

Features & Improvements CODESYS V3.5 SP11

1 Runtime

2 Runtime Embedded

3 Engineering

4 Application

5 Visualization

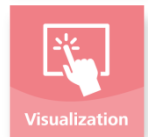
6 Motion+CNC

7 Fieldbus

8 Discontinuations


Overview

- CODESYS 64bit
- Security
 - X.509 Certificate Management
 - OPC UA Server
- MultiCore Support [**Beta**]
- CODESYS Control Win
- General Improvements



CODESYS 64bit

Part of CODESYS Development System 64bit setup:

- CODESYS Control Win 64bit 
 - Parallel installation to 32bit runtime possible
 - Running as single runtime process
- CODESYS Gateway 64bit (server and client)
- CODESYS Simulation 64bit



Security

- X.509 Certificate Management
 - Functional release with V3.5 SP10
 - New: online interface for communication between runtime and development system
- OPC UA Server
 - Encryption of OPC UA communication based on X.509 certificates
 - OPC standard compliant (OPC test tool not yet available)



MultiCore Support [Beta]

- Support of multi-core processors for CODESYS Runtime
- Beta release available on selected standard platforms
 - Activation via target setting
 - Delivery available on demand
- Main release planned for V3.5 SP12



CODESYS Control Win

- Separation of installation and working directory
- Before:
 - Installation directory writable for all users
- Now:
 - Change of installation data only by administrators
- Installation directory
C:\Program Files (x86)\3S CODESYS v3.5.11.0\GatewayPLC\
- Working directory
C:\ProgramData\CODESYS\CODESYSControlWinV3\xxxxxxxx\



General Improvements

- Memory management
 - Infrastructure for definite handles at runtime
 - Generic hash table for runtime system
 - Performance improvements for garbage collector
 - Significant for „heap“ components like OPC UA stack
- PLC shell commands
 - Commands for read/write of real-time clock
- Runtime documentation
 - Code generator target settings: sorting by plug-ins

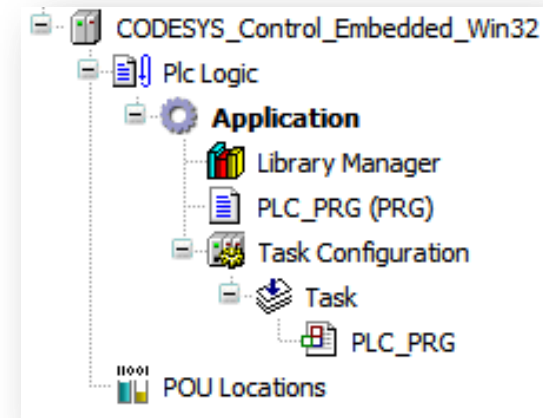
Overview

- POU Location Editor
- „SL“ Control Products
 - ***New*** CODESYS Control for IOT2000 SL
 - ***New*** CODESYS Control for PFC100 SL
 - CODESYS Control for Raspberry Pi SL
- Runtime Update Tool



POU Location Editor

- Support of multiple code areas (flash areas)
 - New application object „POU Locations“
- Display of current language model location
- Shift of POU's/libraries to new code areas

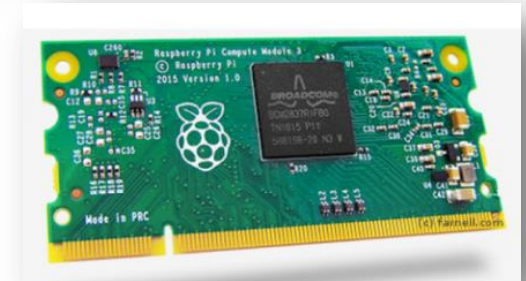


Items	Type	Current location	Configured location	Code size
Application		area_0, area_1	default	191039
IoConfigAfterTask_1	Function	area_0	default	224
IoConfigBeforeTask_0	Function	area_0	default	104
PLC_PRG	Program	area_0	default	34072
PLC_PRG_1	Program	area_1	area_1	136216
SystemPOUs	SystemPOU	area_0	default	2463
3slicense, 3.5.10.0 (3s - smart software solutions gmbh)	Library	area_0	default	9728
cmplog, 3.5.5.0 (system)	Library		default	
component manager, 3.5.9.0 (system)	Library		area_0	
iostandard, 3.5.10.0 (system)	Library	area_0	area_1	3192
standard, 3.5.5.0 (system)	Library	area_0	default	1296

