Features & Improvements CODESYS V3.5 Service Pack 9

Agenda

1 Runtime

2 Engineering

3 Visualization

4 Motion + CNC

5 Fieldbus

6 Other

Runtime

Overview

- X.509 certificates
- Consistent monitoring via PLCHandler / IecVarAccess
- Separated provider component for CODESYS OPC UA Server
- CODESYS Control for BeagleBone SL

X.509 Certificates – Benefits in general

- Certificate:
  - Digital identification of an entity (e.g. server, user, software module)
  - Contains public key for an asymmetric method
  - Owner has associated private (secret) key for an asymmetric method
- Application for asymmetric cryptography method:
  - Encryption of messages → confidentiality
    (Transmission read by sender and receiver only)
  - Signing of messages → integrity
    (Transmission not changed / changes detected)
  - Authentication of sender and receiver → authentication
    (Detection of the identity of a user or a server)

X.509 Certificates – Integration in CODESYS

- Uniform interface for
  - Certificate management in the runtime system (RTS)
  - Use of cryptography method
  - Encrypted communication (TLS; previously SSL)
- Central component for certificates and cryptography in the RTS: **OpenSSL**
- Detection of all servers in the RTS that require a certificate
  - Now: WebServer registers a certificate for itself.
- Creation of self-signed server certificates
- PlcShell commands for certificate management
- Other integration steps in preparation

Consistent monitoring via PLCHandler / IecVarAccess

- Requirement from the process industry:
  Clock and cycle consistent monitoring
- Previous methods available:
  - No consistency
  - Defensive consistency (interruption by an IEC task is detected; errors are issued when monitoring)
- New: Offensive monitoring method
  - Values of a complete variable list from **one** cycle
  - Client and PLCHandler: Definition of the consistency method per variable list
  - Activation of the new method in the symbol configuration or device dialog
  - Effect on task jitter

OPC UA Server – Separate provider components

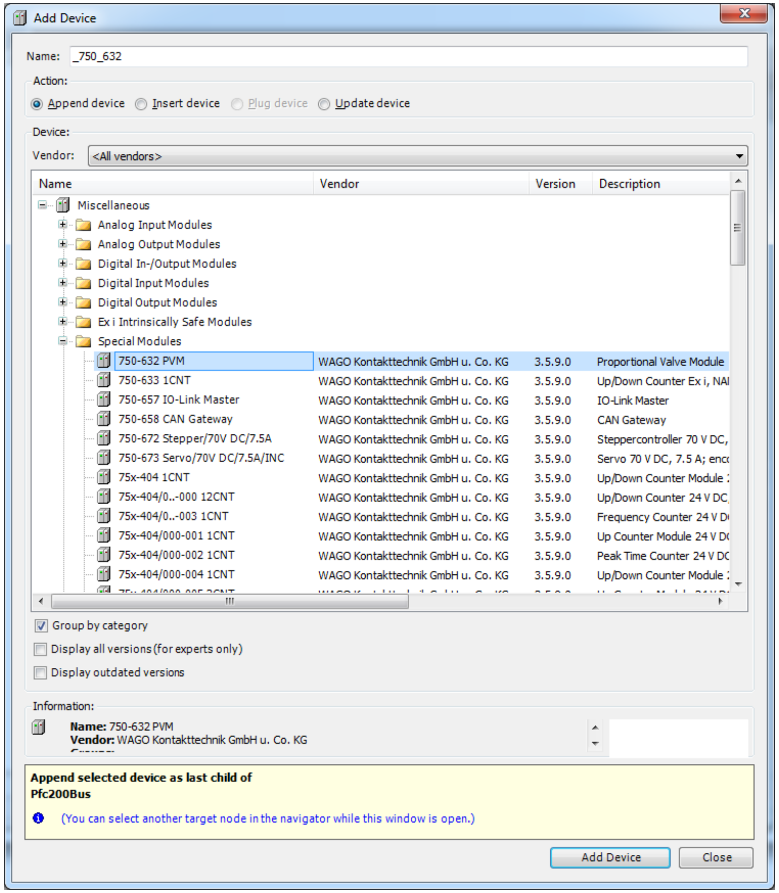
- Requirements:
  - Management of own objects in the CODESYS OPC UA server
    ➔ Extension of the OPC UA server
  - Integration of the CODESYS IecVarAccess provider in the OEM OPC UA server
- Uniform interface for linking the OPC UA provider
- IecVarAccess as standalone provider component separated
- Sample component of a provider for OEMs

CODESYS Control for BeagleBone SL

- BeagleBone Black: Single-board computer comparable to Raspberry Pi; Linux operating system (Debian)
- Ready-to-use SoftSPS available as Debian package; installation directly within the CODESYS Development System
- Supported functions: WebVisu, GPIO (analog / digital), OPC UA server, EtherCAT, EtherNet/IP, CANopen/J1939 (additional cape module required)
- Available in the CODESYS Store
- Standard delivery:
  - Debian package
  - CODESYS package
  - Tutorials for cape activation

PFC200 Support

- 750-632 modules: Support for additional specialized modules



Name: _750_632

Action:

● Append device ○ Insert device ○ Plug device ○ Update device

Device:

Vendor: <All vendors>

Name	Vendor	Version	Description
Miscellaneous			
Analog Input Modules			
Analog Output Modules			
Digital In-/Output Modules			
Digital Input Modules			
Digital Output Modules			
Ex i Intrinsically Safe Modules			
Special Modules			
750-632 PVM	WAGO Kontakttechnik GmbH u. Co. KG	3.5.9.0	Proportional Valve Module
750-633 1CNT	WAGO Kontakttechnik GmbH u. Co. KG	3.5.9.0	Up/Down Counter Ex i, NAI
750-657 IO-Link Master	WAGO Kontakttechnik GmbH u. Co. KG	3.5.9.0	IO-Link Master
750-658 CAN Gateway	WAGO Kontakttechnik GmbH u. Co. KG	3.5.9.0	CAN Gateway
750-672 Stepper/70V DC/7.5A	WAGO Kontakttechnik GmbH u. Co. KG	3.5.9.0	Steppercontroller 70 V DC,
750-673 Servo/70V DC/7.5A/INC	WAGO Kontakttechnik GmbH u. Co. KG	3.5.9.0	Servo 70 V DC, 7.5 A; enc
75x-404 1CNT	WAGO Kontakttechnik GmbH u. Co. KG	3.5.9.0	Up/Down Counter Module
75x-404/0..-000 12CNT	WAGO Kontakttechnik GmbH u. Co. KG	3.5.9.0	Up/Down Counter 24 V DC,
75x-404/0..-003 1CNT	WAGO Kontakttechnik GmbH u. Co. KG	3.5.9.0	Frequency Counter 24 V D
75x-404/000-001 1CNT	WAGO Kontakttechnik GmbH u. Co. KG	3.5.9.0	Up Counter Module 24 V D
75x-404/000-002 1CNT	WAGO Kontakttechnik GmbH u. Co. KG	3.5.9.0	Peak Time Counter 24 V DC
75x-404/000-004 1CNT	WAGO Kontakttechnik GmbH u. Co. KG	3.5.9.0	Up/Down Counter Module

☑ Group by category

☐ Display all versions (for experts only)

☐ Display outdated versions

Information:

Name: 750-632 PVM
Vendor: WAGO Kontakttechnik GmbH u. Co. KG

Append selected device as last child of
Pfc200Bus

(You can select another target node in the navigator while this window is open.)

Agenda

1 Runtime

2 **Engineering**

3 Visualization

4 Motion + CNC

5 Fieldbus

6 Miscellaneous

Engineering

Overview

- Navigator
- ST editor
- CFC editor
- Online
- Library manager
- Frame
- Project localization
- Application Composer
- Test Manager

Runtime

Engineering

Visualization

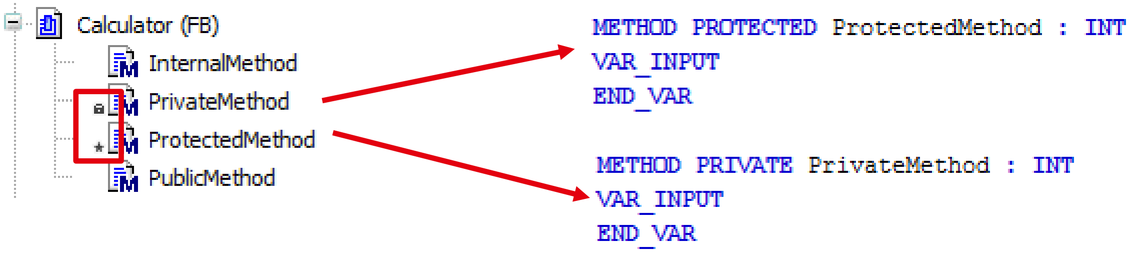
Motion + CNC

Fieldbus

Safety

Navigator

- Indicators (mini icons) for access specifier

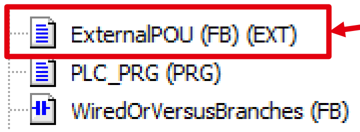


Calculator (FB)
- InternalMethod
- PrivateMethod
- ProtectedMethod
- PublicMethod

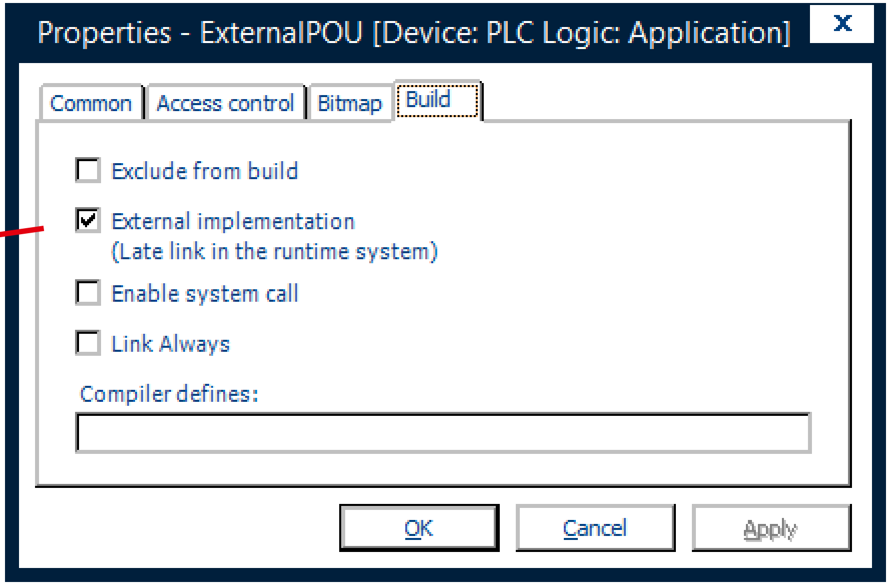
```
METHOD PROTECTED ProtectedMethod : INT
VAR_INPUT
END_VAR

METHOD PRIVATE PrivateMethod : INT
VAR_INPUT
END_VAR
```

