        |                  |

Items per page

100

1 - 100 of 215

Severity

- i Debug
- i Info
- ! Warning
- ! Error
- ! Exception

Select all

- i Debug
- i Info
- ! Warning
- ! Error
- ! Exception

## Automation Server Connector facelift (1.31.0)

### Requirement

- Unambiguous icons and menu commands
- Clear integration into the CODESYS Development System

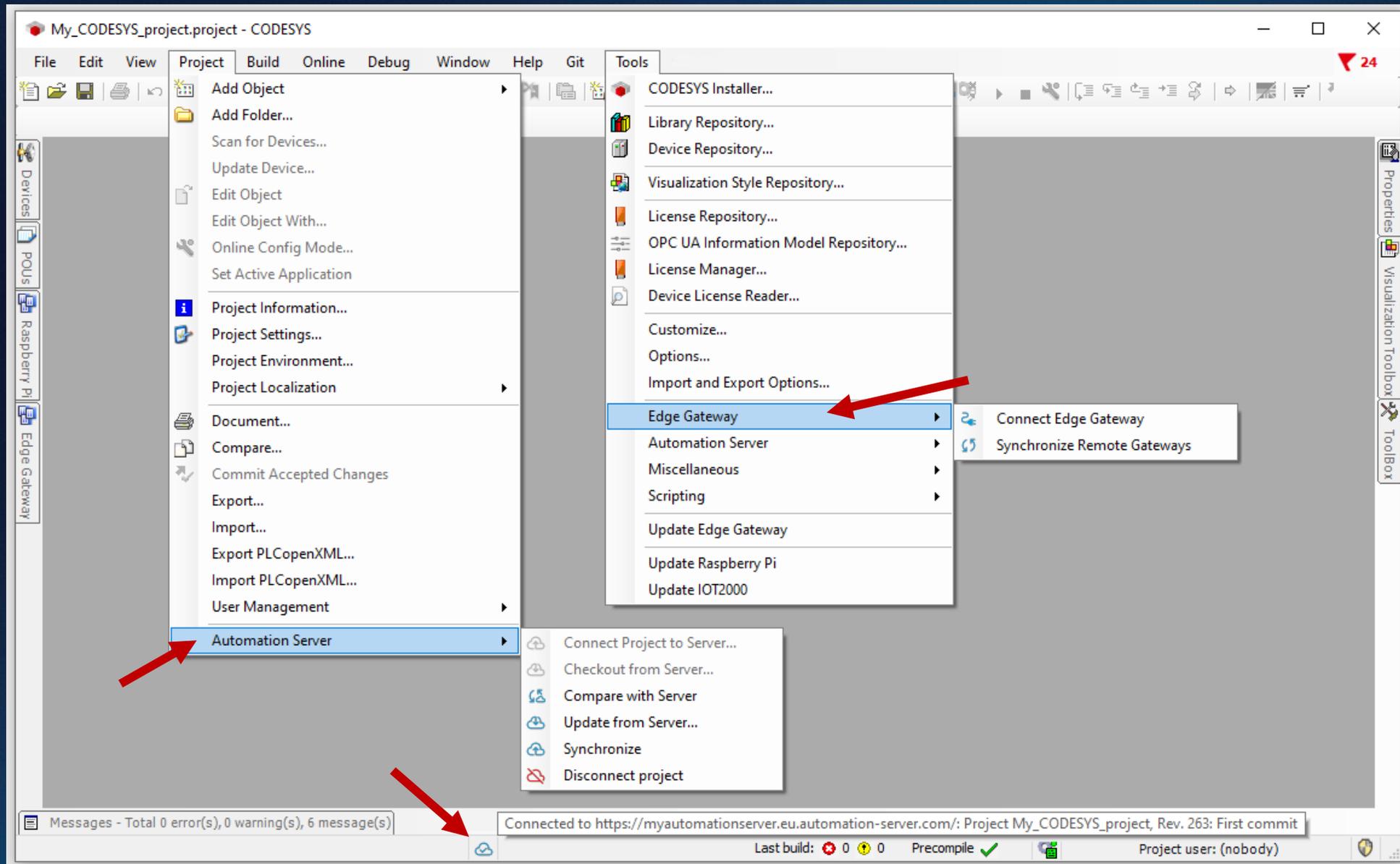
### Solution

- Redesign based on Google Material Icons
- Intuitive coloring

### Your benefits

- Immediately understandable menu items
- Clear status icons





## New start page (1.31.0)

### Requirement

- Better overview of functions and features
- Getting started more easily

### Solution

- New, three-section start page
- First steps, basic and advanced features
- Getting started with the Data Analyzer
- Help section

### Your benefits

- Guided onboarding
- Quick overview of important functionalities
- Direct cross-references to specific help topics



## Getting started and beyond

## All about help topics

CODESYS Automation Server

en m.decker

- PLCs
- Applications
- Licenses
- Template
- Tickets

### My PLCs, Projects, and more

**Basic** Advanced Features

With the CODESYS Automation Server, you manage your PLC landscapes together with the associated projects and applications. The following steps form the basis for this:

- [Connect Edge Gateways to the CODESYS Automation Server](#)
- [Connect PLCs to the CODESYS Automation Server](#)
  - [To the network scan](#): Scan for PLCs
  - [To the list view](#): Overview over connected PLCs
- [Upload projects and boot applications](#)
  - [To the project list](#): Overview of all connected projects and boot applications
- [Load applications on PLCs](#)
  - [To the project list](#): Applications of a project

Once PLCs are connected to the CODESYS Automation Server and applications are deployed, numerous other CODESYS Automation Server functions are available to you.

