CODESYS® V3.5 SP18

Features and Improvements

Including presentation of component updates since the release of the last Service Pack
Engineering
Runtime
Visualization
Motion CNC Robotics
Fieldbus
Communication
Overview

- IEC 61131-3 Editors
- Usability Features
- Security Features
- Package Manager
- Project Inspection
- Installer
- CODESYS Professional Developer Edition
- UTF-8 Encoding for Strings
- Constant Generics
- IIoT Libraries SL
IEC 61131-3 Editors

- **SFC**
  - Toggling the active step in online mode

- **ST Editor Improvements**
  - Specific display of non-compiled code
IEC 61131-3 Editors

CFC

- One-line elements (e.g. inputs, outputs, …):
  Drag and Drop by clicking on their text

- Collapsing watch boxes

- Improved usability for shortened names
Usability Features

Searching in the device logger
- Search for matching message texts
- Navigation functions and highlighting
Usability improvements

- **Device Communication Editor**
  - New checkbox: show filtered devices directly from the scan dialog
  - Update non-matching device description directly from the scan:
    - **Doubleclick** on grayed device:
      - Quick exchange e.g. from “CODESYS Control Win” to “CODESYS Control Winx64”

- **License subscriptions**
  - Automatic renewal of license subscriptions for products without user interaction
Usability improvements

- **Refactoring option 1: Click and rename**

  ![Refactoring screenshot](image1)

- **Refactoring option 2: Rename and click**

  ![Refactoring screenshot](image2)
Security Features

Certificate Handling
- Support the runtime option “sign only”
- Improve encrypted download
Security Features

Enhanced security thanks to integrated web browser based on MS Edge

Information about the security vulnerabilities CVE-2021-44228 and CVE-2021-45046 in Log4j
Security Features

Multi-Client (read-only mode):
Read-only access to already logged-in applications on one and the same controller
➔ Watch the application in online mode
➔ Write operation, start/stop not possible
Package Manager

- Replaced by CODESYS Installer in standard CODESYS installations as of SP18
  - Native Deployment Server connection
  - Automatic reference resolution
  - Requires CODESYS Installer 1.2.0 or higher
  - Package Manager still available and maintained for customer-specific CODESYS versions / derivatives

- Performance Improvements
  - Up to 30% faster package decompression
  - Up to 40% faster library installation
  - Pre-calculation of checksums
    - Up to 50% faster installation
    - Requires package optimization
    - Supported with SP18 and later
    - Compatible with SP17 and older
Package Manager

User interface improvements

- Improved presentation of modifications
- Detailed messages for unresolved dependencies
- Third-party licenses displayed
  - Package content
  - New wizard page
  - Release notes pending

SP17 and before

SP18
Project Inspection Improvements

- **New wizard concept**
  - Immediate hint if the project is not suitable for the installation
  - Wizard pages with detailed information
- **Only project-relevant content**
- **Optional add-on proposals**
- **Analysis while editing**
  - Required add-ons reported in the message view
  - Status bar indication
  - Automatic installation workflow
Installer Improvements

- **Viewer mode**
  - No admin rights required
  - No modifications possible
  - Elevation on demand

- **Bulk update for add-ons**
  - Multiple selection
  - Individual version selection
  - Bulk installation
Installer Improvements

- Installation repair function
  - Complete uninstallation of the setup
  - Reinstallation with previously configured add-ons

- Default handler for package files
  - Starts CODESYS Installer with a double click
  - Selection of a target installation
CODESYS Professional Developer Edition: CODESYS Git

Allow fast forward and merge without commit in the Git pull command

- Pulling a branch without local changes on the branch → forward of the local branch
- Remote commits added to the local branch
- No merge commit necessary
Checking server certificates

- For remotely hosted repositories to Git servers (e.g. GitLab, GitHub): server certificates check recommended
- New default setting of CODESYS Git, may be deactivated
- Option for allowing self-signed certificates on Git servers
IC Unit Test: Assisted authoring of test cases (Release July 2022)

Wizard for test case implementations

- Different templates to choose from configurable template content
- Explanatory comments
CODESYS Professional Developer Edition: CODESYS Test Manager

IEC Unit Test: Assisted authoring of test cases
Simplified result check: Assertion methods