- Indicator for external POUs



- ExternalPOU (FB) (EXT)
- PLC_PRG (PRG)
- WiredOrVersusBranches (FB)



Properties - ExternalPOU [Device: PLC Logic: Application]

□ Exclude from build

☑ External implementation
(Late link in the runtime system)

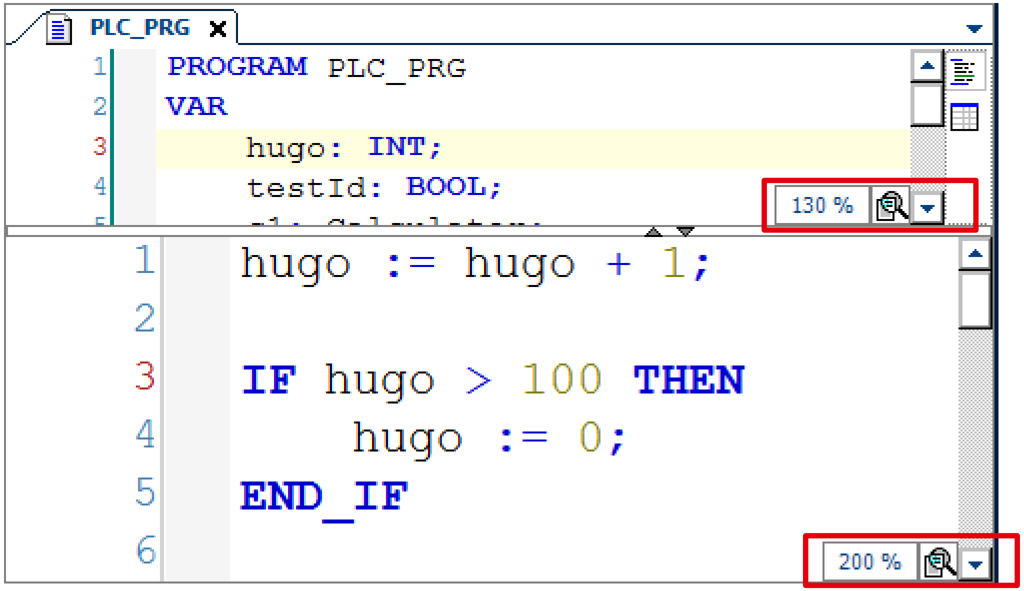
□ Enable system call

□ Link Always

Compiler defines:

ST editor

- Zoom
  - Zoom factor in the editor and with Ctrl key + mouse wheel
  - Settings transient; separate for each text field (incl. declaration part)
    Global setting possible as before in the options by means of font size



```
PROGRAM PLC_PRG
VAR
    hugo: INT;
    testId: BOOL;
    c1: Calculator;
```

130 %

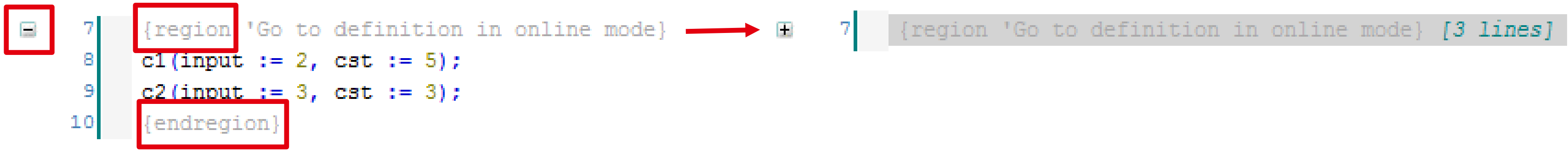
```
hugo := hugo + 1;

IF hugo > 100 THEN
    hugo := 0;
END_IF
```

200 %

ST editor

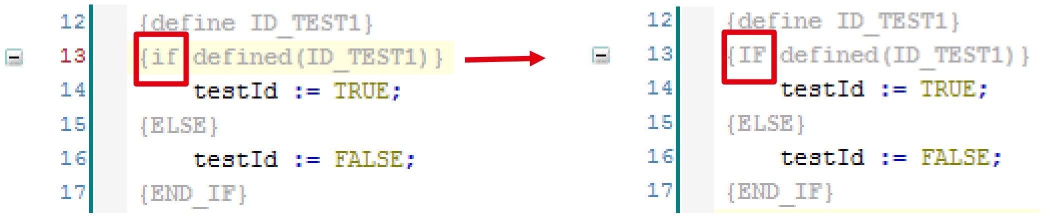
- Pragmas
  - New: Region for structuring code segments:
    Expand/collapse code segments identified with "region"



```
{region 'Go to definition in online mode}
c1(input := 2, cst := 5);
c2(input := 3, cst := 3);
{endregion}
```

```
{region 'Go to definition in online mode} [3 lines]
```

  - AutoFormat for pragmas:
    To prevent syntax errors
    Example: Only pragma operators in capital letters are executed.

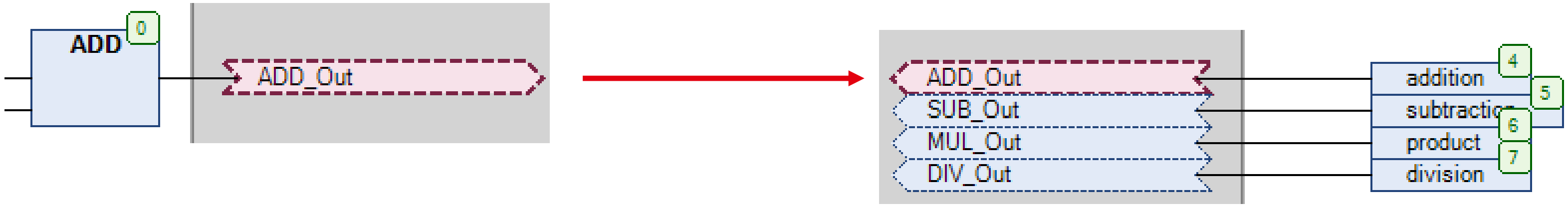


```
{define ID_TEST1}
{if defined(ID_TEST1)}
    testId := TRUE;
{ELSE}
    testId := FALSE;
{END_IF}
```

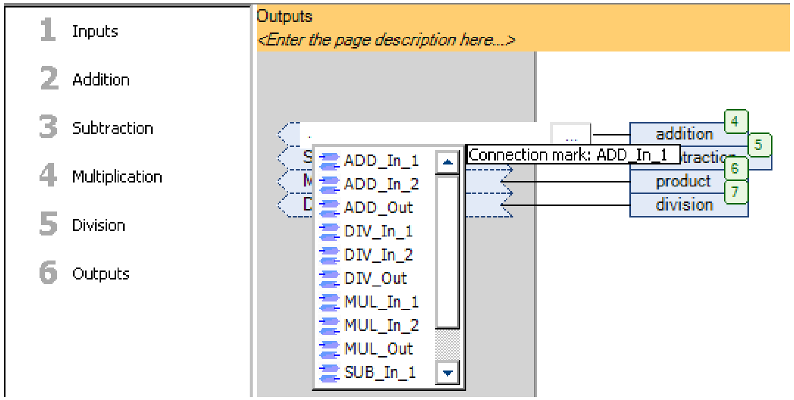
```
{define ID_TEST1}
{IF defined(ID_TEST1)}
    testId := TRUE;
{ELSE}
    testId := FALSE;
{END_IF}
```

CFC editor

- Improved connectors
  - Keyboard navigation



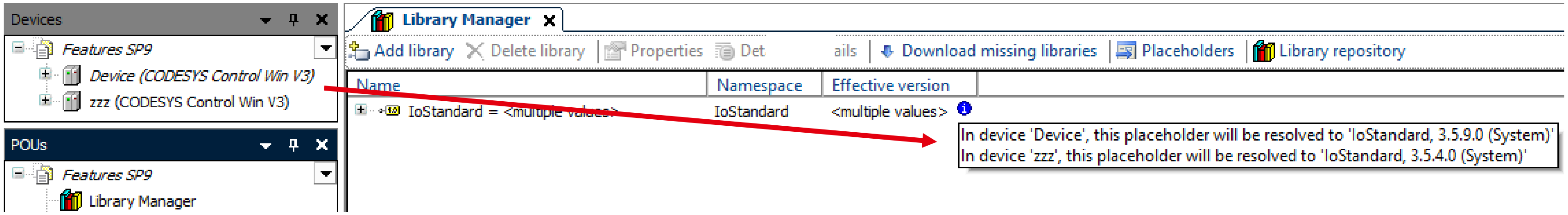
  - IntelliSense© for connectors



- Page-oriented CFC:
  - PLCopen XML support

Library manager

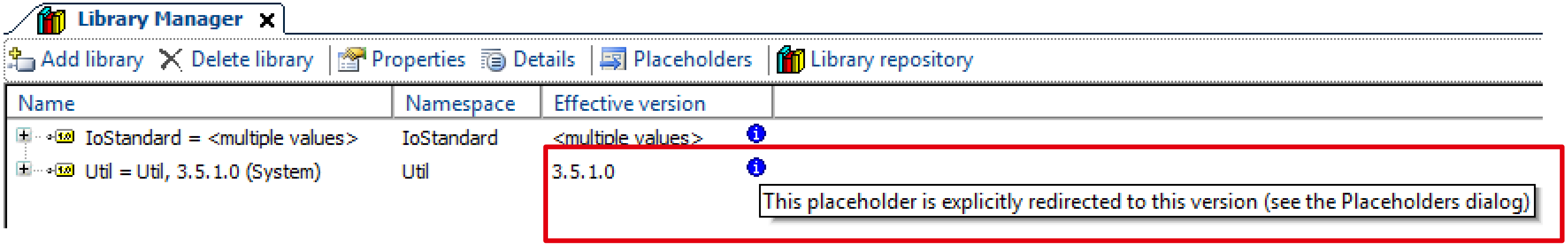
- Resolution of library placeholders dependent on device
  - Libraries in the POU tree can be used for different devices in the device tree.
    ➔ Different resolution of placeholders
  - Display of the resolution by indicator icon as tooltip