→ [Advanced Features](#)

### My PLC Data

With the Data Analyzer of the CODESYS Automation Server you can quickly and easily create comprehensive dashboards to display your PLC data.

Core features:

- Simply drag & drop variables onto dashboards
- Write variables
- Record and export data
- Analyze data
- Link variables between several PLCs

[How to get started](#)

[Click here to go directly to your Data Analyzer](#)

### Getting Help

- Each page and each dialog is marked with a <sup>?</sup> symbol that takes you directly to the appropriate place in the documentation.
- [Detailed documentation on the CODESYS Automation Server.](#)
- Directly ask questions to the CODESYS community in [CODESYS Talk](#).
- [Information on changing passwords.](#)

## Remote application control: reset, start, stop (1.33.0)

### Requirement

- Remote change of the execution state of a PLC
- Display of applications on the PLC
- No need for the CODESYS Development System
- No need to log in to a PLC

### Solution

- Control panel to start, stop and reset applications in defined ways directly from the browser

### Benefits

- Application control by any device with a browser
- High time savings





**List View**

Applications

CODESYS Projects

Schedules

Licenses

Template

Tickets

| Name ↑                                | Version   | Status | Project                 | Commit                   | Sync | Actions      |
|---------------------------------------|-----------|--------|-------------------------|--------------------------|------|--------------|
| <a href="#">DevVmVirtualControl</a>   | 4.9.0.0   | 🔴      | <a href="#">NewHugo</a> | new commit ...           | 🔄    | ⚙️ 📄 🔒 🗑️ ☑️ |
| <a href="#">EdgeRework_VControl13</a> | 4.9.0.0   | 🔴      | <a href="#">NewHugo</a> | new commit ...           | 🔄    | ⚙️ 📄 🔒 🗑️ ☑️ |
| <a href="#">EdgeRework_VControl14</a> | 4.9.0.0   | 🔴      | <a href="#">NewHugo</a> | new commit ...           | 🔄    | ⚙️ 📄 🔒 🗑️ ☑️ |
| <a href="#">EdgeRework_VControl15</a> | 4.9.0.0   | 🔴      | <a href="#">NewHugo</a> | new commit ...           | 🔄    | ⚙️ 📄 🔒 🗑️ ☑️ |
| <a href="#">schiess-developer-vm</a>  | 4.9.0.0   | 🟢      | <a href="#">NewHugo</a> | new commit ...           | 🔄    | ⚙️ 📄 🔒 🗑️ ☑️ |
| <a href="#">SCHIESSMANB</a>           | 3.5.19.50 | 🟢      | <a href="#">NewHugo</a> | added complex symbol ... | 🔄    | ⚙️ 📄 🔒 🗑️ ☑️ |

Manage Applications

Items per page 25 1 - 6 of 6

**Manage Applications**

PLC State ? Application Project Commit

Execute Clear

|                                      |   |                                 |                         |                          |                |
|--------------------------------------|---|---------------------------------|-------------------------|--------------------------|----------------|
| <a href="#">schiess-developer-vm</a> | 🟢 | <a href="#">Application</a> ⓘ ⏴ | <a href="#">NewHugo</a> | new commit ...           | Stop ▾ 📄       |
| <a href="#">SCHIESSMANB</a>          | 🟢 | <a href="#">Application</a> ⓘ   | <a href="#">NewHugo</a> | added complex symbol ... | Reset Warm ▾ 📄 |

Items per page 25 1 - 2 of 2

## File transfer via remote WebVisu (1.33.0)

### Requirement

- Transfer files securely between PLC and remote WebVisu client

### Solution

- Remote file transfer via WebVisu allowed for runtime version  $\geq 3.5.18.0$
- Configuration prerequisite:  
[CmpWebServerHandlerV3]  
AllowFileTransferServices=1

### Benefits

- Easy remote file exchange via WebVisu
- Secure due to binding to device user management



## Visu File Transfer Example

Transfer type File

**VISU TO PLC**

Transfer Control Flags (VISU\_TC)

- UseOriginalFileName
- ConfirmFileOverwriteInPlc

FileName

VisuData/dummy.txt

**PLC TO VISU**

active:

successful:

error:

error code: 6

Transfer type Streaming

**VISU TO PLC**

Transfer Control Flags (VISU\_TC)

- UseOriginalFileName

FileName

testdatei.txt

**PLC TO VISU**

active:

successful:

error:

error code: 0

Choose file to transfer...