- TM.Testcase
- TM.BaseMultiTest

```plaintext
IF (sum=0) THEN // stimulate testee
    a:=1;
    b:=2;
    sum:=a + b;
    expected:=4;
    Execute:=TRUE;
ELSE
    // check result
    AssertEqual(expected, sum);
    Execute := TRUE; // mandatory: signal test completed
END_IF
```
CODESYS Professional Developer Edition: CODESYS Test Manager

IEC Unit Test: Filter reports for functions of Test Tables
Test Script: Screenshot on timeout for ‘Remote Calls’
CODESYS Professional Developer Edition: CODESYS Test Manager for Automation Platform

Refactored Add-on packages
Pre-installation of CODESYS Test Manager now required

Test Manager packages prior to V5.0.0.0
- CODESYS Test Manager (CODESYS Store)
  - Test Manager Core
  - Test Drivers (CODESYS Store)

Test Manager packages since V5.0.0.0
- CODESYS Test Manager (CODESYS Store)
  - Test Manager Core
  - Test Drivers (CODESYS Store)
  - Activator for Test Drivers of Automation Platform

Test Manager Core
Test Drivers (Automation Platform)
Class Diagram: Improved display of POU members

- Access methods of properties
- Access modifiers of methods
- Configurable display of variables

SP17 and before
CODESYS Professional Developer Edition: CODESYS UML

True High DPI support

Interpolated 96DPI to 175% display scaling (example 4K native resolution)

True 175% display scaling (example for 4K native resolution)
CODESYS Professional Developer Edition: CODESYS SVN

Online help for Python script driver

- API documentation for script driver SVN
- Available with new online help of CODESYS V3.5.18.0
UTF-8 Support for Strings

- UTF-8 basic information
  - Encoding for Unicode
  - Characters: variable-length from 1 to 4 Bytes
  - ASCII-character set contained
  - Relatively compact
  - Very common
    - JSON
    - OPC UA
    - XML, HTML mostly encoded in UTF-8
UTF-8 Support for Strings

- **Compiler setting**

- **With activated setting:**
  - All STRING literals encoded as UTF-8
  - Monitoring: all STRING-Variables decoded as UTF-8
  - STRING-Conversion Functions: conversion from and to UTF-8
UTF-8 Support for Strings

- Independent from compile options:
  - UTF8 STRING literal
  - Monitoring attribute for STRING variables
  - Unicode character literal of type UDINT
  - Monitoring attribute for UDINT
  - New escape sequences for Unicode characters: '$u00000045'

```
PROGRAM PLC_PRG
VAR
  {attribute 'monitoring_encoding' := 'UTF-8'}
  test: STRING;
  {attribute 'monitoring_encoding' := 'UnicodeCharacter'}
  char1: UDINT;
END_VAR

test := UTF8#"ÅÄÅ";
char1 := UCHAR#"\u";
```
UTF-8 Support for Strings

- UTF-8 encoding not activated:
  ➔ New warning for non-ASCII strings
- New static analysis rule „suspicious operation on string“
  - Index access str[2]
  - ADR(str)
  - Calls to STANDARD string functions with index accesses (all but CONCAT and LEN)
- New STRING library to manipulate UTF-8 Strings
  - Concatenation and parsing much faster than with the functions of the STANDARD lib
  - Fast iteration of characters („runes“)
  - Safe manipulation of UTF8 string
  - Release for users planned for Patch 1
Constant Generics

- **Problem:**
  - A function block treats arrays of different lengths.

- **Possible solutions so far:**
  - Pass pointer to array and length
    - Problem: Consistency
  - Pass length and allocate with `SysMemAlloc`
    - Problem: When to free the memory?
  - Allocate a maximal array size
    - Problem: waste of resources
  ⇒ All solutions entail problems.

- **New solution: Constant Generic**
**Constant Generics**

### Definition / Syntax:

```plaintext
ATTRIBUTE 'monitoring display' := 'Monitoring'
ATTRIBUTE 'no_explicit_call' := 'An explicit call makes no sense'
ATTRIBUTE 'no_assign'
ATTRIBUTE 'call_after_init'

FUNCTION_BLOCK UTF8String
VAR GENERIC CONSTANT
    /// Capacity of the StringBuffer in bytes
    udiSize : UINT = 102
END_VAR EXTENDS SIR_UTF8String
VAR_INPUT CONSTANT
    /// Initial value of this instance
    sValue : STRING(udiSize);
END_VAR
VAR
    1 : UDINT;
END_VAR
```