Name	Namespace	Effective version
IoStandard = <multiple values>	IoStandard	<multiple values>

In device 'Device', this placeholder will be resolved to 'IoStandard, 3.5.9.0 (System)'
In device 'zzz', this placeholder will be resolved to 'IoStandard, 3.5.4.0 (System)'

- Indicator icon for redirected placeholders



Name	Namespace	Effective version
IoStandard = <multiple values>	IoStandard	<multiple values>
Util = Util, 3.5.1.0 (System)	Util	3.5.1.0

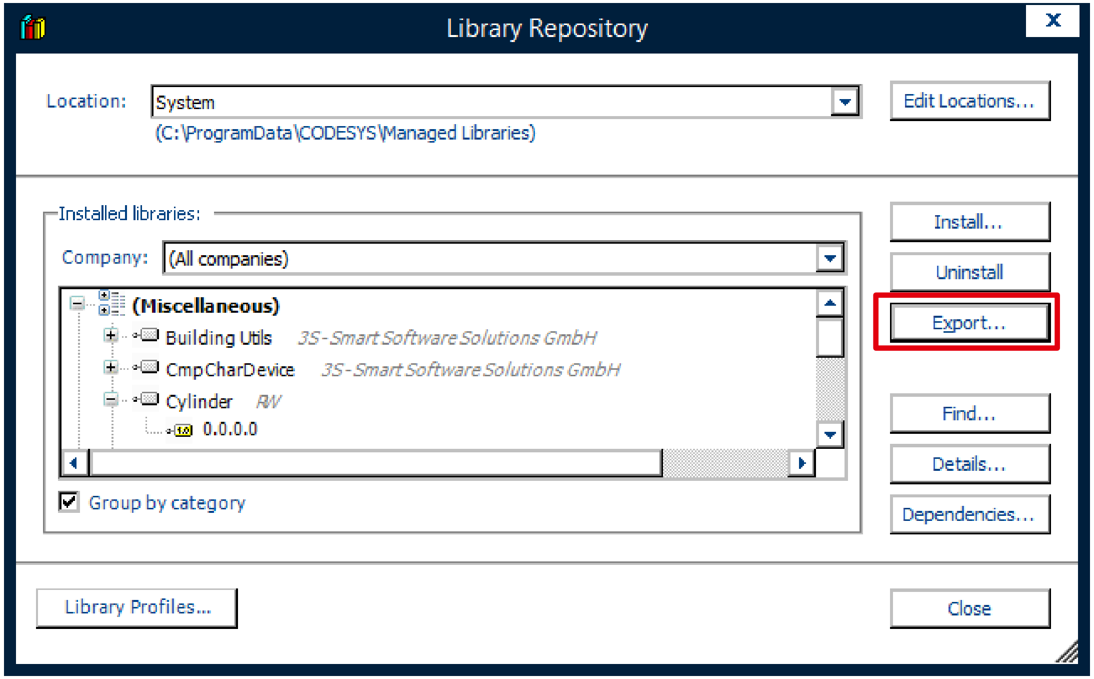
This placeholder is explicitly redirected to this version (see the Placeholders dialog)

Online

- "Go to definition" in online mode
  - Now jumps directly to the instance of the open FB
- Watch view
  - Flagging of the expanding status of structured variables

Library manager

- Automatic resetting of error messages due to missing libraries after post-installation in the library repository
- Export of libraries from the library repository
  Requirement: Installation of library in source code



Library Repository

Location: System
(C:\ProgramData\CODESYS\Managed Libraries)

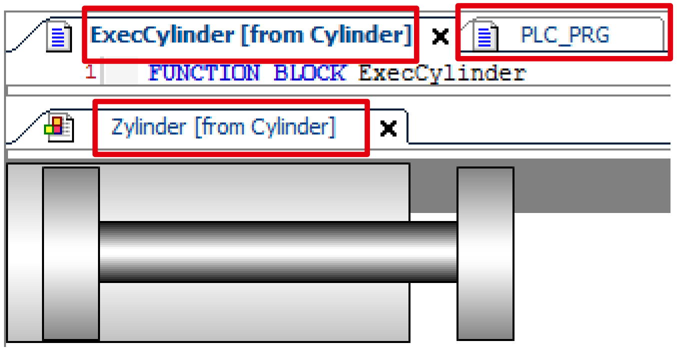
Installed libraries:
Company: (All companies)

- (Miscellaneous)
  - Building Utils 3S-Smart Software Solutions GmbH
  - CmpCharDevice 3S-Smart Software Solutions GmbH
  - Cylinder RV
    - 0.0.0.0

☑ Group by category

Frame

- Visual distinction between project and library POUs:
  ID for library POUs:
  <POU name>*[from <library name>]*



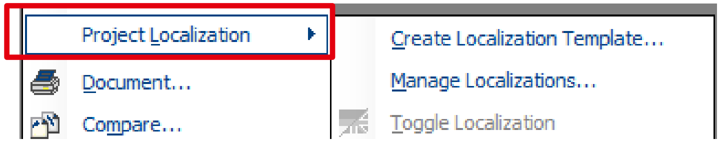
```
FUNCTION BLOCK ExecCylinder
```

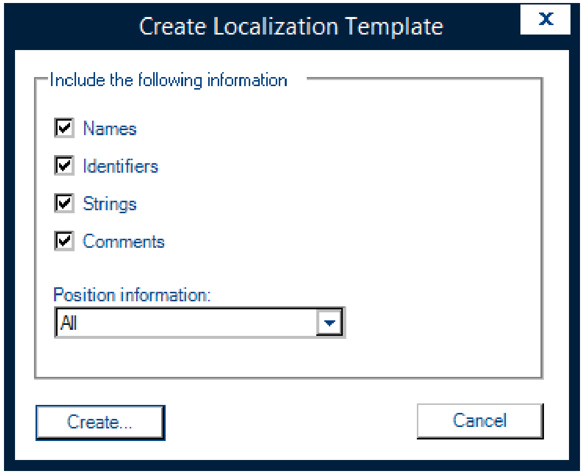
Project localization (displaying projects in other languages)

- Switch between source language and target language by means of selected localization file in the project
- Use case: Simplified commissioning/debugging of existing project
  - Only view in target language
  - No editing / save in target language

Project localization (displaying projects in other languages)

- Workflow for translating project contents into other languages:
  - Creation of a localization template *.pot format with the project data in the original language
  - Generation of localization files in *.po format using external tools (e. g. Poedit)
  - Translation of project information in the localization files
  - Import and management of the localization files in CODESYS




Create Localization Template

Include the following information

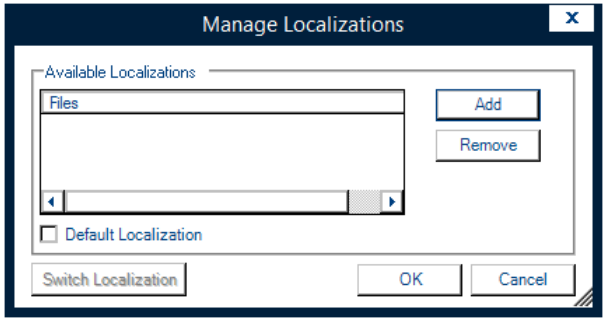
☑ Names

☑ Identifiers

☑ Strings

☑ Comments

Position information: All


Manage Localizations

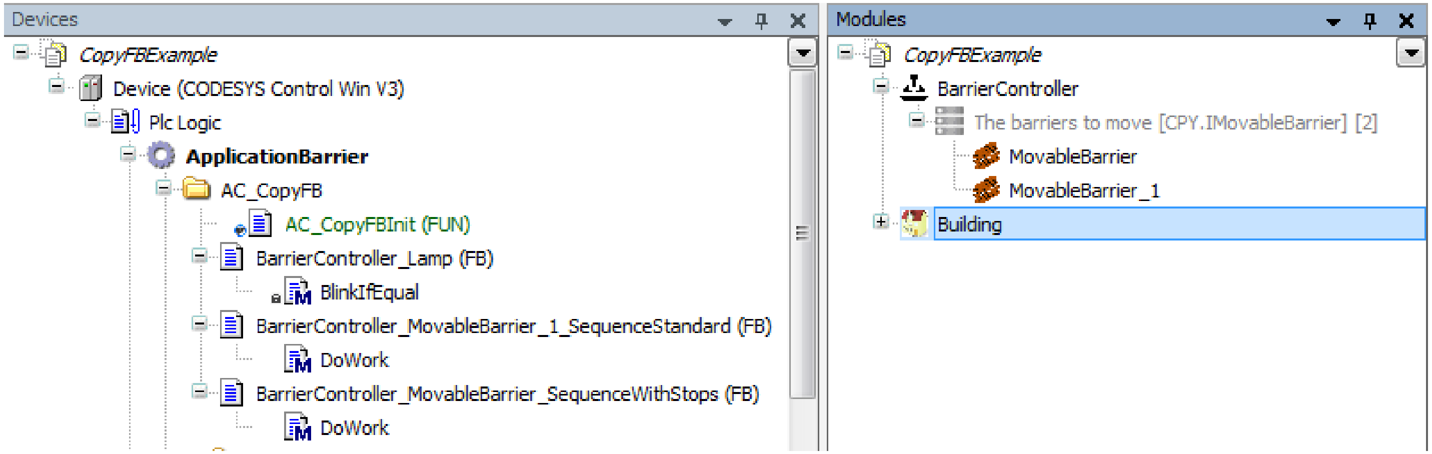
Available Localizations

Files

□ Default Localization

Application Composer

- New generator: source template
  - Creation of an FB based on a template POU
  - Specific template POU possible for each top-level module
  - Target: Modules commented out manually per instance
    ➔ Incorporation of own source code permanently in the generated project
    ➔ No overwriting by recent generator cycle



Devices

- *CopyFBExample*
  - Device (CODESYS Control Win V3)
    - Plc Logic
      - **ApplicationBarrier**
        - AC_CopyFB
          - AC_CopyFBInit (FUN)
          - BarrierController_Lamp (FB)
            - BlinkIfEqual
          - BarrierController_MovableBarrier_1_SequenceStandard (FB)
            - DoWork
          - BarrierController_MovableBarrier_SequenceWithStops (FB)
            - DoWork

Modules

- *CopyFBExample*
  - BarrierController
    - The barriers to move [CPY.IMovableBarrier] [2]
      - MovableBarrier
      - MovableBarrier_1
  - Building