## CODESYS Edge Gateway replacement (1.33.0)

### Requirement

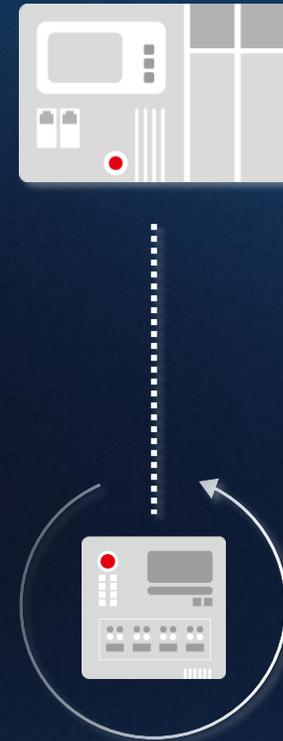
- Move PLC to another or new Edge Gateway
- Keep existing Edge Gateway

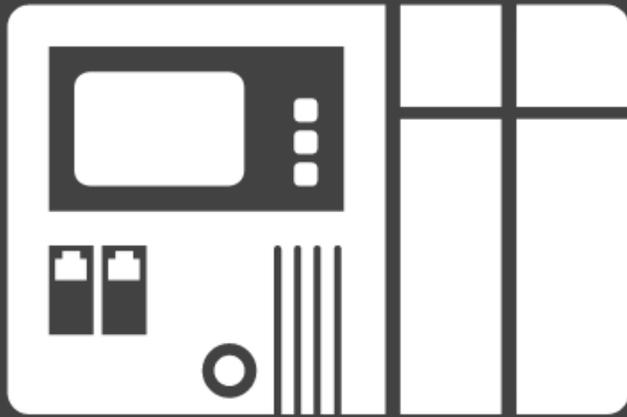
### Solution

- Edge Gateway change via drop-down menu

### Benefits

- Keep existing PLCs despite changes to connection or name
- Easy transition from test to productive operation





  Debug mode

New tag



General    State Information    Configuration    Analyzer Projects

### Testrack\_1\_PLC

#### PLC Information

Device name    DECKERMNB   
Gateways        Edge\_MDe\_local\_3.5.18.0

Serial number    00978600-83968B3A-536C5887-16...  
Connection state    Disconnected

#### Device Identification

**Name**            CODESYS Control Win V3 x64  
**Vendor**          3S - Smart Software Solutions GmbH  
**Device type**     Programmable  
**Firmware version**    3.5.18.0  
**Runtime version**    3.5.18.0  
**Target ID**         4



### Testrack\_1\_PLC

#### PLC Information

Device name    DECKERMNB

Gateways        Edge\_MDe\_local\_3.5.18.0 

 Search  

- Office\_Gateway
- My new Gateway
- PiHome
- MDe\_NB\_local
- Edge\_MDe\_local\_3.5.18.0** 

## Edge communication rework (1.32.0, 1.33.0)

### Requirement

- State-of-the-art communication service between Automation Server and Edge Gateways
- Higher scalability
- Better maintainability

### Solution

- Complete re-implementation of the service

### Your benefits

- Increased stability
- Easier extensibility



## CODESYS Automation Server on-premises + CODESYS Manager (work in progress)

### Requirement

- Full control over infrastructure and data
- Air gap operation
- Compliance with defined security requirements

### Solution

- Locally self-hosted CODESYS Automation Server

### Your benefits

- Full control (and responsibility) over the entire system
- Independence from third parties
- No internet connection necessary