„SL“ Control Products

- New control products
 - CODESYS Control for IOT2000 SL
 - CODESYS Control for PFC100 SL

- CODESYS Control for Raspberry Pi SL
 - Support of Compute Model



Sales via [CODESYS Store](#)

Runtime Update Tool

- General update tool for all Linux SL controls
 - New views and commands
 - Scan dialogue
 - System information view

```

System information: pi@192.168.96.39

└─┬─ CPU Info
   │ processor      : 0
   │ model name     : ARMv7 Processor rev 4 (v7l)
   │ Bogomips       : 76.80
   │ Features       : half thumb fastmult vfp edsp neon vfpv3 tls vfpv4 idiva idivt vfpd32 lpae evtstrm crc32
   │ CPU implementer : 0x41
   │ CPU architecture: 7
   │ CPU variant    : 0x0
   │ CPU part       : 0x003
   │ CPU revision   : 4
   └─┬─ Network Info
      │ root
      │ eth0  Link encap:Ethernet  HWaddr b8:27:eb:b2:26:ca
      │       inet addr:192.168.96.39  Bcast:192.168.183.255  Mask:255.255.248.0
      │       inet6 addr: fe80::04cc:65f9:7db5:15a9/64 Scope:Link
      │       UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
      │       RX packets:64125000 errors:0 dropped:3929072 overruns:0 frame:0
      │       TX packets:864594 errors:0 dropped:0 overruns:0 carrier:0
      │       collisions:0 txqueuelen:1000
      │       RX bytes:4259504368 (3.9 GiB)  TX bytes:89822711 (85.6 MiB)
      └─┬─ Package Info
         │ root
         │ Desired=Unknown/Install/Remove/Purge/Hold
         │ | Status=Not/Inst/conf-files/Unpacked/half-inst/trig-avail/Trig-pend
         │ | / Err?=(none)/Reinst-required (Status,Err: uppercase=bad)
         │ ||/ Name          Version      Architecture Description
         │ ||-----|-----|-----|-----|
         || ii codesyscontrol 3.5.11.0   all          V3.5.11.0, Fr 5. Mai 06:08:35 CEST 2017
         └─┬─ Runtime Info
            │ Linux version 4.4.21-v7+ (dc4@dc4-XP513-9333) (gcc version 4.9.3 (crosstool-NG crosstool-ng-1.22.0-88-g8460611)) #911 SMP Thu
            │ Sep 15 14:22:38 BST 2016
            │ PlcStartRasPi[931]: fork child: ppid: 5512
            │ ***** CODESYScontrol DEMO VERSION - runs 2 hours*****
            │ PlcStart[290]: using /etc/CODESYScontrol.cfg as config file
            │ machine: armv7l
            │ timer resolution: 1msec
            │ SysFileGetSize_[254]: stat(/usr/mgmt08.csv):No such file or directory
            │ SysFileGetSize_[254]: stat(/usr/mgmt08.csv):No such file or directory
            └─ Refresh  OK
  
```

```

Scan Raspberry PI

192.168.96.39 (B8:27:EB:B2:26:CA)
192.168.96.58 (B8:27:EB:60:45:8B)
192.168.99.6 (B8:27:EB:6E:30:53)
192.168.99.120 (B8:27:EB:AB:51:68)
192.168.99.126 (B8:27:EB:A4:8E:4C)
192.168.99.169 (B8:27:EB:F5:03:3A)
192.168.99.184 (B8:27:EB:85:8D:3C)
192.168.99.207 (B8:27:EB:B2:26:CA)
192.168.99.235 (B8:27:EB:6A:90:9E)
192.168.101.205 (B8:27:EB:11:CC:34)
192.168.101.234 (B8:27:EB:79:BE:F3)
192.168.101.251 (B8:27:EB:E9:A9:0E)
192.168.102.20 (B8:27:EB:FA:98:52)

OK  Cancel
  
```

Raspberry PI

▲ Login credentials

Username

Password

▲ Select target

IPAddress

▲ Package

Version

Package directory

...