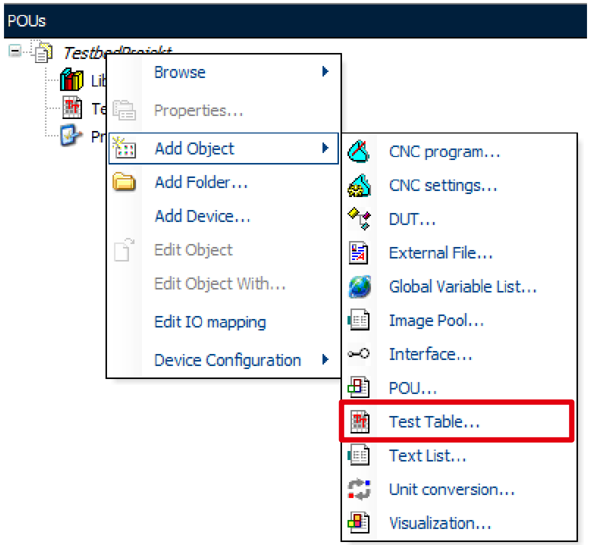
Application Composer

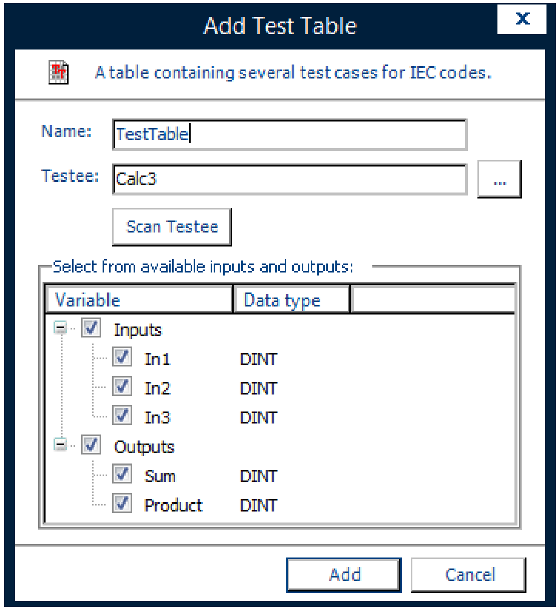
- Significant performance improvements
- Many detail improvements, including
  - Device parameters for device generator
  - New composer options
  - Links as part of module description / metadata
  - Option for generating multiple web/target visualization with visualization generator
  - Convenient functions for module declaration (automatic suggestion of text list entries)
  - Non-deletable default module instances
  - Improved online view for parameter and I/Os

Engineering

Test Manager

- Updated version available in the CODESYS Store
- Nee: Test tables
  - Tabular definition of test cases for unit tests
  - Separate object: Test table editor
  - Easy configuration of parameters
  - Automatic generation of visible test code for the test bed
    ➔ Detailed diagnosis in the test code (if necessary)





Add Test Table

A table containing several test cases for IEC codes.

Name: TestTable

Testee: Calc3

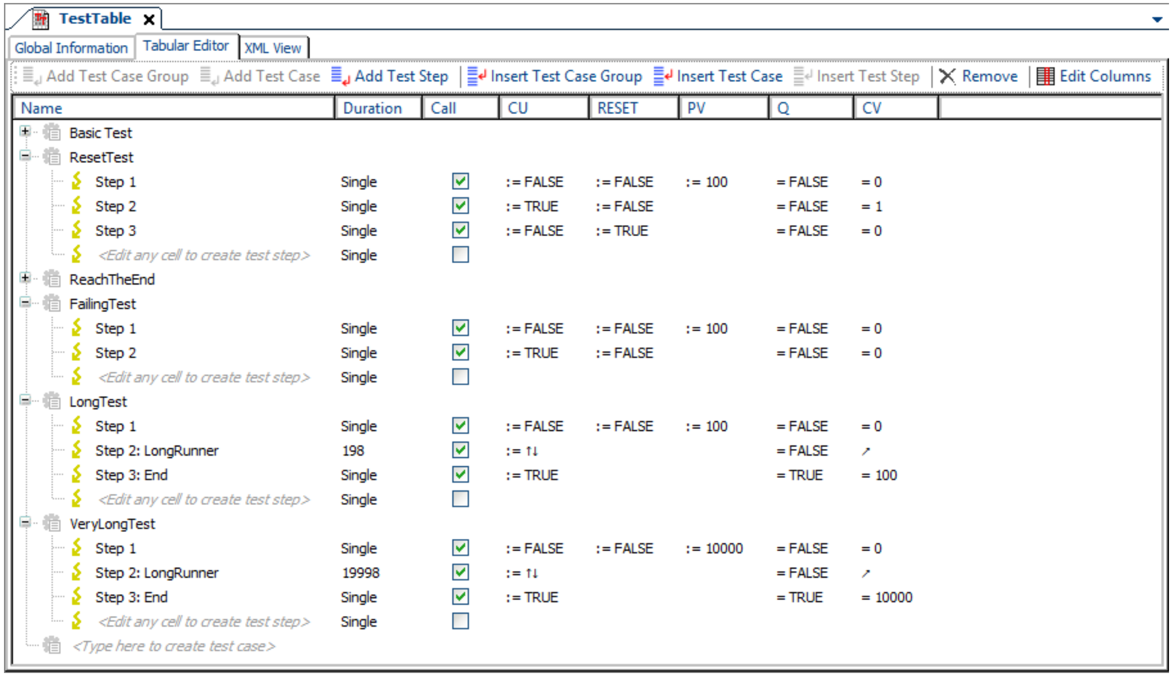
Scan Testee

Select from available inputs and outputs:

Variable	Data type
☑ Inputs	
☑ In1	DINT
☑ In2	DINT
☑ In3	DINT
☑ Outputs	
☑ Sum	DINT
☑ Product	DINT

Test Manager

- Additional functions:
  - Configuration of long-running test cases
  - Detailed conditions for time-dependent processing
  - Export/import of test specification in XML format



Name	Duration	Call	CU	RESET	PV	Q	CV
Basic Test							
ResetTest							
Step 1	Single	☑	:= FALSE	:= FALSE	:= 100	= FALSE	= 0
Step 2	Single	☑	:= TRUE	:= FALSE		= FALSE	= 1
Step 3	Single	☑	:= FALSE	:= TRUE		= FALSE	= 0
<Edit any cell to create test step>	Single	□					
ReachTheEnd							
FailingTest							
Step 1	Single	☑	:= FALSE	:= FALSE	:= 100	= FALSE	= 0
Step 2	Single	☑	:= TRUE	:= FALSE		= FALSE	= 0
<Edit any cell to create test step>	Single	□					
LongTest							
Step 1	Single	☑	:= FALSE	:= FALSE	:= 100	= FALSE	= 0
Step 2: LongRunner	198	☑	:= ↑↓			= FALSE	↗
Step 3: End	Single	☑	:= TRUE			= TRUE	= 100
<Edit any cell to create test step>	Single	□					
VeryLongTest							
Step 1	Single	☑	:= FALSE	:= FALSE	:= 10000	= FALSE	= 0
Step 2: LongRunner	19998	☑	:= ↑↓			= FALSE	↗
Step 3: End	Single	☑	:= TRUE			= TRUE	= 10000
<Edit any cell to create test step>	Single	□					
<Type here to create test case>							

Agenda

1 Runtime

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3 **Visualization**

4 Motion + CNC

5 Fieldbus

6 Other

Visualization

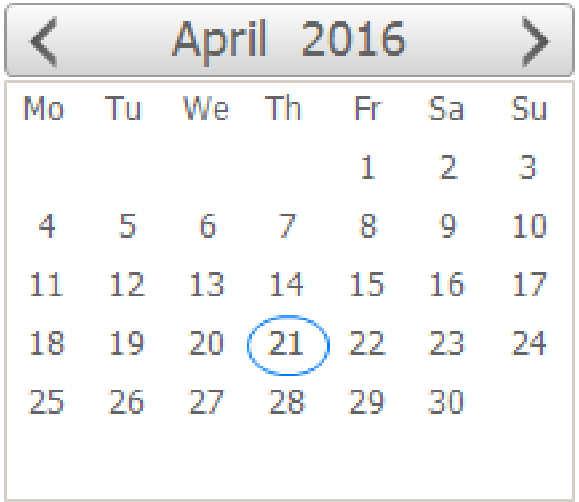
Overview

- New visualization element "Date picker"
- New visualization element "Date and time picker"
- Enumerations with text lists
- Keypad text field – Input with selection
- Event for value changes in the visualization
- Miscellaneous
- Depictor

Runtime
Engineering
Visualization
Motion + CNC
Fieldbus
Safety

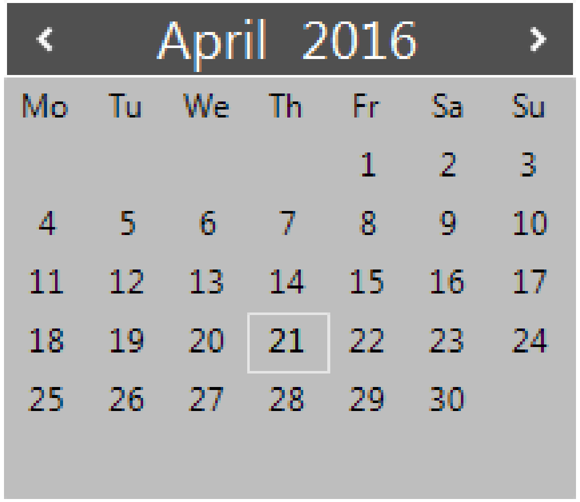
New visualization element "Date picker"

- For selecting a date and saving to a DATE variable
- Processing by applications
- Manual configuration and by visualization profile



< April 2016 >

Mo	Tu	We	Th	Fr	Sa	Su
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

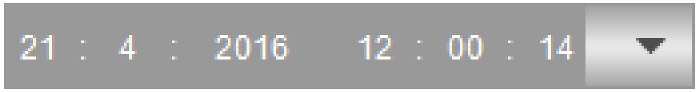


< April 2016 >

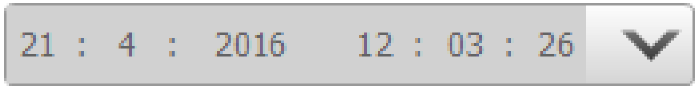
Mo	Tu	We	Th	Fr	Sa	Su
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