# CODESYS VISUALIZATION

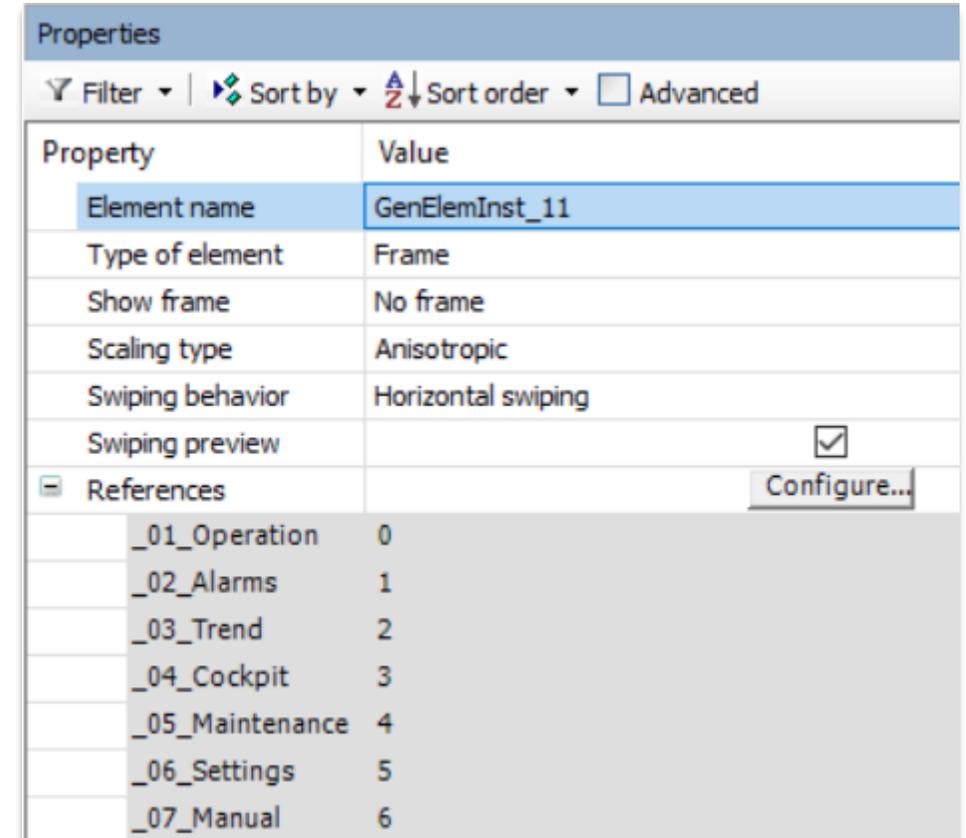


## Overview

- **Swiping frames**
- **Snaplines in visualization editor**
- **Container size**
- **Alarm definition for types**
- **Blinking of elements**

## Swiping frames

- **Swiping of pages now supported**
  - Enabling of multitouch mandatory
  - Currently available for WebVisu
  - Easy to configure
- **Demonstration with screen recording:**  
See <https://youtu.be/A9aBYiGyUkY>

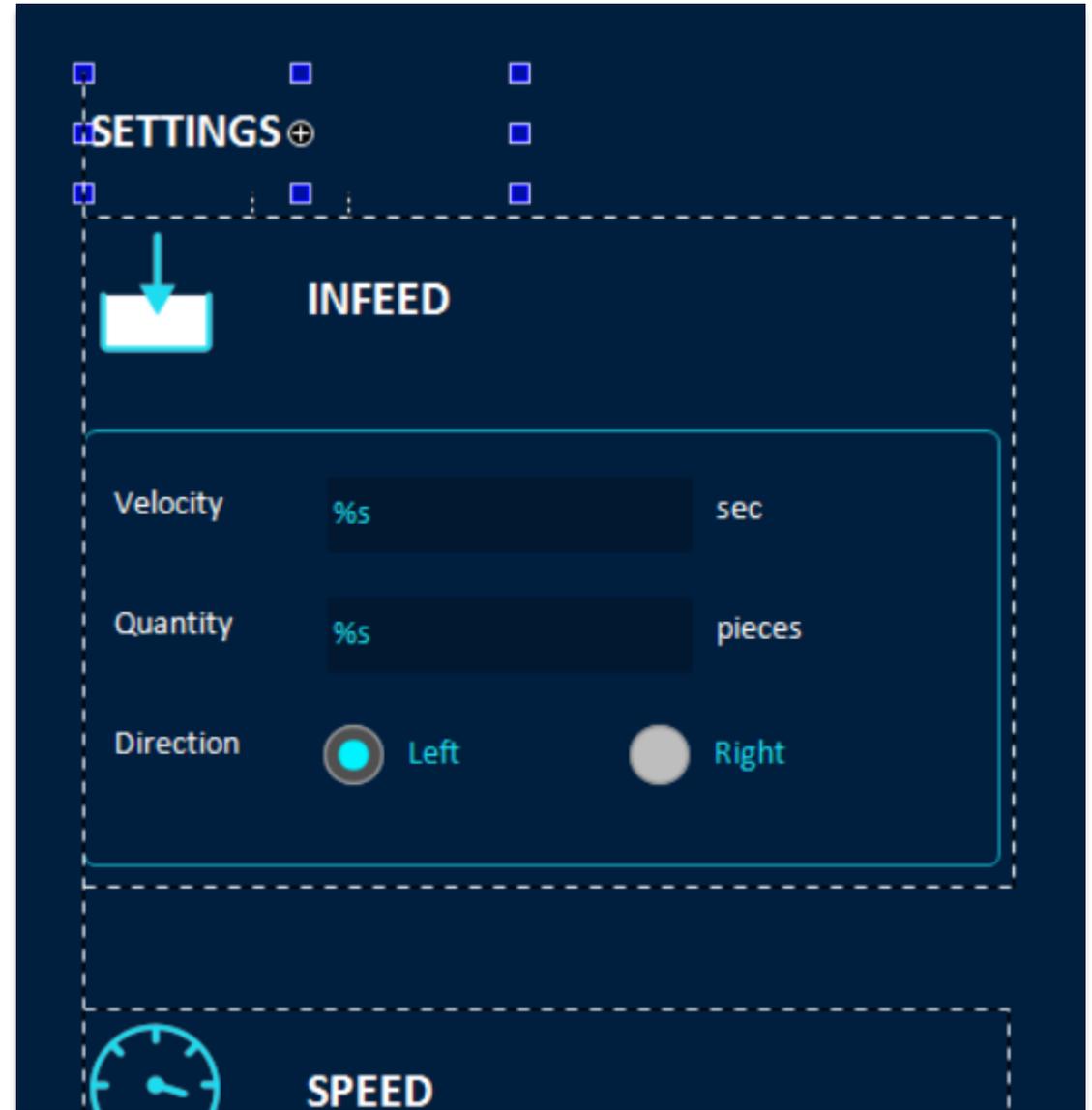
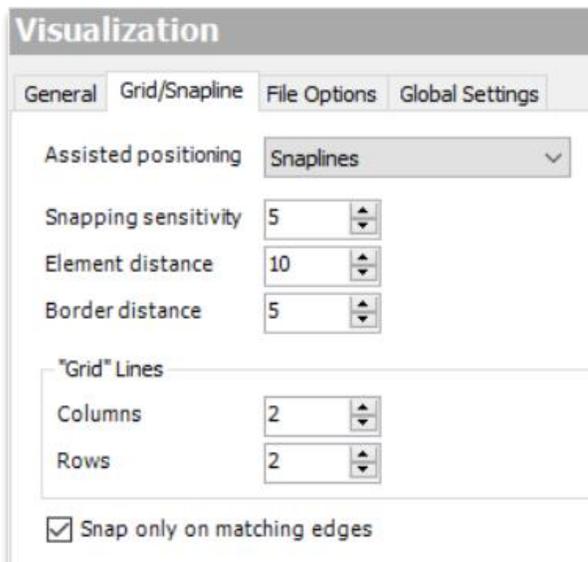


