

Features & Improvements CODESYS V3.5 SP13

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Fieldbus

Overview

- Multicore
- CODESYS Control for Linux SL
- SIL2 Compound Safety PLC
- Configurable set of different symbols for separate clients
- OPC UA: User management
- PLCHandler: Backup & Restore IEC Applications
- General improvements



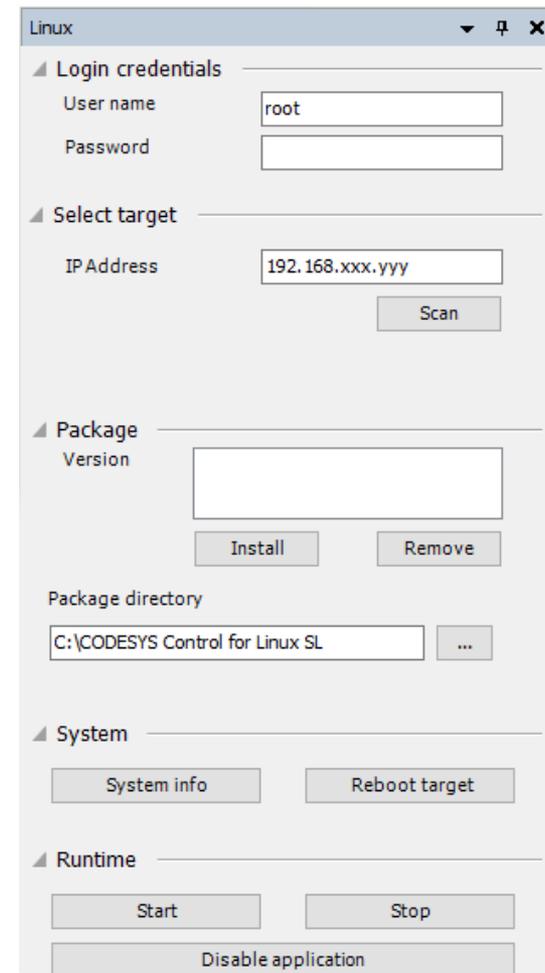
Multicore

- Consistent read / write of 64Bit data types
- Define Multicore-specific target settings
- Extended task group configuration for core distribution
 - Free floating: OS dynamically assigns tasks to cores
 - Fixed pinned: Tasks are bound to the same core (decision by runtime)
 - Sequentially pinned: All tasks in this group are bound by the runtime to different cores
 - Configuration of task groups with defined core distribution
 - Dedicated core: All tasks in this group are bound by the runtime to exactly this core
- Display of variable usage in different tasks
- Monitor core load through device monitoring



CODESYS Control for Linux SL

- Linux Runtime for X86 (64 Bit) – Debian
- Features
 - Multicore
 - SoftMotion
 - WebVisu
 - OPC UA Server
 - Security Features (encrypted communication/bootapp/etc.)
 - Ethernet based fieldbus