New visualization element "Date and time picker"

- For selecting a date and time and saving to a DATE_AND_TIME variable
- Selection and processing of individual cells
- Date selection similar to combo box



21 : 4 : 2016 12 : 00 : 14



21 : 4 : 2016 12 : 03 : 26

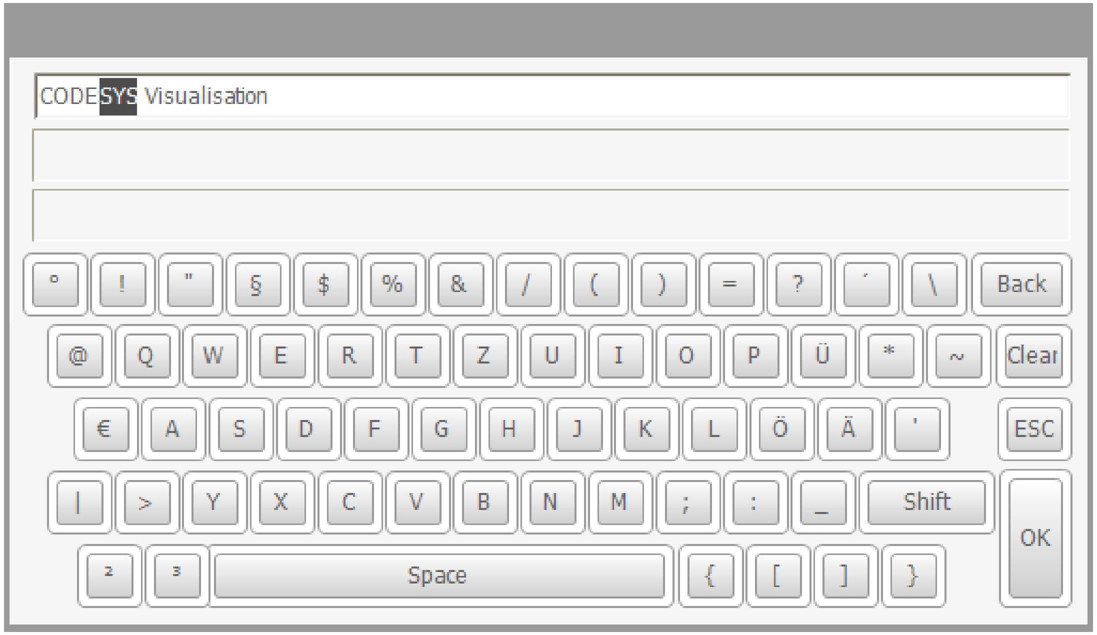
Visualization

Enumerations with text lists

- Previously:
  Visualization to an enumeration requires parallel maintenance of a text list for text list output of an enumeration variable,
- New:
  - Activation of "Text list support" when creating an enumeration
  - Multilingual enumeration texts
  - Easy configuration in text output elements as well as within the combo box
  - Easy conversion of existing projects with command

Keypad text field – Input with selection

- IEC variables configurable for selection information
- Significant improvement of numpad/keypad operation



CODESYS Visualisation

° ! " § $ % & / ( ) = ? ´ \ Back
@ Q W E R T Z U I O P Ü * ~ Clear
€ A S D F G H J K L Ö Ä ' ESC
| > Y X C V B N M ; : _ Shift
² ³ Space { [ ] }
OK

Visualization

Event for value changes in the visualization

- Registration of applications by means of an instance of IValueChangedListener in the visualization:

```
FUNCTION_BLOCK FB_ValueChangedListener IMPLEMENTS
VisuElems.IValueChangedListener
```

- The ValueChanged method is called when a variable value is changed in the visualization.
- Typical application: Logging user input from the visualization
- CODESYS Store sample: Logging value changes with the visualization in the standard logger of the CODESYS Development System

Visualization

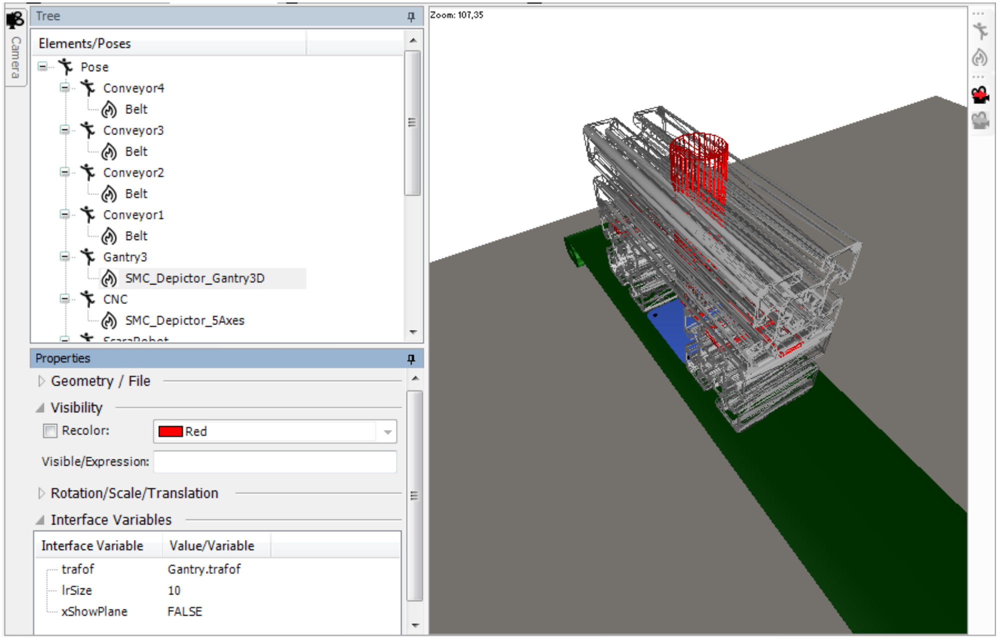
Other

- Use of symbol commands with `REAL` coordinates
  ➔ Precise rotation of polygons and rectangles
- CODESYS command for copying the alarm history to a separate file
- Remote TargetVisu with network scan interface
- Improved operability of visualization elements on devices with multi-touch capability
  - Scrolling a scrollable frame or tab controls by means of swiping gestures
- Easy multi-touch implementation for WinCE

Visualization

Depictor

- Revision of the user interface
  - Unrestricted definable window (sandbox) and toolbar
- Numerous detail improvements:
  - New transformation type (eye target)
  - 3D navigation (additional zoom option)
  - Expression evaluation
  - Movement of camera positions from the application per index



Elements/Poses

- Pose
  - Conveyor4
    - Belt
  - Conveyor3
    - Belt
  - Conveyor2
    - Belt
  - Conveyor1
    - Belt
  - Gantry3
    - SMC_Depictor_Gantry3D
  - CNC
    - SMC_Depictor_5Axes
  - ScaraRobot

Geometry / File

Visibility

□ Recolor: 🟥 Red

Visible/Expression:

Rotation/Scale/Translation

Interface Variables

Interface Variable	Value/Variable
trafof	Gantry.trafof
lrSize	10
xShowPlane	FALSE

Agenda

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Motion + CNC

Overview

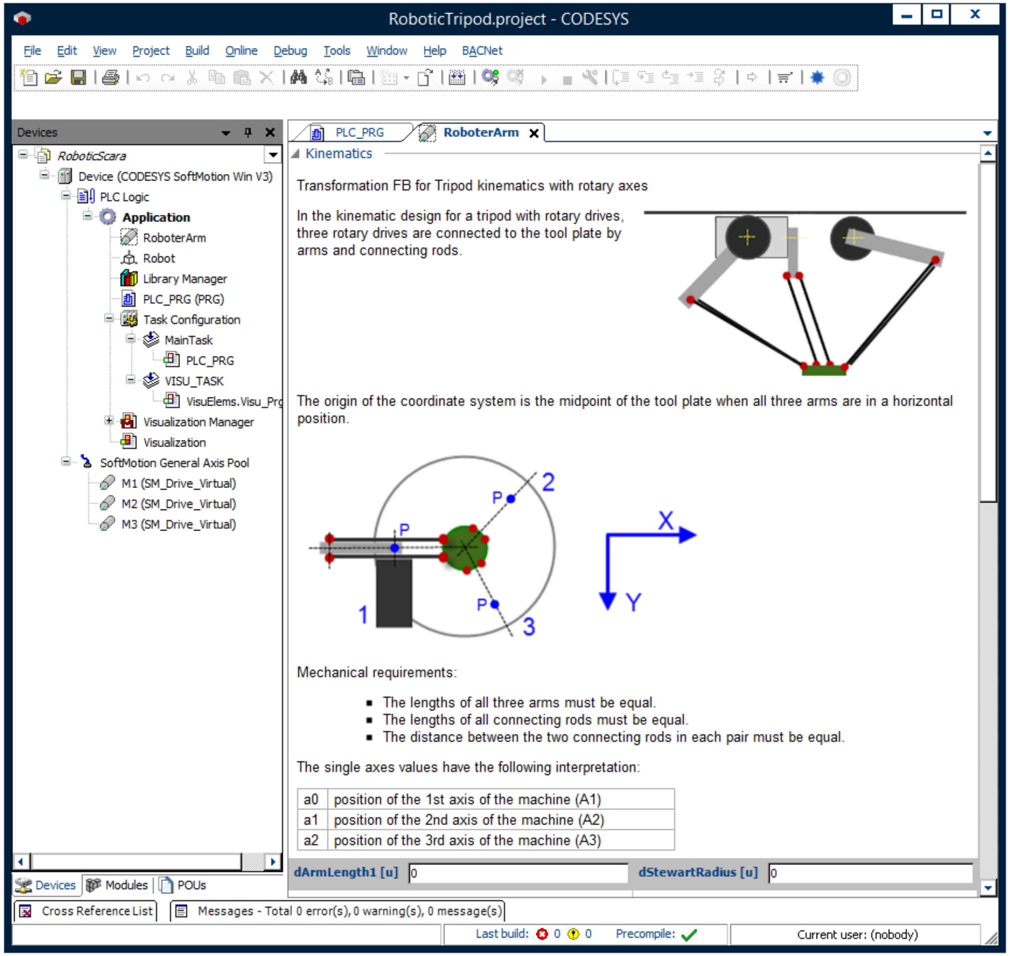
- Robotics

Robotics - General

- Robotics functionality integrated in CODESYS SoftMotion CNC
- Product renamed to CODESYS SoftMotion CNC+Robotics
- Available for
  - Device manufacturers: Device licensing with 3s.dat
  - End users: Licensing per single device ("SL" extension)
- Provided as separate package with update mechanism
- Package included as a demo in the setup of the CODESYS Development System; additional post-installation possible from the CODESYS Store

Robotics – New functionality

- Easy parameterization of axis groups for pre-defined kinematics in a dedicated editor
- Integrated motion planning with coordinate values for robot positions in different coordinate systems
- Support of numerous kinematics providing easy configuration, such as different portal robots (2/3/5 axes), bipod/tripod robots, SCARA robots



Transformation FB for Tripod kinematics with rotary axes

In the kinematic design for a tripod with rotary drives, three rotary drives are connected to the tool plate by arms and connecting rods.