The screenshot shows the 'Properties' panel for an element named 'GenElemInst\_11'. The panel includes a table of properties and a 'References' section. The 'Swiping behavior' is set to 'Horizontal swiping', and 'Swiping preview' is checked. A 'Configure...' button is visible next to the 'Swiping preview' checkbox.

| Property         | Value                               |
|------------------|-------------------------------------|
| Element name     | GenElemInst_11                      |
| Type of element  | Frame                               |
| Show frame       | No frame                            |
| Scaling type     | Anisotropic                         |
| Swiping behavior | Horizontal swiping                  |
| Swiping preview  | <input checked="" type="checkbox"/> |
| References       | <a href="#">Configure...</a>        |
| _01_Operation    | 0                                   |
| _02_Alarms       | 1                                   |
| _03_Trend        | 2                                   |
| _04_Cockpit      | 3                                   |
| _05_Maintenance  | 4                                   |
| _06_Settings     | 5                                   |
| _07_Manual       | 6                                   |

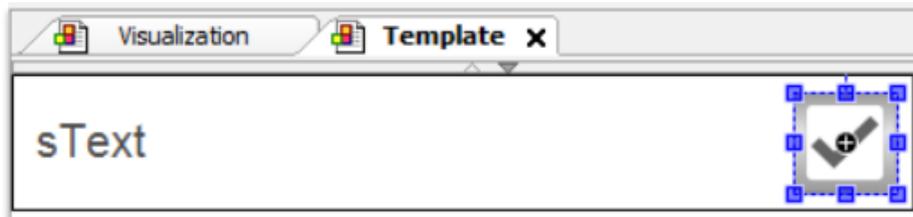
## Snaplines in the Visualization Editor

- Simple positioning of elements with the help of snaplines
- Configuration of default distance to other elements possible
- Demonstration with screen recording: See <https://youtu.be/IUJDH-qxHsk>



## Container size

- Usage: Positioning of elements in a referenced visualization of a frame depending on the frame size
- Mandatory: Property “Scaling type” in the frame element with value “Fixed”



## Alarm definition for types

- Now possible: Alarm definitions for a specific type (function block or structure)
- Type definition in project or in a library
- New objects *AlarmGroupTemplate* and *AlarmClassTemplate*

The screenshot shows the 'Alarm Configuration' window for a 'testAlarmGroup'. It features a 'Text list' dropdown set to 'testAlarmGroup', a 'Deactivation' field, and a 'Type for alarm definition' section with 'inst' and 'fb\_1' selected. Below is a table with one row of alarm data.

| ID | Observation Type              | Details                       | Deactivation | Class     | Message        | Min. Pend. Time | Latch Var 1                |
|----|-------------------------------|-------------------------------|--------------|-----------|----------------|-----------------|----------------------------|
| 0  | Digital                       | (inst.xAlarm) = (TRUE)        |              | testAlarm | Alarm occurred |                 | Reserved for instance name |
|    | Click here to add a new alarm | Click here to add a new alarm |              |           |                |                 |                            |

## Alarm definition for types

- Possibility to add alarms from instances of types to the alarm configuration with a call to “Create or update alarm instances”
- Significantly less configuration effort
- Optional: Configuration of the instances to be part of a specific alarm group

