

# Features & Improvements CODESYS V3.5 SP10

**1**

Runtime

**2**

Engineering

**3**

Visualization

**4**

Motion + CNC

**5**

Fieldbus

**6**

Discontinued CODESYS Products

## Overview

- Security Features
- Hardware Watchdog Support
- Network Scan Improvements
- Minor Improvements





## Security Features

- New runtime component: SecurityManager
- X.509 certificate management
  - Support of self-signed certificates
  - Support of CA signed certificates
  - Configuration via PLC shell commands and file transfer
  - Runtime component *OpenSSL* required
- Encryption and signing of boot application and application download
- Encryption of CODESYS communication
- Library for encrypted TLS communication



## Hardware Watchdog

- New runtime component: Supervisor
- Monitoring of „vital runtime functions“ e.g.
  - cycles
  - memory integrity of runtime system
  - state transitions of application (run/stop)



## Network Scan Improvements

- Additional device information for network scan
  - Number of communication channels
  - Support of encrypted communication
  - Communication block driver
  - Serial number
  - Extended configuration possible for device manufacturers
- Configuration of scan timeouts



## Minor Improvements

- Accelerated runtime shutdown
- Accelerated logout after runtime shutdown

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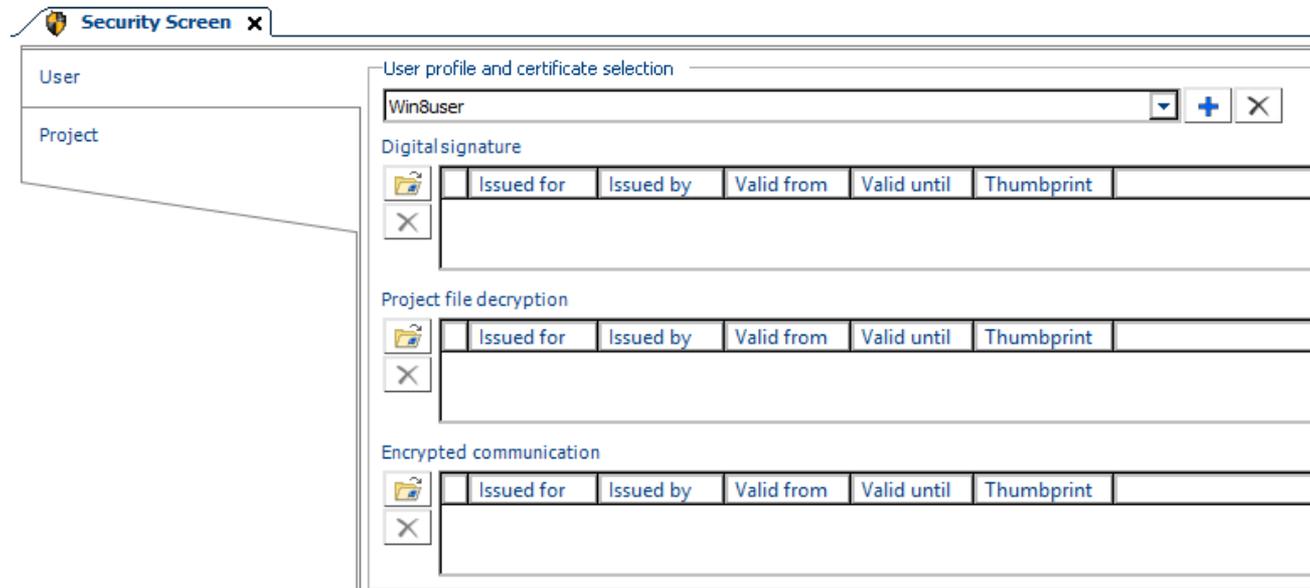
## Overview

- Security Features
- Application Composer Improvements
- Compiler: Device Application
- Debugging: Call Tree View
- Minor Improvements



## Security Features

- Encryption and signing of CODESYS files
- Encryption of CODESYS communication
- User interface for security configuration