The origin of the coordinate system is the midpoint of the tool plate when all three arms are in a horizontal position.

Mechanical requirements:

- The lengths of all three arms must be equal.
- The lengths of all connecting rods must be equal.
- The distance between the two connecting rods in each pair must be equal.

The single axes values have the following interpretation:

a0	position of the 1st axis of the machine (A1)
a1	position of the 2nd axis of the machine (A2)
a2	position of the 3rd axis of the machine (A3)

dArmLength1 [u] 0

dStewartRadius [u] 0

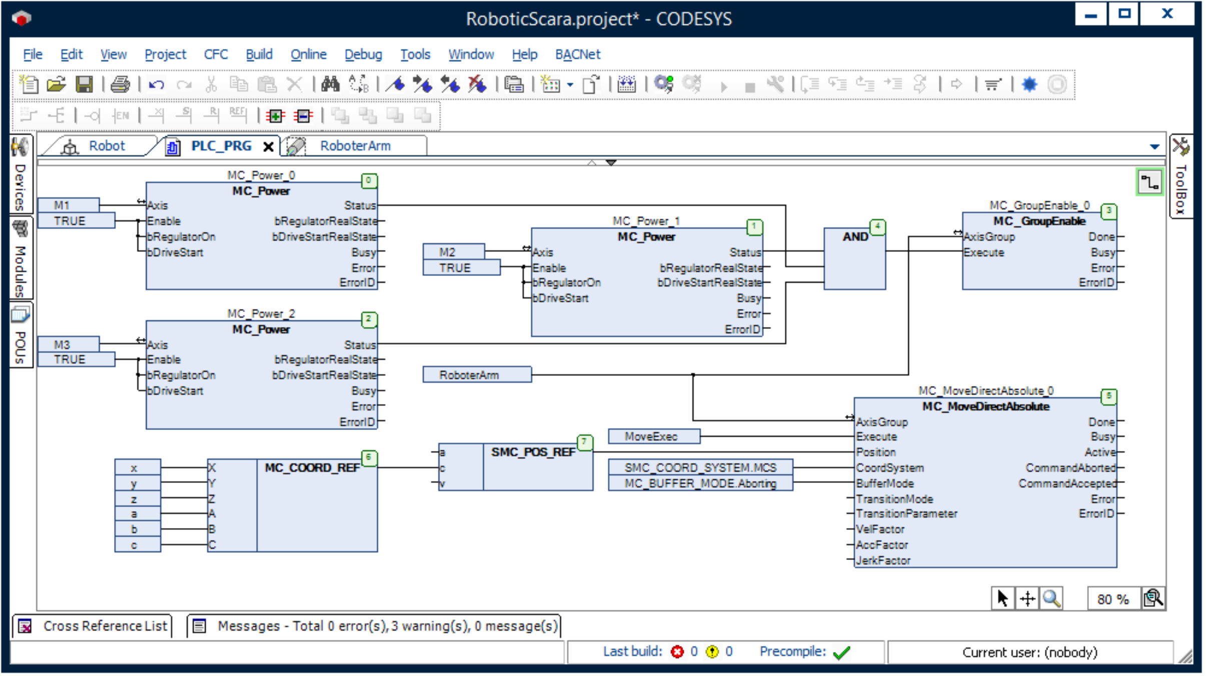
Messages - Total 0 error(s), 0 warning(s), 0 message(s)

Last build: 0 0 Precompile: ✓

Current user: (nobody)

Robotics – New functionality

- Additional tool kinematics
- Function library with POUs according to PLCopen Motion Part 4, such as MC_GroupEnable/Disable/Reset/ReadError, MC_MoveDirectAbsolute, MC_MoveDirectRelative, MC_GroupHalt, MC_GroupStop➔ Easier programming



Messages - Total 0 error(s), 3 warning(s), 0 message(s)

Last build: ⊗ 0 ⓘ 0 Precompile: ✓

Current user: (nobody)

Agenda

1 Runtime

2 Engineering

3 Visualization

4 Motion + CNC

5 Fieldbus

6 Miscellaneous

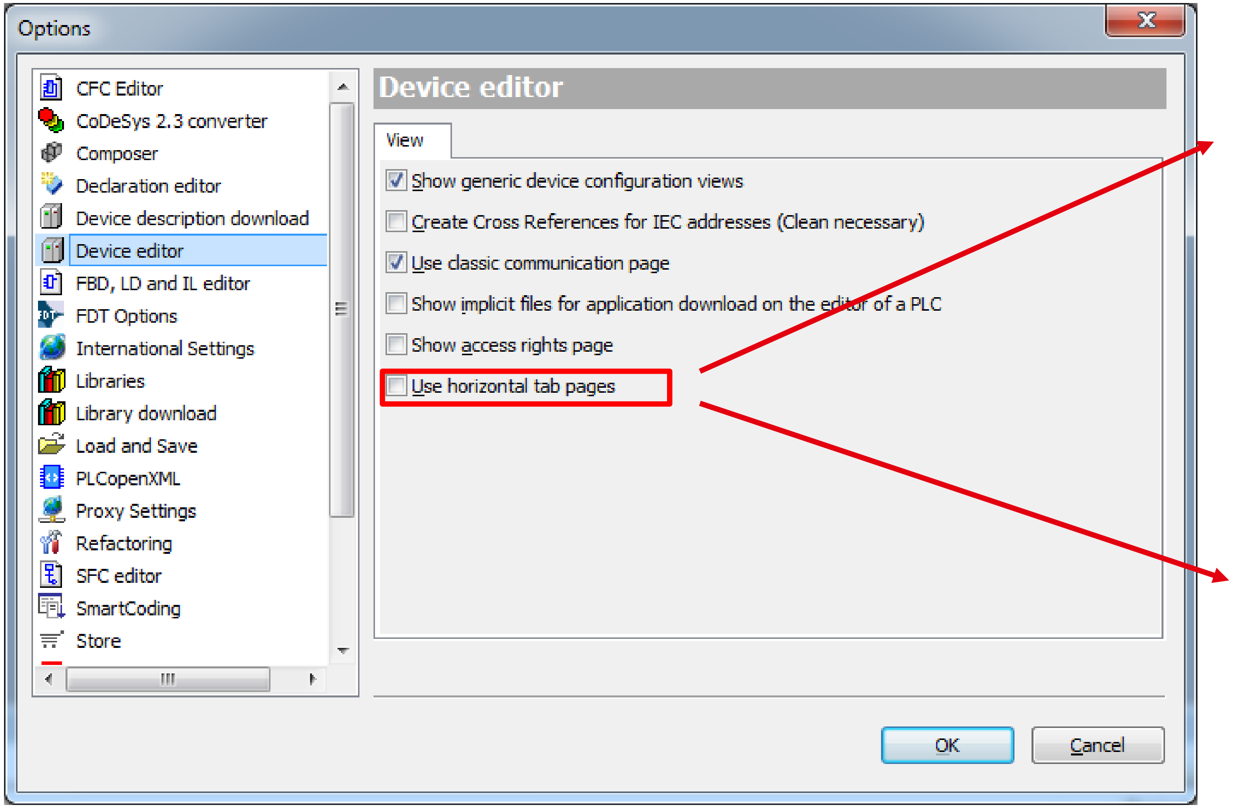
Fieldbus

Overview

- General extensions
- CANopen
- J1939
- EtherCAT
- PROFINET
- IoDriver
- PFC200

General extensions

- DeviceEditor
  - Configurable location of menu display



Options

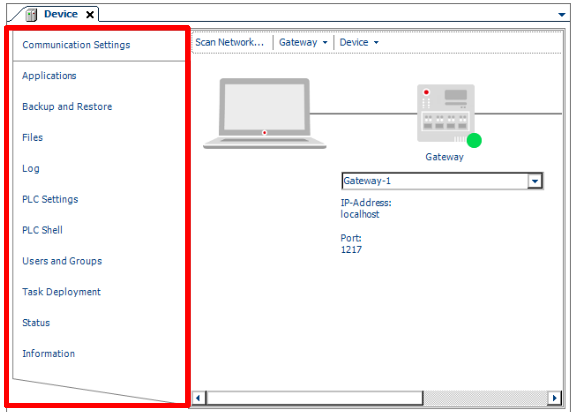
- CFC Editor
- CoDeSys 2.3 converter
- Composer
- Declaration editor
- Device description download
- Device editor
- FBD, LD and IL editor
- FDT Options
- International Settings
- Libraries
- Library download
- Load and Save
- PLCopenXML
- Proxy Settings
- Refactoring
- SFC editor
- SmartCoding
- Store

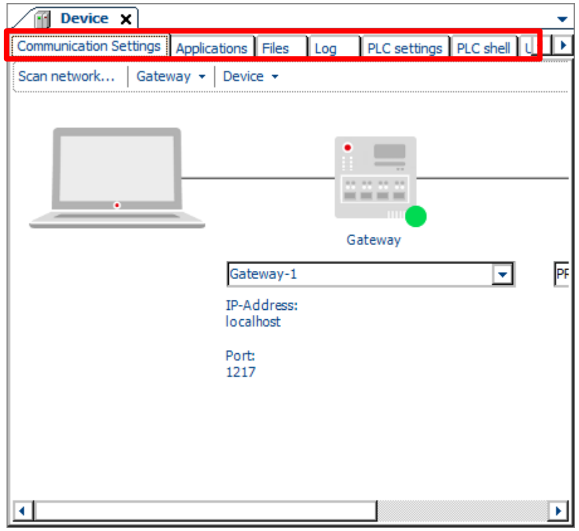
Device editor

View

- ☑ Show generic device configuration views
- □ Create Cross References for IEC addresses (Clean necessary)
- ☑ Use classic communication page
- □ Show implicit files for application download on the editor of a PLC
- □ Show access rights page
- □ Use horizontal tab pages