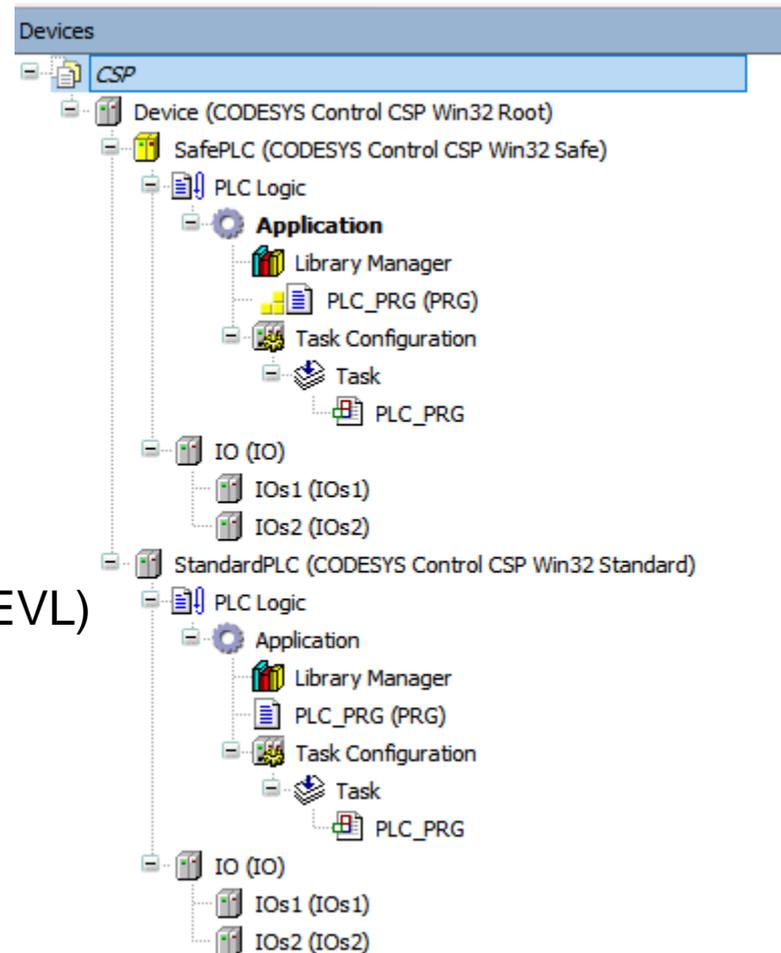
The screenshot displays the 'Linux' configuration window with the following sections:

- Login credentials:** Fields for 'User name' (containing 'root') and 'Password'.
- Select target:** Field for 'IP Address' (containing '192.168.xxx.yyy') and a 'Scan' button.
- Package:** Field for 'Version' and buttons for 'Install' and 'Remove'.
- Package directory:** Field containing 'C:\CODESYS Control for Linux SL' and a browse button ('...').
- System:** Buttons for 'System info' and 'Reboot target'.
- Runtime:** Buttons for 'Start', 'Stop', and 'Disable application'.