▲ System

▲ Runtime

Devices | POUs | Raspberry PI

Overview

- CODESYS 64bit
- Web-based Online Help
- Notification Center
- Data Breakpoints
- General Improvements



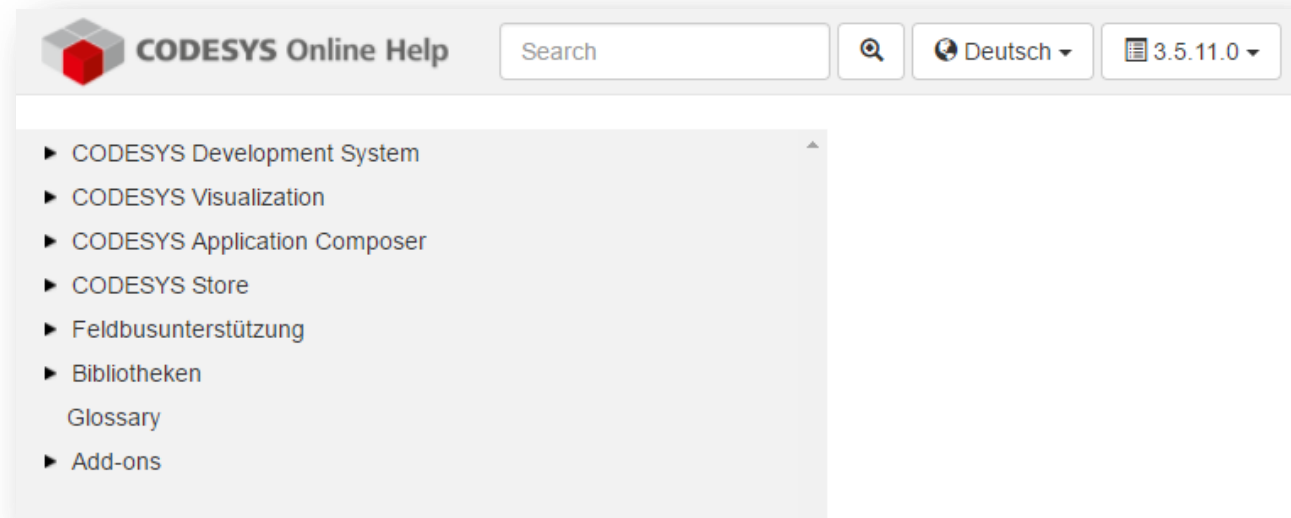


CODESYS 64bit

- 64bit version of CODESYS Development System
 - Total usage of free random access memory
 - Time performance equal to 32bit version
- Add-on compatibility
 - Unified add-on packages for installation on 32bit and 64bit CODESYS versions

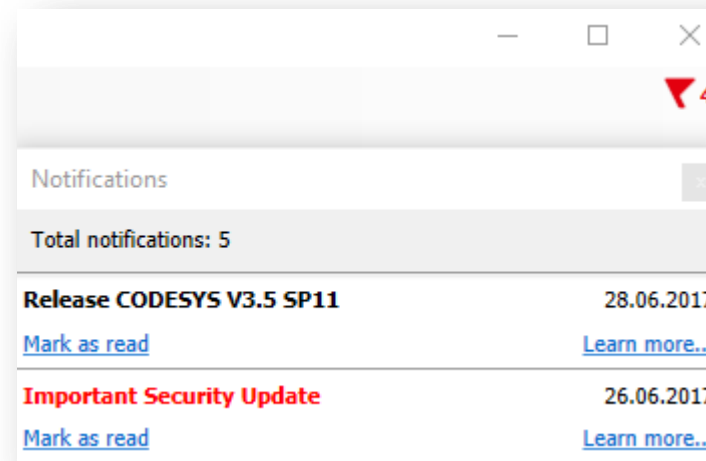
Web-based Online Help

- Access to CODESYS online help via browser
- Usage of HTML technologies
 - Improved search functionality
 - Direct change of languages or CODESYS versions
- Existing online help available as offline fallback or permanent option