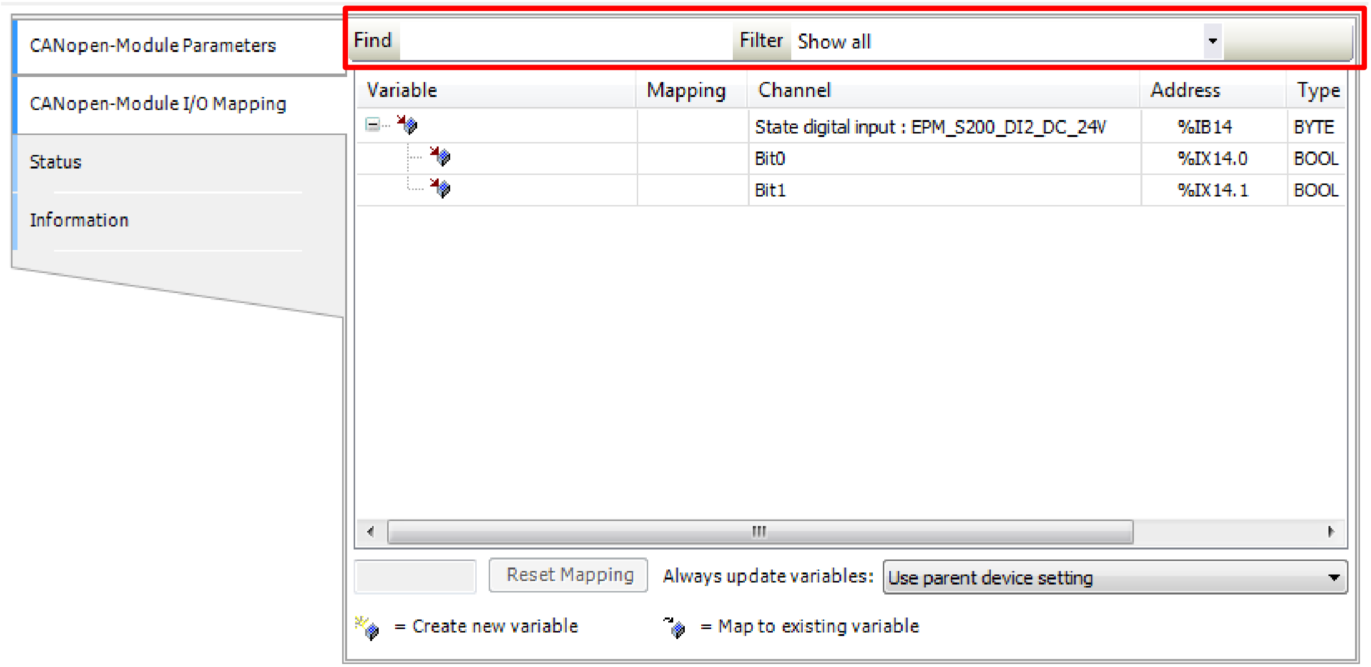
OK Cancel





General extensions

- DeviceEditor
  - The I/O mapping page provides filtering by mapping.



Filter: Show all

Variable	Mapping	Channel	Address	Type
		State digital input : EPM_S200_DI2_DC_24V	%IB14	BYTE
		Bit0	%IX14.0	BOOL
		Bit1	%IX14.1	BOOL

Always update variables: Use parent device setting

= Create new variable

= Map to existing variable

Fieldbus

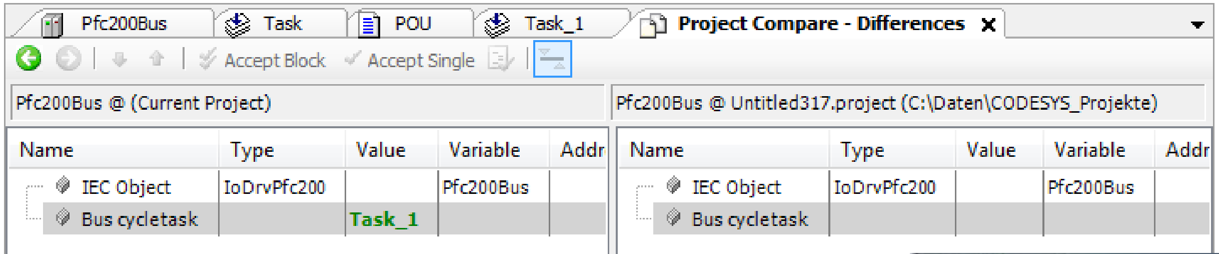
General extensions

- DeviceRepository
  - Drag devices from the device repository to the device tree
  - Long path functions for devices now supported
- Project localization for device configuration editors

Fieldbus

General extensions

- DeviceObject
  - Redundant type declarations for different instances of the same device type ➔ For improved performance
  - Auto-conversion of BOOL to BIT now suppressed
  - Project compare shows changes in bus task cycle settings



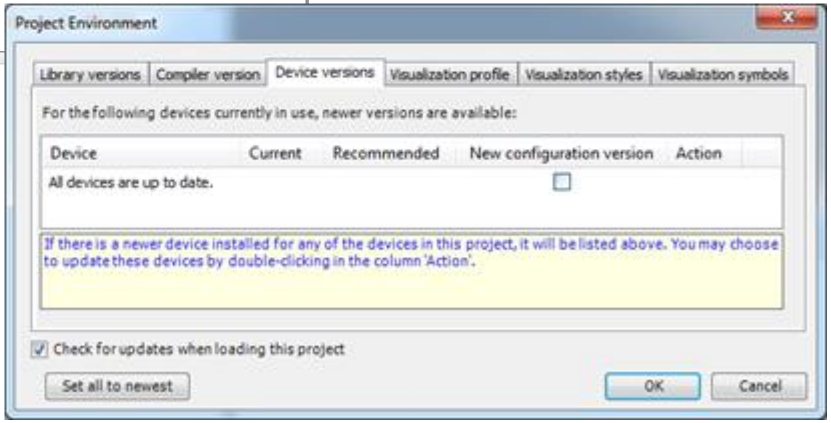
Pfc200Bus @ (Current Project)

Name	Type	Value	Variable	Addr
IEC Object	IoDrvPfc200		Pfc200Bus	
Bus cycletask		Task_1		

Pfc200Bus @ Untitled317.project (C:\Daten\CODESYS_Projekte)

Name	Type	Value	Variable	Addr
IEC Object	IoDrvPfc200		Pfc200Bus	
Bus cycletask				

  - Extension of devices by config version and Environment" dialog



For the following devices currently in use, newer versions are available:

Device	Current	Recommended	New configuration version	Action
All devices are up to date.			□	

If there is a newer device installed for any of the devices in this project, it will be listed above. You may choose to update these devices by double-clicking in the column 'Action'.

☑ Check for updates when loading this project

Fieldbus

CAN

- CANMinidriver
  - Conformance test
- CANopen scan
  - Selection for device descriptions shown in case more than one matching description was found
- J1939
  - Implementation of CAA device diagnosis

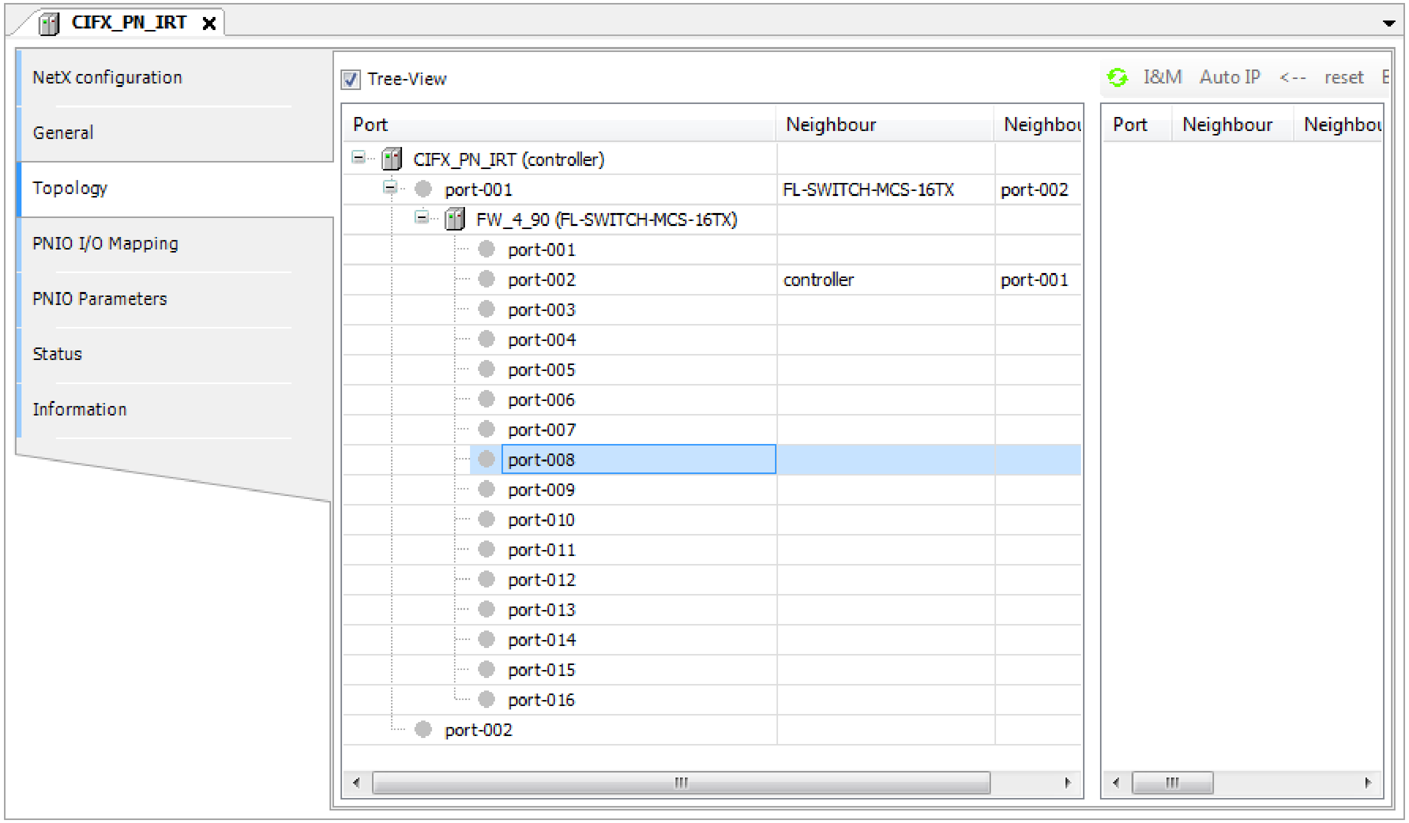
Fieldbus

EtherCAT

- DIP/DIL switches as second option for setting the optional device address
- EtherCAT master
  - Show differences to the PLC logger for better diagnostic in case of missing slaves on the network
- DeviceEditorEthercat
  - Support of EP6224 IO link gateway