- **Attribute to monitor the property string**
- **Size of the handled string**
  - **Used for checking the FB**
  - **Not used during compilation**
Constant Generics

- Declaration and usage:

```plaintext
PROGRAM PLC_PRG
VAR
    myString : SG.UTF8String;
    xOk : BOOL;
END_VAR

Note: Actually used size during compilation

Property string

Monitoring of the property string
```
New library included: Web Socket Client SL

Advantages of Web Socket connections
- Bi-directional connection to a webserver via the internet
- No client polling necessary due to the bi-directional connection
  => Less data traffic, fast reaction time
- Less data overhead
- Communication via standard internet ports 80 and 443 (TLS)

Features of the Web Socket Client SL library
- Unencrypted connections (ws)
- Encrypted connections (wss, configurable TLS settings)
- Configurable ping interval
- Communication via HTTP Proxy Server
- Fragmented packages

Released with IIoT Libraries SL 1.4.0.0
CODESYS IIoT Libraries

- **MQTT Client SL: Support of MQTT over Web Socket**
- **Advantages of Web Socket connections**
  - Communication via standard internet ports 80 and 443 (TLS)
  - Support of many internet MQTT brokers
  - Publish and subscribe messages over the internet
- **Features**
  - Unencrypted connections (ws)
  - Encrypted connections (wss, configurable TLS settings)
  - Communication via HTTP Proxy servers
- **Released with IIoT Libraries SL 1.5.0.0**
### CODESYS IIoT Libraries

- **MQTT Client SL: Support of MQTT V5**
- **Advantages of Web Socket connections**
  - Improved error handling for more robust systems
    - Session and message expiry
    - Predefined restrictions (maximum QoS, maximum package size…)
  - Scalability
    - Load balancing via shared subscriptions
    - Topic aliases and subscription ids to reduce message size and CPU load
  - Greater flexibility
    - User properties
    - Payload format indicators
- **Features**
  - Support of all MQTT V5.0 features (see next slide for details)
  - MQTT V5.0 and V3.1.1 support (switchable via input)
- **Release with IIoT Libraries SL 1.6.0.0**
CODESYS IIoT Libraries

- **MQTT Client SL: Supported MQTT V5 features**
  - Session expiry
  - Message expiry
  - Reason code on all ACKs
  - Server disconnect
  - Payload format and content type
  - Request / response
  - Shared subscriptions
  - Subscription ID
  - Topic alias
  - Flow control

- User properties
- Maximum packet size
- Optional server feature availability
- Enhanced authentication
- Subscription options
- Will delay
- Server keep alive
- Assigned client ID
- Server reference
AGENDA

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Overview

- CODESYS Control Extension Package
- New Reference Implementation for Embedded Runtimes
- PLCopen Safety Library for SIL2
- Runtime Toolkit – Usage of CmRuntime and AxProtector
- CodeMeter® Support
- Online Communication
- Device User Management
CODESYS Control Extension Package (1/7)

- Extension of Linux-based SoftPLCs (“SL products”) without runtime toolkit
- Overview of main use cases
  - Use existing C-Code from inside the IEC application
  - Use existing API from inside the IEC application (function call)
  - Support local/remote IOs from inside the IEC application
  - Support retain memory
  - Support run/stop switch
  - Trigger external event
  - Register to application events
  - Configure runtime/application (local PLC shell access)
- Release based on SDK SP17 P3

Included free of charge in Linux-based SoftPLC packages in the CODESYS Store
CODESYS Control Extension Package (2/7)

Use case: Use existing C-Code from inside the IEC application

- Create own runtime component (shared object)
- Uses „standard“ mechanism for externally implemented function
- Can be created with Extension SDK (minimal subset from runtime SDK)
- Can be used with/without „C-Code Integration“ plug-in (transport via IEC library)
- Restrictions:
  - No access to runtime interfaces
  - No direct access to IEC application / variables
  - No debugging from CODESYS IDE
  - Only C code
  - Direct impact on runtime process (no process separation)
CODESYS Control Extension Package (3/7)

Use case: Use existing API/IO from inside the IEC application (function call)

- With process separation based on Unix domain sockets
- Client can be any technology (example available in Python / C).
- Extension IEC Library provides base FB to realize external function call (Extension API).