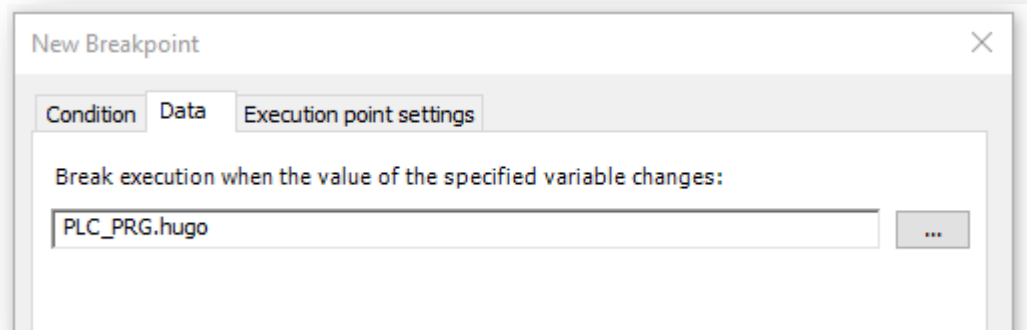
Notification Center

- Information channel for important CODESYS messages like
 - Security Issues
 - Release Information
- No marketing channel



Data Breakpoints

- Breakpoints on value change
- Support for x86/Windows
 - CODESYS Control Win (32/64bit)
 - CODESYS Simulation



Breakpoints					
Application: Application [Device: PLC Logic]					
POU	Location	Instance path	Tasks	Condition	Hit count condition
○ hugo	When variable 'PLC_PRG.hugo' changes		(any)	Break always	Break always

General Improvements

- Ladder
 - Multiselect support
 - Usage of boxes in OR branches
- CFC
 - Forcing of function block inputs
- Improvements in symbol configuration
 - New flag „execute“
 - Support of subrange types
 - Data build from precompile information
- Cross Reference View
 - Improved filtering by name or declaration

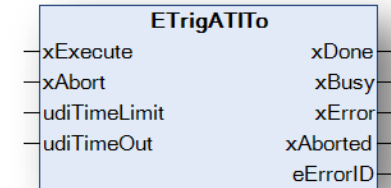
Overview

- Application Libraries
 - PLCopen Behaviour Model Library
 - Collection Library
- General Improvements
 - Application Composer
 - Depictor



Application Libraries

- New library: *Common Behaviour Model*
 - Library for creation of PLCopen compliant function blocks
 - Release of specification by PLCopen: [Link](#)
- New library: *Element Collections*
 - Library for simplified object management
 - List
 - SortedList
 - Queue
 - Stack
 - Hashtables
 - LinkedList
 - TreeNode



+1.0 Common Behaviour Model, 3.5.11.0 (3S - Smart Software Solutions GmbH)
 +1.0 Element Collections, 3.5.11.0 (3S - Smart Software Solutions GmbH)



General Improvements

- Application Composer
 - Support of trend element
 - Persistence manager: generation of file instead of initialisation code
- Depictor
 - Material for objects
 - Demo mode
 - Alarm colour (controlled by boolean)
 - Denavit-Hartenberg-Support for pose definition
 - STL support (3D data format)
 - PLY support (3D data format)