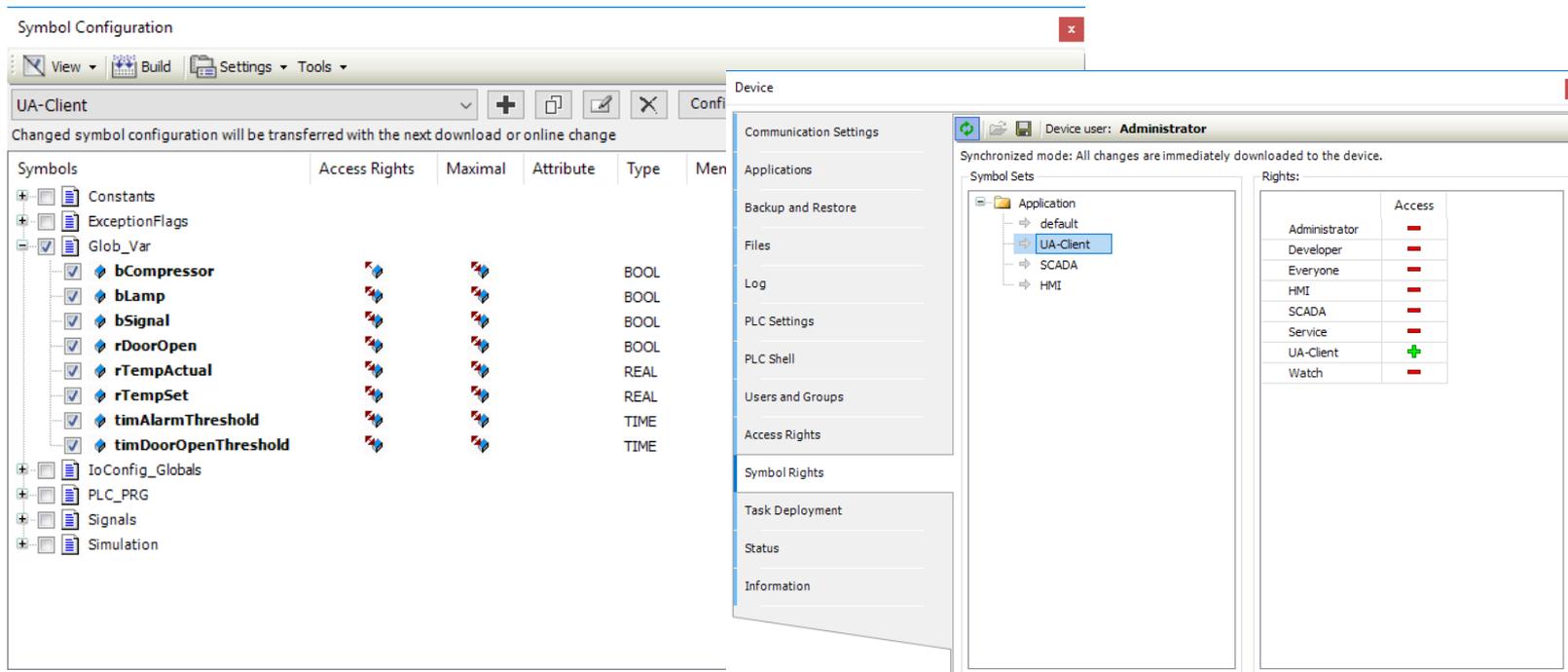
SIL2 Compound Safety PLC

- 1 Target
- 2-n Runtimes
 - 1 SafetySIL2 Runtime
 - n Standard Runtimes
- 2-n Applications
 - 1 Safety Application (certified)
 - Exchange of data possible (EVC/EVL)



Configurable set of different symbols for separate clients

- Create symbol sets within the symbol configuration
 - Define access rights for each symbol set
 - Select different symbols per symbol set
 - Refer symbol sets to user groups



The screenshot shows two overlapping windows from the CODESYS software. The background window is 'Symbol Configuration' for a 'UA-Client'. It displays a tree view of symbols under 'Glob_Var' with columns for 'Access Rights', 'Maximal', 'Attribute', 'Type', and 'Men'. Symbols include bCompressor, bLamp, bSignal, rDoorOpen, rTempActual, rTempSet, timAlarmThreshold, and timDoorOpenThreshold. The foreground window is 'Device Manager' for a 'Device' user: Administrator. It shows a tree view of 'Symbol Sets' under 'Application' with sub-items 'default', 'UA-Client', 'SCADA', and 'HMI'. A 'Rights' table is visible on the right side of the Device Manager window.

User	Access
Administrator	-
Developer	-
Everyone	-
HMI	-
SCADA	-
Service	-
UA-Client	+
Watch	-



OPC UA: User management

- Login to OPC UA Server with user name / password combination
- Logon via the user administration of the PLC
- Control of access rights to the OPC UA Server for the user groups
- Before services are processed, these rights are checked
- Access rights can be checked down to object level



PLCHandler Backup & Restore IEC Applications

- For PLCs from version V3.5.8.0
- New interfaces are available in the PLCHandler for both operations:
 - Backup IEC Applications
 - Restore IEC Applications
- Both interfaces work synchronously



General improvements

- Update CodeMeter SDK 2.1
- CmpTLS: Support of ECC
 - Webserver now supports ECDH Ciphersuites by default
 - With Webclient also connection to websites with ECDH possible
- SysSocket2: Support of Server Name Indication
 - Connection to cloud-based TLS servers possible.
 - New socket options: `SOCKET_IPPROTO_TLS`, `SOCKET_SO_HOSTNAME`



Runtime



Engineering



Visualization



Motion + CNC



Fieldbus

Overview

- CODESYS in a sandbox
- AP Modularization
- Licensing improvements
- General improvements



CODESYS in a sandbox

- No more GAC
- Programming system now "self-contained"
- Completely isolated installations without mutual interference
- Migration Assistant for user settings



AP Modularization

- Target:
 - Remove interdependencies between plug-ins in the Automation Platform
- Create infrastructure
- Definition of architecture layers
- Assignment of all plug-ins to a legacy layer



Licensing Improvements

- Clearer division into device and workstation licenses ("In which container must the license be installed?")
- Backup and restore of licenses
- Support of multiple Firm Codes for plug-ins and libraries
- **All AddOns from the next version on can be purchased dongle-free via pure software licenses!**