  Performance: < 50us roundtrip per call

- Generic IO driver based on base FB for simple IOs (IoDrvSocketUnix)
CODESYS Control Extension Package (4/7)

Use case: Trigger external event tasks / register to application events

- Runtime component providing Unix domain sockets triggering of external event tasks

- Register to and receive callback for IEC application events such as application start / stop / exception / reset / exit / bootappsloaded

```
socat - UNIX-CLIENT:/var/run/codesyscontrol/eventtasks/MYEVENT1.sock
```
CODESYS Control Extension Package (5/7)

Use case: Support retain memory

- Standard CmpRetain mechanism (nothing SL specific)
  - Configuration „Retains in shared memory“

[CmpApp]
RetainType.Applications=InSHM

[CmpRetain]
Retain.SHM.Size=0x1FFFF
Retain.SHM.Name=MyRetainMemory

⇒ „Public“ shared memory is created and can be used or mounted to file-/devicedriver etc.
Use case: Support run/stop switch*

- Runtime component providing generic run/stop switch mechanism
  - Text file based
    - `/var/opt/codesysextension/runstop.switch`

- easy to use, e.g. from command line
  - `echo "RUN" > /var/opt/codesysextension/runstop.switch`
  - `echo "STOP" > /var/opt/codesysextension/runstop.switch`

* Not supported on hardware that has „real“ run/stop switch (e.g. PLCnext / PFC etc.)
Use case: Support PLC Shell

- Runtime component providing access to runtime PLC Shell
  - Based on Unix domain sockets
  - Anonymous user must be activated in User Management settings

- Example command line:
  ```
  socat - UNIX-CLIENT:/var/run/codesyscontrol/plcshellsock
  ```
Reference Implementation for Embedded Runtimes

- **STM32H753I-EVAL (Cortex M7 480MHz)**
  - Reference implementation valid for the whole board family

- **Environment: STM Cube IDE (free)**
  - Binary for demo purposes available

- **Implemented Features**
  - Timer Scheduler with FreeRTOS
  - Hardware breakpoints and exception handling
  - Flash driver for IEC application
  - Lightweight IP stack (LwIP) for CODESYS communication
  - COM / USB driver supported

- **Pending**
  - Target Visu Light / Embedded
  - SysEthernet implementation
  - CAN driver
PLCopen Safety Library for SIL2

- PLCopen specification version 2.01
- Usable in CODESYS Safety SIL2 applications
- Implemented function blocks
  - SF_Eqivalent
  - SF_Antivalent
  - SF_EmergencyStop
  - SF_EDM
  - SF_ResetButton
Runtime Toolkit – Usage of CmRuntime and AxProtector

- **Up to SP18**
  - Use of CmEmbedded very complex for device manufacturers
    - Providing a secure serial number on the target
    - FMEA to safeguard the runtime system (encryption/signing)

- **As of SP18:**
  - CmRuntime can be used under Windows and Linux (inclusive UFC support).
    - SmartBind mechanism provides the secure serial number.
  - Usage of the AxProtectors for Linux platforms!
  - Protection via AxProtector for runtime implementation of device manufacturers pending
  - Description of the usage of CmRuntime and AxProtector for device manufacturers available in the Runtime System Online Help (Access to Customer portal required)
CodeMeter® Support – network licenses

- Configuration of CmRuntime as a license server
- Default IP Port 22350 must not be changed!
- Configuration of the license server in two different ways:
  - Additional entry in server search list:
  - Entry in the cfg-File of the runtime system:

```
[CmpCodeMeter]
LicenseServer.1=192.168.100.60
```
CodeMeter® Support – Unit counter licenses

- **New license type:** *UnitCount license*
- **Use case:** *Pay per use*
- **Decrementing the license counter with every access to the license**
- **New interface functions to use UnitCount licenses:**
  - Function to get the current value of the license unit counter:
    ```c
    RTS_RESULT CDECL CodeMGetUnitCounter(RTS_HANDLE hCodeMeter, RTS_UI32 *pulUnitCount)
    ```
  - Function to decrement unit count value with the specified decrement:
    ```c
    RTS_RESULT CDECL CodeMDecrementUnitCounter(RTS_HANDLE hCodeMeter, RTS_UI32 ulUnitCount)
    ```
CodeMeter® Support – IEC-application performance licenses (pending)

- Licensing of SoftPLCs (“SL runtimes”) by so called „performance licenses“
- Limitation of the IEC application issues by performance licenses:
  - Number of IEC tasks
  - IEC code size
- License feature map provides performance licenses:
  - Number of IEC tasks: ProductCode=5000, Number of IEC tasks=FeatureMap
  - IEC code size: ProductCode=5001, Codesize=FeatureMap * 1MB