Overview

- Touch Control
- Trace Element
- File Transfer
- HMI SL
- General Improvements



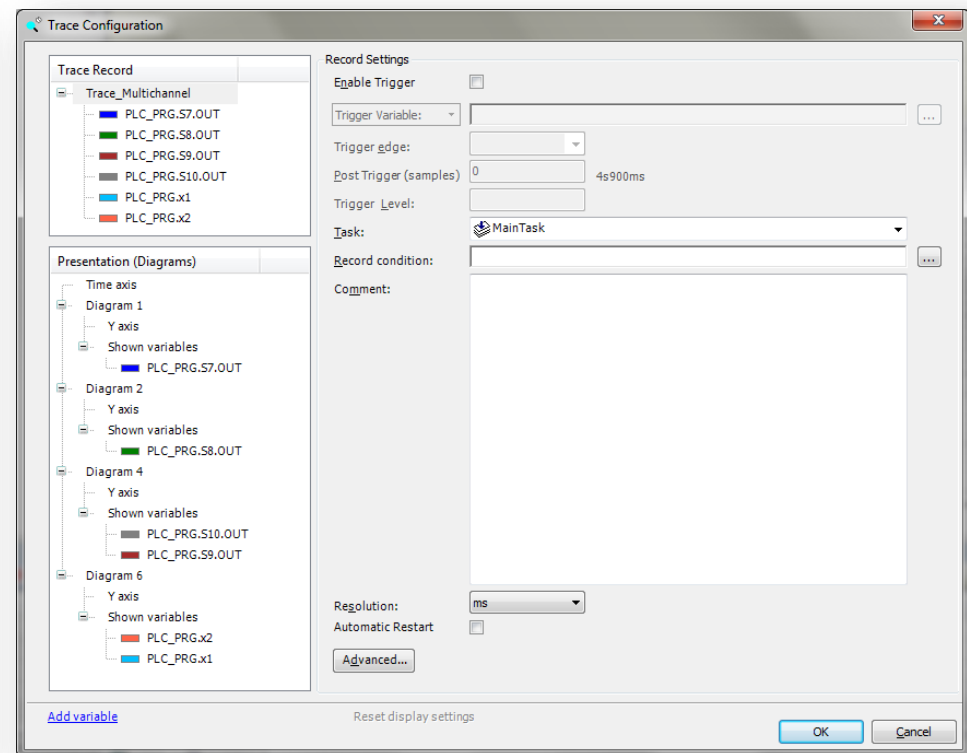
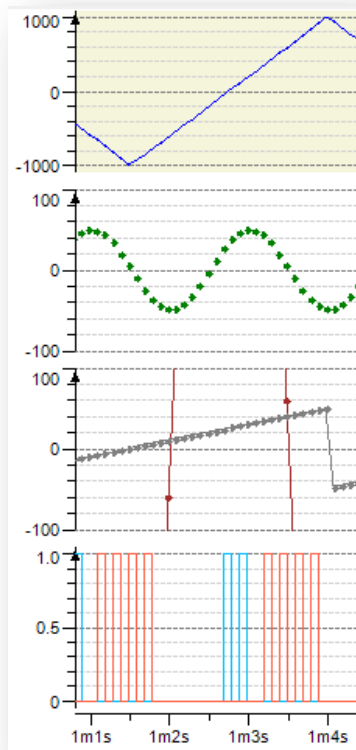


Touch Control

- Scrolling support for visualization elements
 - Frame
 - Tab Control
 - Table
 - Combobox
- Support of momentum scrolling