Alarm Instances

| Variable     | Alarm Group Template | Alarm Group                                                                                           | Create                              |
|--------------|----------------------|-------------------------------------------------------------------------------------------------------|-------------------------------------|
| PLC_PRG.dut1 | DUT_AGT              |  AlarmGroupInstance | <input checked="" type="checkbox"/> |
| PLC_PRG.fb1  | FB_AGT               |  AlarmGroup         | <input type="checkbox"/>            |
| PLC_PRG.fb2  | FB_AGT               |  AlarmGroupInstance | <input type="checkbox"/>            |
| PLC_PRG.fb3  | FB_AGT               |  AlarmGroupInstance | <input checked="" type="checkbox"/> |
| PLC_PRG.fb4  | FB_AGT               |  AlarmGroupInstance | <input checked="" type="checkbox"/> |

Check alarm instances during compilation

## Blinking of Elements

- New configuration option for base elements, buttons, text fields, and image switcher



- Configuration of blink interval
- Blink colors defined by normal and alarm state of the element
- Execution of the blinking: completely in the client  
→ CPU load in the controller is NOT increased



# CODESYS MOTION CNC ROBOTICS

## Overview

- **Trigger points on the path to robotics**
- **Override functionality for single axis function blocks**
- **New drivers for CODESYS SoftMotion**
- **Further improvements**

## Trigger points on the path to robotics

- **Similar to h-functions in CODESYS CNC support**
- **Possibility to create trigger points for movements using**
  - a relative position
  - an absolute distance
  - the intersection with a plane
- **Possibility to query the trigger in advance within a configurable duration of the forecast**
- **Report of the precise duration remaining until the trigger is reached**
- **Further information:**  
[https://content.helpme-codesys.com/en/CODESYS%20SoftMotion/\\_sm\\_digital\\_switches-html.html](https://content.helpme-codesys.com/en/CODESYS%20SoftMotion/_sm_digital_switches-html.html)

## Override functionality for Single Axis function blocks

- **New function block MC\_SetOverride:**
  - Adaptation of dynamics (velocity, acceleration, and jerk) of the active and future movements
  - Allows to
    - temporarily stop a movement →  $VelFactor = 0$
    - execute with reduced dynamic values (e.g. to check new movement sequences)
- **Adaptation of the dynamics / trajectory effect directly in the same cycle**
- **Further information and example:**  
[https://content.helpme-codesys.com/en/CODESYS%20SoftMotion/\\_sm\\_adjust\\_dynamics.html](https://content.helpme-codesys.com/en/CODESYS%20SoftMotion/_sm_adjust_dynamics.html)

## New drivers for CODESYS SoftMotion

- **Now supported:**
  - Bosch Rexroth ctrlX DRIVE over CoE
  - WEG SCA06



## Further improvements (excerpt)

- **MC\_GearInPos, MC\_GearIn, MC\_Cam:** Handle situation if motion FB of master axis is called later in the cycle
- **SMC\_GroupReadRemainingTrajectoryDuration** for querying the remaining duration of a trajectory
- Improved models for the CODESYS Depictor
- **SMC\_GroupReadPositionInMovement** for querying the current relative position in a movement  
→ Result can be used for teaching trigger points.
- **SMC\_Xinterpolator:** Intersection support of helix with arbitrary planes
- Reduced memory usage of the axis group by reduced evaluation cache size (before: 39MB per axis group, now: 28 MB per axis group)