Notes:
- No implicitly generated tasks or code considered in these limits!
  (Only application developer code considered)
- IEC code size / IEC tasks globally limited!
  (Calculation over the complete IEC applications on the target)
CodeMeter® Support – IEC application performance licenses

- CODESYS editor: Checking the license limits in the device dialog
  - Runtime full license available:
  - Performance license available:
CodeMeter® Support – Generic SoftPLC license check

- **Up to SP18:**
  Specific license check in every SoftPLC (“SL runtime”)

- **As of SP18:**
  Generic checks by the component manager

→ Cyclic license check / error handling now identical for all SoftPLCs
Online communication – asynchronous execution

- Asynchronous execution of all online service now activated by default
- Prerequisite:
  - CmpAsyncMgr must be available on the runtime system!
- Advantages:
  - No time limitation for long running online services (reset, download, etc.)
    - No communication timeout limit
  - No blocking of the complete communication by unhandled exceptions in Layer 7 services
Device User Management – Access from IEC application

CmpUserMgr.library:

- New interface functions to edit the users, groups and rights
- New parameter hUser: first parameter at all interface functions!
  ➔ Access to user management only after first login per UserMgrLogin() API
- Newly available interface functions:
  - UserMgrChangeMyPassword
  - UserMgrGetFirstUser, UserMgrGetNextUser
    UserMgrGetFirstGroup, UserMgrGetNextGroup
    UserMgrGetFirstGroupMember, UserMgrGetNextGroupMember
  - UserMgrAddUser, UserMgrRemoveUser
    UserMgrSetCredentials
    UserMgrSetProperty
    UserMgrAddGroup, UserMgrRemoveGroup
    UserMgrAddUserToGroup, UserMgrRemoveUserFromGroup
  - UserMgrGetFirstObject, UserMgrGetNextObject
    UserMgrObjectGetFirstChild, UserMgrObjectGetNextChild
    UserMgrObjectGetFirstGroup, UserMgrObjectGetNextGroup
    UserMgrObjectGetGroupRights
    UserMgrObjectGetName
  - UserMgrObjectAddGroup, UserMgrObjectRemoveGroup
    UserMgrObjectSetGroupRights, UserMgrObjectSetGroupDeniedRights, UserMgrObjectClearRights
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Overview

- Moveable Dialogs
- XYChart
- Trend
- Further Features and Improvements
- CODESYS Web View (free Android App)
Moveable Dialogs

- With activated overlay mode: Visualization now movable
- Movable areas:
  - Background areas
  - Element “Invisible Input” with set option “Used as pointing area”
- Last opening position: Stored for each client and for each specific dialog
Show localized texts instead of numbers for the axis labeling

- Via variable
- Directly via test list

Example:

- AxisX.wsTLNumberReplace := "Months";
- "Months" is the name of the text list
Trend

- Scrolling/zooming by touch supported
- Trend recording: Simplified configuration
Further features and improvements

- **New OnValueChanged event in element properties**
  - Reaction on changed values

- **Set maximum number of visualization clients**
  - New message in the visualization manager (Advanced Settings)
  - Target-specific device description, e.g.:
    `<ts:setting name="maximum_number_of_visualization_clients" type="integer" access="readonly">`  
    `<ts:value>3</ts:value>`

- **TabControl: Dynamic visibility for tabs by IEC variable**

- **Display of full date / time including time zone / offset in visualization or UTC**
  - New format specifier Z (f.e. +02:00 is displayed) or VisuElems.Visu_DateTime.DisplayUTC := TRUE;

- **WebVisu/Remote Target Visu: Automatic release of a tapped variable in case of lost connection to the client**
CODESYS Web View (free Android App)

- **General:**
  - Searches local wireless LAN network for web visualizations
  - Available in the Google Play Store

- **New: Support of CODESYS Automation Server**
  - Get and manage the URLs of web visualizations from the CODESYS Automation Server
  - Read device names from the CODESYS Automation Server
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Overview

- Improved CP-Tracking
- SMC_TrackSetValues
- Logical Axis: Improve filter
- SMC_GroupReadPathDynamics
- New drivers for servo drives
Improved CP-Tracking

- Easier engineering of pick & place applications
- Improved robustness – usage without tuning
- Extended functionality
- More consistent behavior
- Improved maintainability
SMC_TrackSetValues