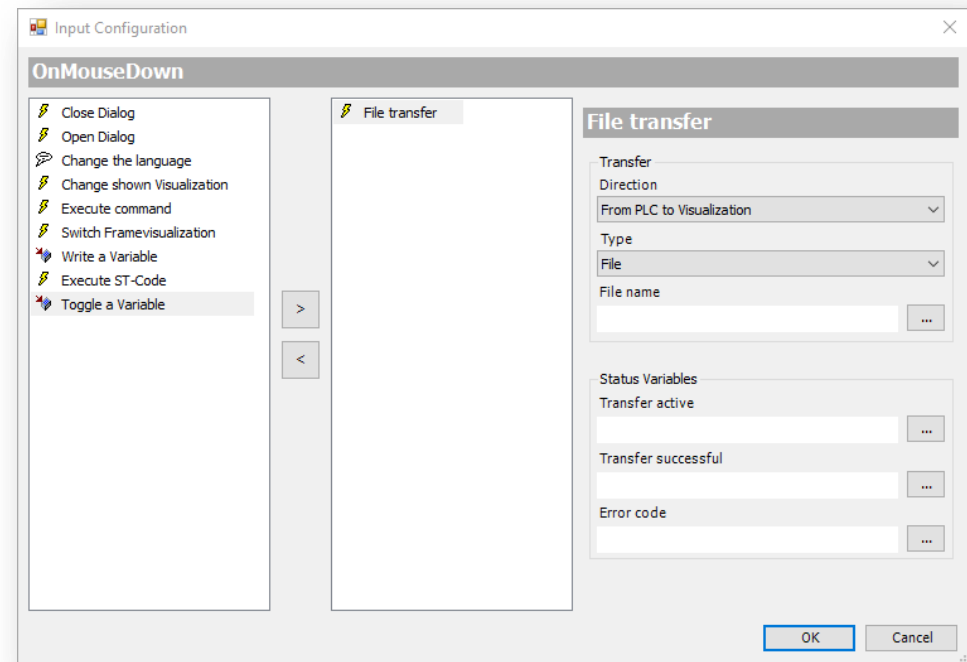
Trace Element

- Free variable distribution on multiple diagrams
 - Multiple diagrams with common time base
 - Multiple variables per diagram



File Transfer

- Transfer of files between PLC and visualization
- Support for Remote TargetVisu and WebVisu
- Transfer of streaming data (from application)
- New input element
- New function in *VisuUtils*





HMI SL

- Automatic renaming of mapped variables in arrays
- MapToExisting/CreateToExisting
 - Automatic change of variable types for sub types
- Offline browsing of symbol data (V2 and V3)
- Display of external traces

General Improvements

- Dialogues
 - Performance improvements for open dialogues
 - Scaling option
 - Opening of dialogues via IEC code (with *VisuUtils* library)
- Offline rotation of elements

Overview

- Robotics
 - New Function Blocks
 - Improvements
- Softmotion/CNC



Robotics

- New function blocks
 - MC_GroupInterrupt/MC_GroupContinue
 - MC_GroupSetOverride
 - MC_GroupSetPosition
- Improvements
 - New jogging mode (similar to CP orientation interpolation mode "Axis")
 - Performance improvement of low priority planning task



SoftMotion/CNC

- **SoftMotion**
 - Limit switch supervision by master
- **CNC**
 - Offline support for SMC_SmoothMerge
 - AP interface for translation of own G-Code dialects