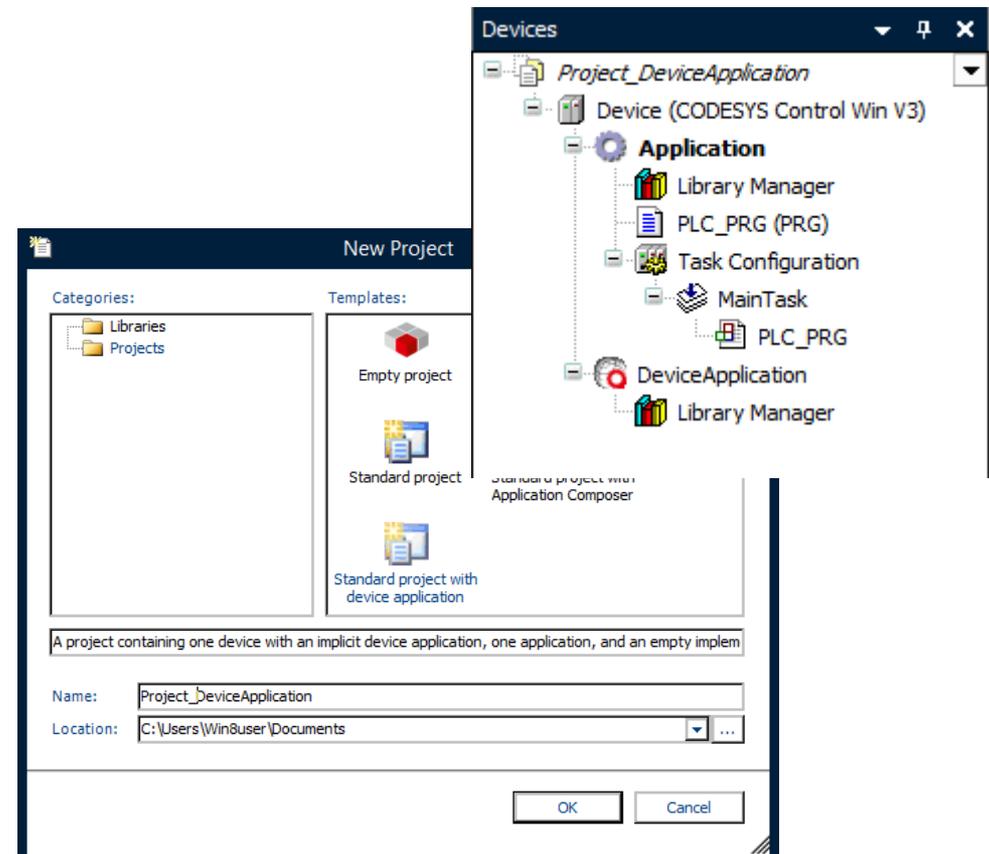


## Application Composer Improvements

- Generator improvements
  - Standard generator: generation of symbol configuration
  - Device generator: usage of pre-defined device configuration
  - Visu generator: configuration of toplevel name tabs
  - Alarm generator: selectable visualisation template
- Persistence manager
  - Persistent storage of WSTRINGS
  - Usage of placeholder *\$ac\_persistence\$*
- New commands
  - Generation of image pool and items
  - Build of extension moduls from existing modul instances

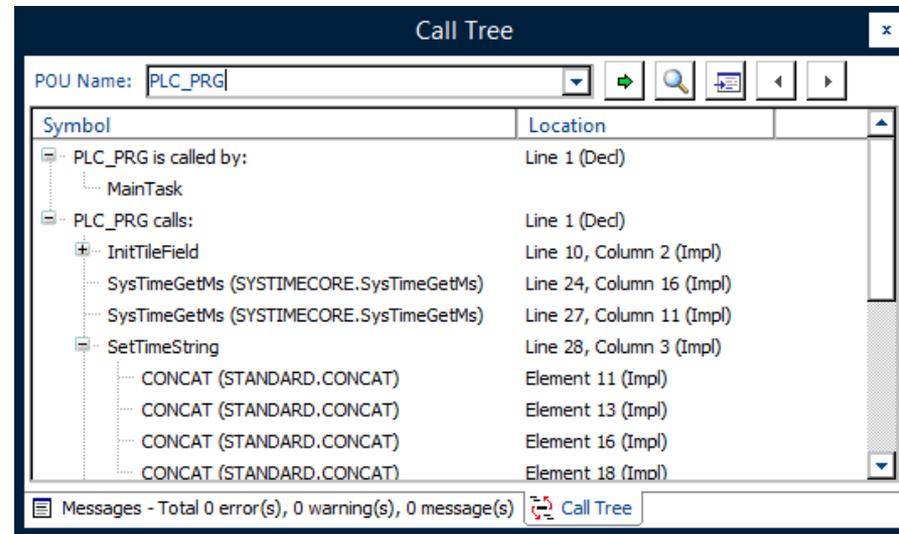
## Compiler: Device Application

- Logical separation of application code (dynamic part) and device code (static part)
- Project template available
- New structure in device tree
- Benefits
  - Faster compile and download
  - Faster online change



## Debugging: Call Tree View

- New debugging view for project engineers: Call Tree
- Known feature in CODESYS V2.3 / CODESYS Profiler
- Supplement to Cross Reference view