- Single Axis FB (PLCopen Part 1)
- Follows a given reference signal.
- Respects given limits for velocity, acceleration, jerk.
Logical Axis: Improved filter

- Logical axis: can be used to smooth noisy encoder signals
- Improved noise reduction of the position signal
- PT1 filter with extrapolation, instead of a moving average
- Maximum window length extended from 15 to 1000 cycles
**SMC_GroupReadPathDynamics**

- Robotics function block to read path velocity, acceleration, and jerk

```plaintext
<table>
<thead>
<tr>
<th>AxisGroup</th>
<th>AXIS_GROUP_REF_SM3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enable</td>
<td>BOOL</td>
</tr>
<tr>
<td>CoordSystem</td>
<td>SMC_COORD_SYSTEM</td>
</tr>
<tr>
<td>[Source]</td>
<td>MC_SOURCE := MC_SOURCE.SAVE</td>
</tr>
<tr>
<td>BOOL Valid</td>
<td></td>
</tr>
<tr>
<td>BOOL Busy</td>
<td></td>
</tr>
<tr>
<td>BOOL Error</td>
<td></td>
</tr>
<tr>
<td>SMC_ERROR ErrorID</td>
<td></td>
</tr>
<tr>
<td>LREAL PathVelocity</td>
<td></td>
</tr>
<tr>
<td>LREAL PathAcceleration</td>
<td></td>
</tr>
<tr>
<td>LREAL PathJerk</td>
<td></td>
</tr>
</tbody>
</table>
```
New drivers for servo drives

- Kollmorgen MKD-N/C, AKD-N/C, AKD2G
- Panasonic A6 MultiDrive
- Nidec Unidrive
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Overview

- Symbolic access to IO channels
- EtherCAT Safety Module: New modules supported
- Building Automation Library
- Further improvements
Symbolic access to IO channels

- Direct access to all IO channels of a device through device name in the tree
- All datatypes (e.g. structures, enumerations) supported
- Working with all IO drivers without any change
- No more IO mapping in fieldbus editor required → Still supported, mixing possible
- Enabled by switch in PLC Settings or Device Description
Symbolic access to IO channels
EtherCAT Safety Module: Support of further Safety Modules

- New Beckhoff modules contain the Safety PLC logic together with I/O channels
  - EL1918: 8 digital inputs
  - EL2911: 4 digital inputs
  - EL2912: 2 digital outputs

- Programming similar to EL6910 or EK1960
  ➔ Directly in the CODESYS Development System
  ➔ Add-on component required

- Improved usability:
  Filter FBs in Toolbox / Intellisense® according to the definition in the Device Description
Building Automation Library

- Usage of Common Behaviour Model
- Time-related function blocks ("warp clock") enabled to support non-real-time testing / simulation
- Project example available
- Oriented towards VDI 3814 Bl. 3.1
- Typical use cases:
  - Primary plants (e.g. boiler plants)
  - HVAC
  - Room automation
  - Lighting control in general
  - Building management
  - Assisted facility management
- Open source, free to use
First release pending (July 2022)
Further improvements

- **PROFINET:**
  - SNMP server added to support the conformance class B

- **Ethernet/IP:**
  - Optional QoS object now supported
AGENDA

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Overview

- OPC UA Information Models
- New Symbol Configuration
OPC UA Information Models

Further OPC UA features supported

- Built-in OPC UA data types can be mapped to IEC types
  - ByteString, LocalizedText
- Translation of OPC UA state machines to IEC representation
- Declaration and usage of meta data for variables (Variable Types)
  - EURange, EngineeringUnits
OPC UA Information Models

Current state of features for information models

- Key feature ‘self describing data’ now supported
  ➔ Broader set of information models possible
- Still open: Unsupported features of complex models (e.g. for Injection Moulding Machines)
- Customer experience:
  - Successfully created prototype by means of information model with state machines and methods
  - Fast migration from open62541 server to CODESYS OPC UA
  - Very positive feedback
New Symbol Configuration

- New editor for Symbol configuration
  - Select „OPC UA Server“ Object below Communication Manager
- New workflow ➔ No compilation of application necessary
- Support of independent Symbol Sets
- Legacy symbol configuration
  - Usage in parallel to the latest editor possible
  - Exclusive support of PLCopen information model
  - Exclusive support of PLC Handler
Thank you for your attention.

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