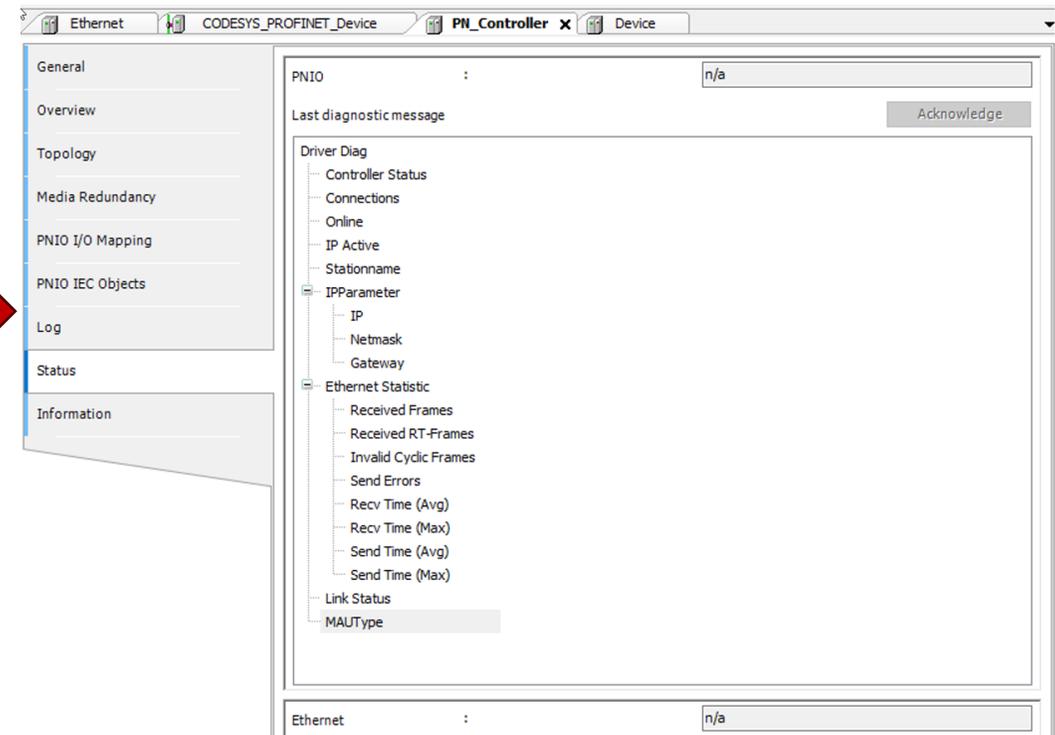
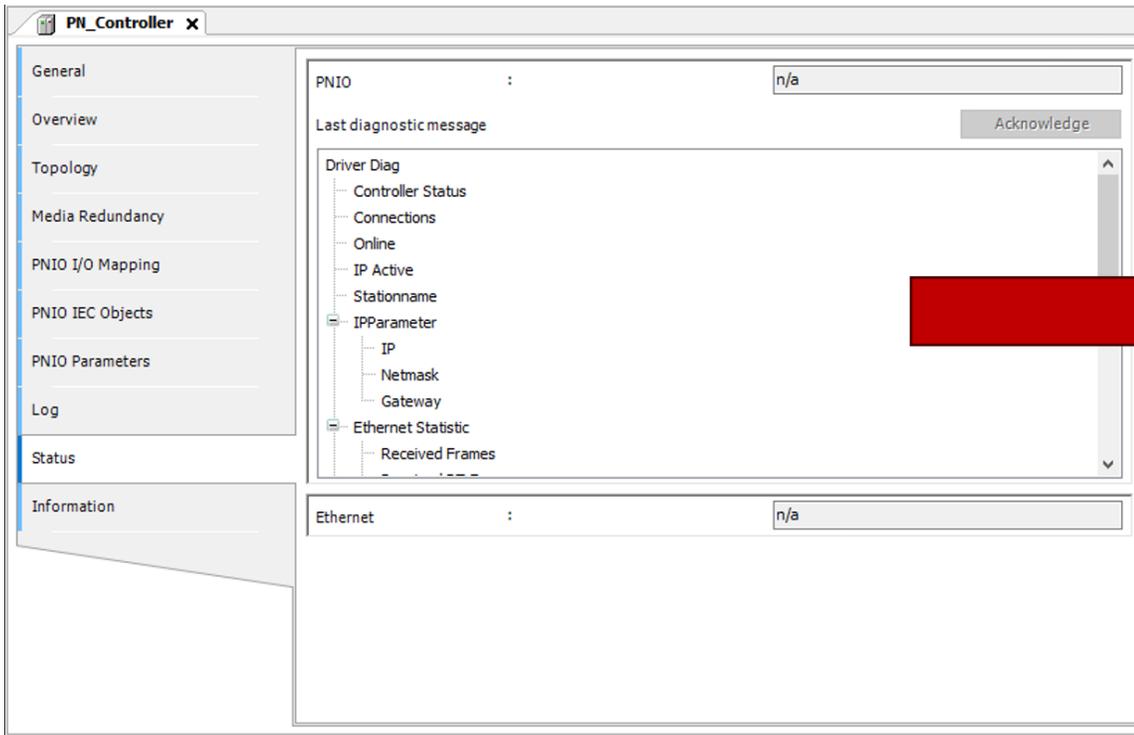
# CODESYS FIELDBUS

## Overview

- **Improvements in the device editor**
- **Specific improvements:**
  - EtherNet/IP
  - CAN (CANopen / J1939)
  - EtherCAT
  - PROFINET

## Device editor improvements

- Performance improvement for device editor tab change
- Optimized layout for status page