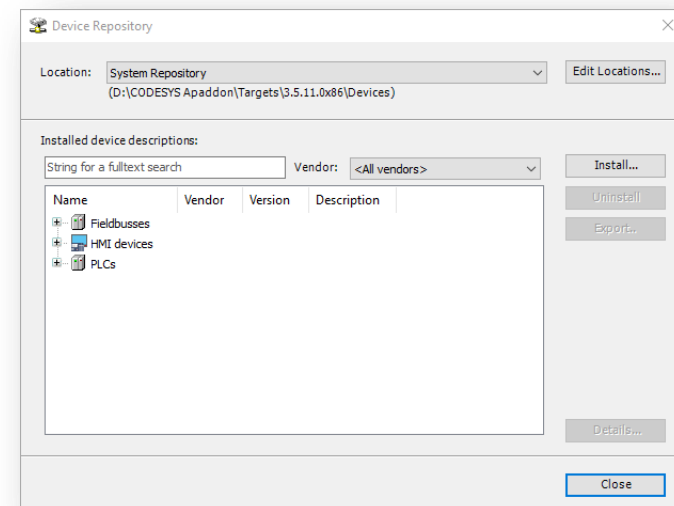
Overview

- General Improvements
- CANopen
- EtherCAT
- EtherNet/IP
- Modbus
- PROFINET



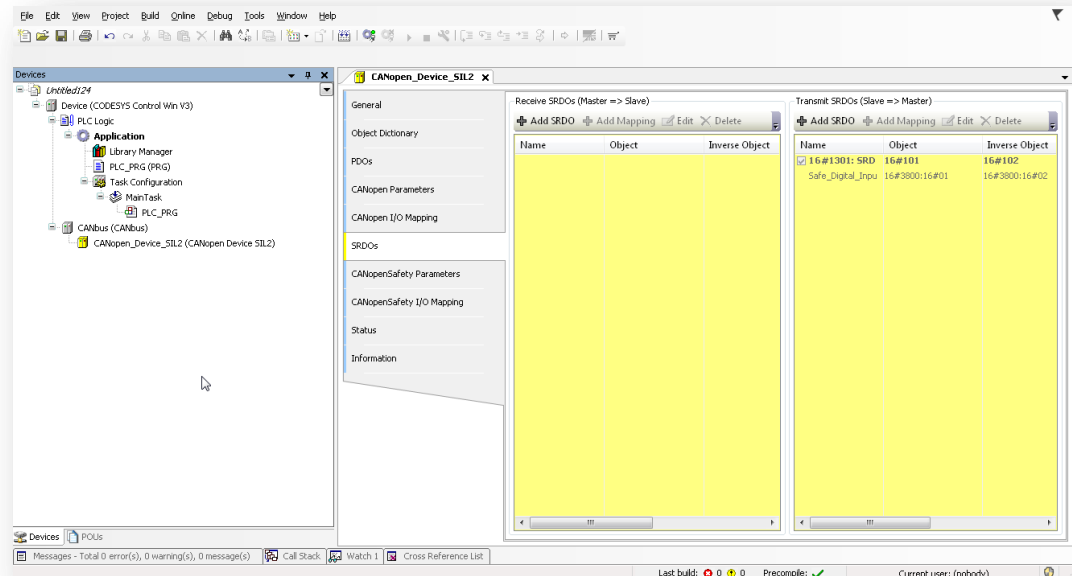
General Improvements

- Search, find and replace support for device configuration
- Search and filter option in device repository dialogue
- Reduced initialization code size for task mapping lists
- Improved I/O configuration (when initial value of declaration and default value of configuration are different)



CANopen

- CANopen Configurator
 - Improved update behaviour
 - Evaluation of access rights for objects
 - Reduced code size of SDO list
- CANopen Safety Slave Configurator



EtherCAT

- Change of modular device profile
 - I/O channels of modular devices (MDPs) located at modules
 - Connection of logical devices as modules \Rightarrow safety support for MDP devices
- I/O driver
 - AL status codes as text outputs
 - Parallel usage of EtherCAT and PROFINET
 - Elimination of possible priority inversion \Rightarrow new device description and library needed



EtherNet/IP

- Support of device scanning
- Performance improvements
 - EtherNet/IP Configurator: insertion of devices in device tree
 - EtherNet/IP Scanner & Adapter: copy of I/O data
- EtherNet/IP Scanner (CIFX): rework of acyclic services



Modbus

- Modbus Serial Master
 - Support of ASCII mode
- Modbus RTU Device
 - Adaption of Modbus TCP features
 - Support of bit access functions
 - Data checks

PROFINET

- Parallel usage of multiple PROFINET controllers or devices
- Support of reconfiguration at runtime
- PROFINET Controller
 - Function blocks for scan, read and write of device parameters
 - Function blocks for read and write of identification and maintenance data
- PROFINET/IO-Link
 - Function block for simplified usage of I/O-Link devices
- Diagnosis
 - Function block for analysis of diagnosis data
- Documentation
 - Extended *CommFB* documentation and end user documentation for *ProfinetCommon* library



Overview

- AS-i Support
 - ⇒ End of sales, care, integration and support (discontinuation - finished)

- Support of Windows XP and Windows Vista for
 - CODESYS Automation Platform SDK / CODESYS Development System
 - CODESYS OPC Server
 - CODESYS Gateway
 - CODESYS HMI
 - CODESYS Control Win
 - CODESYS RTE / CODESYS SoftMotion RTE
 - CODESYS RTE / CODESYS SoftMotion RTE (for Beckhoff CX)
 - ⇒ End of support (discontinuation - finished)



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