PROFINET

- PROFINET Configurator
  - Editor for configuring controller ports and topology

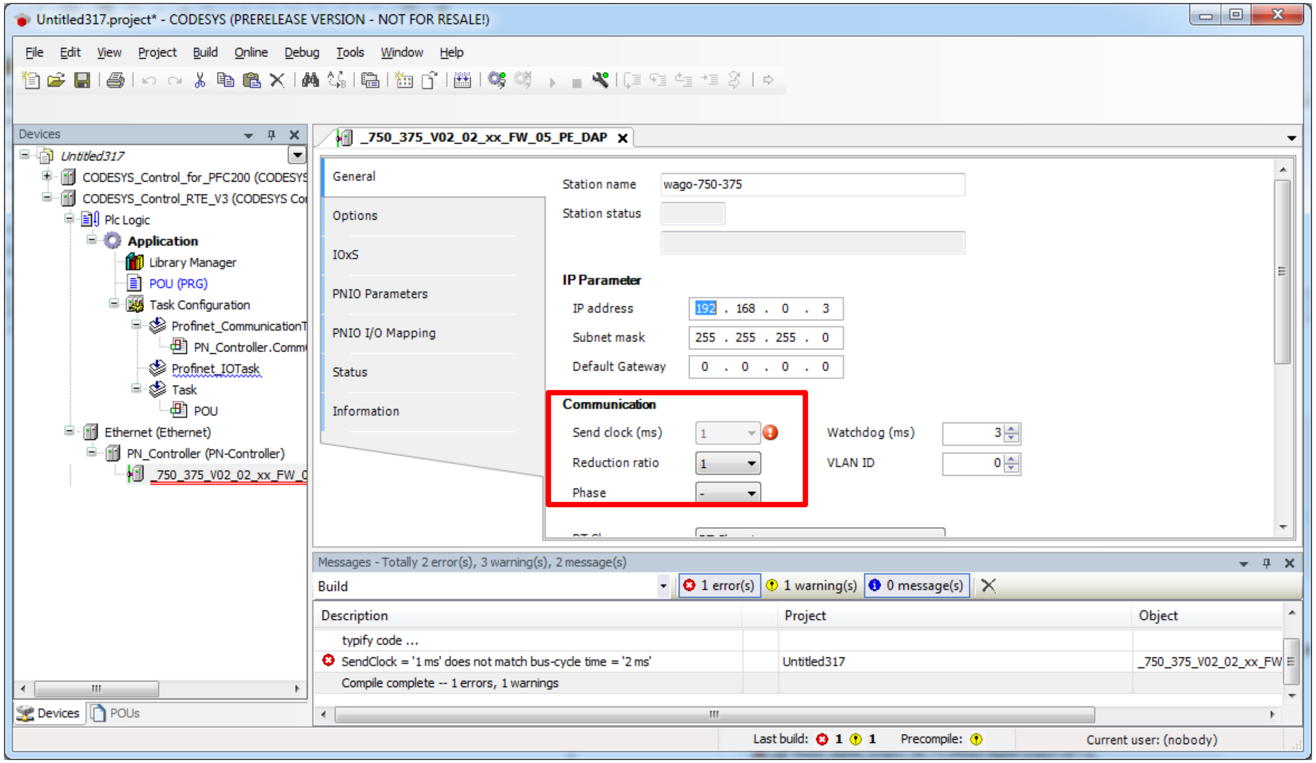


Port	Neighbour	Neighbou
CIFX_PN_IRT (controller)		
port-001	FL-SWITCH-MCS-16TX	port-002
FW_4_90 (FL-SWITCH-MCS-16TX)		
port-001		
port-002	controller	port-001
port-003		
port-004		
port-005		
port-006		
port-007		
port-008		
port-009		
port-010		
port-011		
port-012		
port-013		
port-014		
port-015		
port-016		
port-002		

Port	Neighbour	Neighbou

PROFINET

- PROFINET Configurator
  - Advanced check for SendClock - by determining lowest reduction ratio, phases, and bus cycle time



Station name: wago-750-375

Station status:

IP Parameter

IP address: 192 . 168 . 0 . 3

Subnet mask: 255 . 255 . 255 . 0

Default Gateway: 0 . 0 . 0 . 0

Communication

Send clock (ms): 1

Reduction ratio: 1

Phase: -

Watchdog (ms): 3

VLAN ID: 0

Messages - Totally 2 error(s), 3 warning(s), 2 message(s)

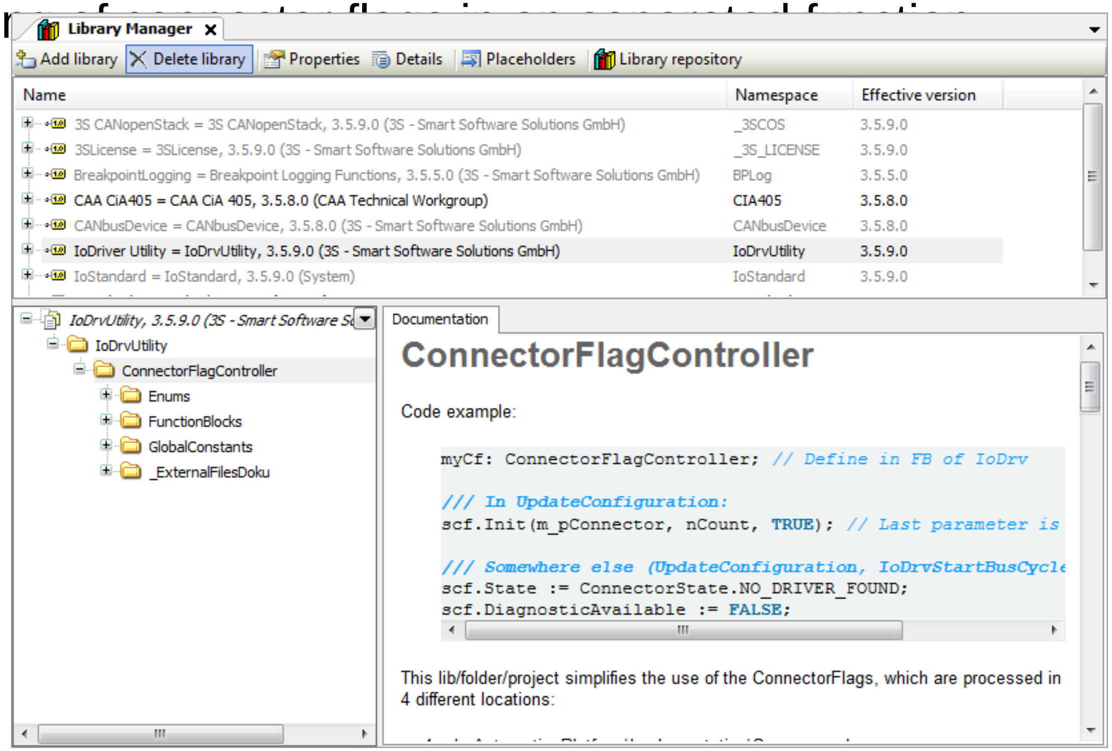
Build | 1 error(s) | 1 warning(s) | 0 message(s)

Description	Project	Object
typify code ...		
SendClock = '1 ms' does not match bus-cycle time = '2 ms'	Untitled317	_750_375_V02_02_xx_FW
Compile complete -- 1 errors, 1 warnings		

Last build: 1 1 Precompile: Current user: (nobody)

IoDriver

- IoDrvTemplate
  - Extension as master driver with slaves and modules
- IoDrvBase
  - Encapsulation of the handling of connector flags in an separated function block



Name	Namespace	Effective version
3S CANopenStack = 3S CANopenStack, 3.5.9.0 (3S - Smart Software Solutions GmbH)	_3SCOS	3.5.9.0
3SLicense = 3SLicense, 3.5.9.0 (3S - Smart Software Solutions GmbH)	_3S_LICENSE	3.5.9.0
BreakpointLogging = Breakpoint Logging Functions, 3.5.5.0 (3S - Smart Software Solutions GmbH)	BPLog	3.5.5.0
CAA CiA405 = CAA CiA 405, 3.5.8.0 (CAA Technical Workgroup)	CIA405	3.5.8.0
CANbusDevice = CANbusDevice, 3.5.8.0 (3S - Smart Software Solutions GmbH)	CANbusDevice	3.5.8.0
IoDriver Utility = IoDrvUtility, 3.5.9.0 (3S - Smart Software Solutions GmbH)	IoDrvUtility	3.5.9.0
IoStandard = IoStandard, 3.5.9.0 (System)	IoStandard	3.5.9.0

- *IoDrvUtility, 3.5.9.0 (3S - Smart Software S*
  - IoDrvUtility
    - ConnectorFlagController
      - Enums
      - FunctionBlocks
      - GlobalConstants
      - _ExternalFilesDoku

ConnectorFlagController

Code example:

```
myCf: ConnectorFlagController; // Define in FB of IoDrv

/// In UpdateConfiguration:
scf.Init(m_pConnector, nCount, TRUE); // Last parameter is

/// Somewhere else (UpdateConfiguration, IoDrvStartBusCycle
scf.State := ConnectorState.NO_DRIVER_FOUND;
scf.DiagnosticAvailable := FALSE;
```

This lib/folder/project simplifies the use of the ConnectorFlags, which are processed in 4 different locations:

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Miscellaneous

Discontinuations

- As of SP9, the following products are no longer supported for systems with a Windows version earlier than Windows 7:
  - CODESYS Control RTE
  - CODESYS Control RTE (for Beckhoff CX)
  - CODESYS Control SoftMotion RTE
  - CODESYS Control SoftMotion RTE (for Beckhoff)
  - CODESYS Control Win
  - CODESYS Automation Platform SDK
  - CODESYS OPC Server
  - CODESYS HMI
  - CODESYS Gateway

CODESYS

Inspiring Automation Solutions

Thank you for your attention.