## Improvements for EtherNet/IP Adapter

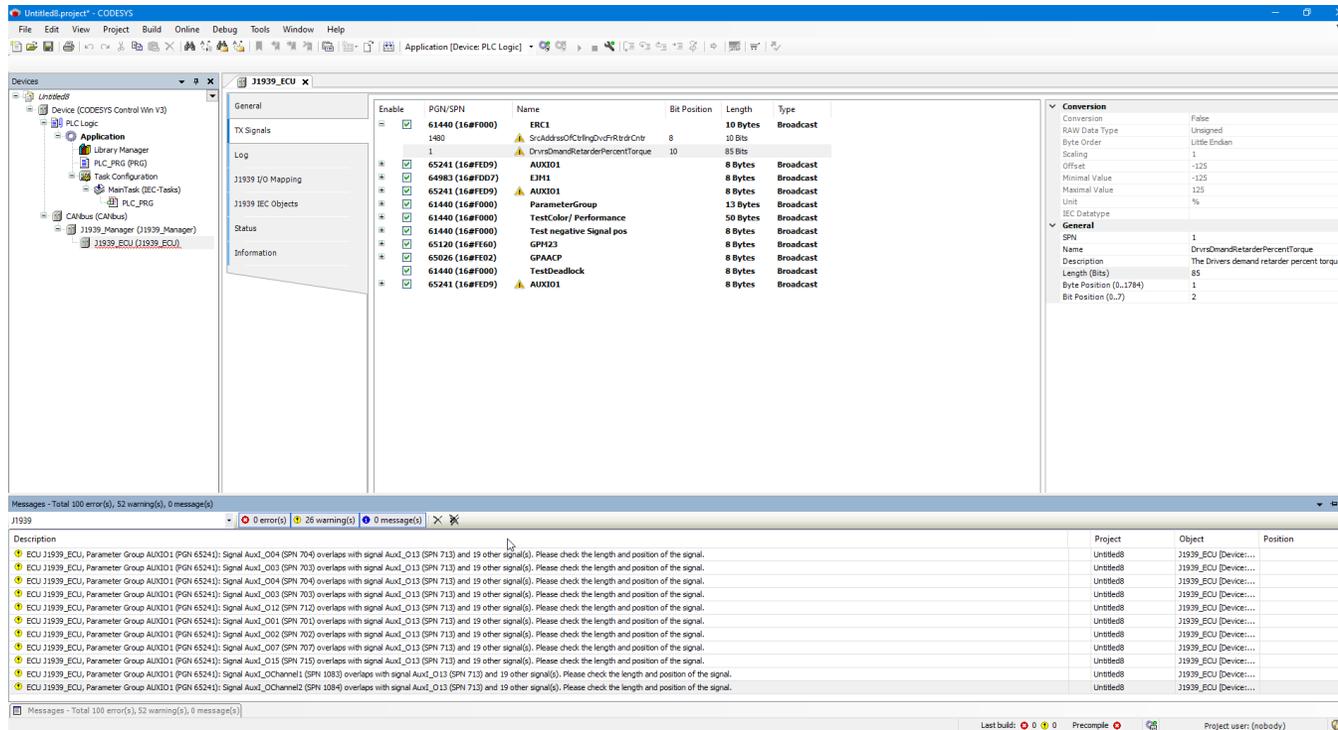
- Certification against CT19.1 and CT20 possible
- DHCP support
- API for configuration assembly

## Improvements for CANopen

- **CANopen Manager: API for changing heartbeat consumer time**

# Improvements for J1939

- **Function block API for J1939 Safety**
- **Usability improvements**
  - Copy & Paste for signals and parameter groups
  - Consistency checks for parameter groups and precompile messages



## Improvements for J1939

- **Further usability improvements:**
  - **General improvements for editing signals and parameter groups**
    - Direct editing of pgn/spn, bit position, name, length in tree table view
    - PGN:
      - shown in decimal and hexadecimal
      - can be edited/searched with hexadecimal strings

## Improvements for EtherCAT

- **Multiple bugfixes and minor improvements**

## Improvements for PROFINET

- Fast startup
- Extended port configuration



# CODESYS COMMUNICATION



## Overview

- **New product: CODESYS DNP3**
- **OPC UA improvements**
- **BACnet improvements**

## New communication product: CODESYS DNP3 SL

- **CODESYS library with IEC 61131-3 function blocks for communication via DNP3 protocol**
- **Example project for the fast execution of data transfers on CODESYS Linux controllers**
- **Configuration and communication by calling function blocks**
- **Support of numerous data types defined in the protocol**
- **Options for data exchange:**
  - Reading and writing the supported data types
  - Unsolicited response with specification of the sampling rate
- **Supported communication media:**
  - Serial connection
  - TCP/IP
- **Available in the CODESYS Store**



## OPC UA improvements

- Application of security settings and certificates without restarting the PLC
- Optimization of the service `TranslateBrowsePathsToNodeIds`
- General improvement of the browsing performance



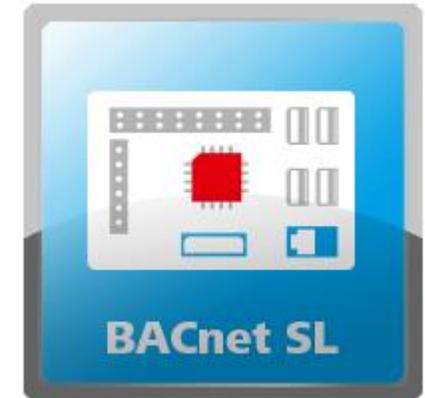
## OPC UA improvements: OPC UA Client API

- **OPC UA Client library for IEC applications:  
Encapsulation of the library CmpOPCUAClient**
- **Advantages:**
  - High-level API
  - Precondition: Supported OPC UA Client feature of the runtime system
  - All function blocks are based on Common Behaviour Model (CBML)
  - Better usability
- **Features**
  - Management of the connection to the OPC UA Server
  - Read / Write values
  - Subscribe values



## BACnet improvements

- Release of new BACnet version supporting protocol revision 23





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