Runtime



Engineering



Visualization



Motion + CNC



Fieldbus

General improvements

- Communication: Access to a controller via host name / DynDNS name
- User management: Improvement of data security
- CFC: Features for Process Automation
 - Support of qualified values
 - Code generation for automatic assignment and monitoring
 - Forcing of inputs now without restrictions
- Task Locale Variables
- ABSTRACT as new keyword
- Filter for Cross References
- Offline status field for "Up To Date" application



Runtime



Engineering



Visualization



Motion + CNC



Fieldbus

Overview

- HMI Toolkit for Linux
- General improvements



HMI Toolkit for Linux

- Ability for OEMs to create HMI devices under Linux



Runtime



Engineering



Visualization



Motion + CNC



Fieldbus

General improvements

- Stabilization of XY Chart
- Trace
 - Filling curves
 - Curls as markings
- Exact determination of element outlines
- HMI
 - Performance improvements for formulations
 - Diagnostics for application code



Overview

Genral improvements:

- Cam-Editor
- CNC
- Robotics



Runtime



Engineering



Visualization



Motion + CNC



Fieldbus

General improvements

- **Robotics**
 - Support for pure orientation movements with constant TCP
 - PTP true to the path (path of the robot does not change due to override)
 - Waiting on the track
 - Improved blending
 - Improved quality of trajectory with high dynamics
- **CNC**
 - Support for subroutines in G code
 - Support for G-code expressions
 - Support for variables in G code
- **Cam-Editor**
 - Improved editing of cams



Overview

- CODESYS KNX
- Predictive/Preventive Maintenance
- Cloud connectivity
- General improvements



CODESYS KNX

- KNX IP support for building automation
- Integration of KNX stack as runtime component
- Editor for KNX objects in CODESYS
- IO driver for KNX
- Connection to ETS5 programming software



Predictive/Preventive Maintenance

- Add support for function block for I/O channels

Variable	Mapping	Channel	Address	Type	Unit	Description
Application.EL2002_Output_Boot.xOutput	FB	Output	%QX1.4	BIT		Output
		Output	%QX1.5	BIT		Output

Variable	Mapping	Type
EL2002		ETCSlave
EL2002_Output_Boot		Output_Boot

Select function block

Type	Mapping	Channel	Address	Type	Unit	Description
Application						
Relay_Test						
Relay_Test1						
PredictiveID						
Output_Boot						
Relay						

Output_Boot (FB)

FUNCTION_BLOCK Output_Boot

InOut:

Scope	Name	Type
Input	xInput	BOOL
Output	xOutput	BOOL
	udiCount	UDINT



Cloud connectivity

- Azure IoT Hub Client
 - Library for communicating with the cloud 'Azure IoT Hub' from Microsoft
 - Sending device messages (D2C messages)
 - Receiving cloud messages (C2D messages)
 - Updating/reading device twins (JSON file with device status information)
- MQTT Client (Message Queue Telemetry Transport)



General improvements

- BACnet
 - Update to Revision 14
- CANopen Device
 - Support of CANfox USB Dongle
- EtherCAT
 - TwinSafe SC modules
 - Function blocks to query state of slave, reinit slave, check DC
 - Manual changes for MDP devices
 - Implement link loss/detect delay time



Runtime



Engineering



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Motion + CNC



Fieldbus

General improvements

- PROFINET
 - Link Status
 - CommFB Library: Function Blocks for Field Devices
 - Scan without started Application
 - ModuleState and SubmoduleState
 - DataTypes of GSDML V2.33



Runtime



Engineering



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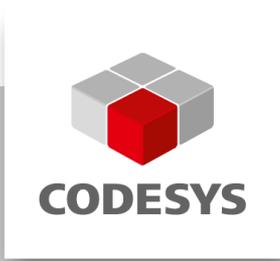


Fieldbus

General improvements

- EtherNet/IP
 - Conformance to CT15
 - Basic support for modular EDS files





Inspiring Automation Solutions

Thank you for your attention.

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