Symbol	Location
PLC_PRG is called by:	Line 1 (Decl)
MainTask	
PLC_PRG calls:	Line 1 (Decl)
InitTileField	Line 10, Column 2 (Impl)
SysTimeGetMs (SYSTIMECORE.SysTimeGetMs)	Line 24, Column 16 (Impl)
SysTimeGetMs (SYSTIMECORE.SysTimeGetMs)	Line 27, Column 11 (Impl)
SetTimeString	Line 28, Column 3 (Impl)
CONCAT (STANDARD.CONCAT)	Element 11 (Impl)
CONCAT (STANDARD.CONCAT)	Element 13 (Impl)
CONCAT (STANDARD.CONCAT)	Element 16 (Impl)
CONCAT (STANDARD.CONCAT)	Element 18 (Impl)

## Minor Improvements

- Performance Improvements
  - Prevention of external file download at „fast online change“
  - Accelerated login/logout
- Project file: „Save as old version“ considers add-ons
- Project recovery
- Saver passwords for user management
- Search in non-compiled libraries
- NWL: improved display of comments

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## Overview

- **\*New Product\*** CODESYS HMI SL
- Minor Improvements





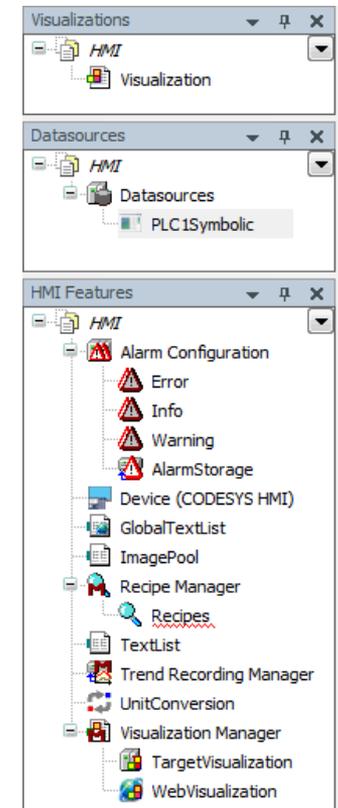
## CODESYS HMI SL

- PC-based display of visualizations (HMIs) for one or multiple controllers
- Visualization of CODESYS V3 controllers
  - Symbolic data access
  - Data access via addresses
- Visualization of CODESYS V2.3 controllers
  - Symbolic data access
- Wizard for HMI project creation

## CODESYS HMI SL

- Additional HMI-specific engineering view
- Separation of controller and HMI application development
- New data access mechanism: data sources
  - Replacement of data server
  - Improved configuration
  - Online diagnosis for connection state

Datasource					
HMI					
Variables   Type Mappings   Communication   General and Diagnosis					
Browse					
Local variable	Access Right	Update by default	Create or map	Mapping type	Remote variable
Application		<input type="checkbox"/>		Application	Application
PLC_PRG		<input type="checkbox"/>		PLC_PRG	PLC_PRG
arr		<input type="checkbox"/>		ARRAY[0..2] OF INT	arr
arrStruct		<input type="checkbox"/>		ARRAY[1..2, 3..4] OF DUT_WithArray	arrStruct
arrArrStruct		<input type="checkbox"/>		ARRAY[0..1] OF ARRAY[0..0] OF DUT_A	arrArrStruct
inst1		<input type="checkbox"/>		DUT_Outer	inst1
a		<input checked="" type="checkbox"/>		BOOL	a
x		<input type="checkbox"/>		DUT_A	x
inst4		<input type="checkbox"/>		DUT_X_2	inst4
inst5		<input type="checkbox"/>		DUT_A_3	inst5
arrSubrangeReversed		<input type="checkbox"/>		ArraySubrangeReversed	arrSimple
HMI.FillingLevelA		<input type="checkbox"/>		INT	Application.PLC_PRG.arrSimple[200]



The screenshot shows the HMI SL interface with three main panels:

- Visualizations:** Shows a tree view under 'HMI' with a 'Visualization' folder.
- Datasources:** Shows a tree view under 'HMI' with a 'Datasources' folder containing 'PLC1Symbolic'.
- HMI Features:** Shows a tree view under 'HMI' with various features including:
  - Alarm Configuration
  - Error
  - Info
  - Warning
  - AlarmStorage
  - Device (CODESYS HMI)
  - GlobalTextList
  - ImagePool
  - Recipe Manager
  - Recipes
  - TextList
  - Trend Recording Manager
  - UnitConversion
  - Visualization Manager
  - TargetVisualization
  - WebVisualization



## Minor Improvements

- Multitouch: scrolling in tables via gesture
- Alarm management
  - Latch variables (STRING)
  - Sorting of columns in alarm table
  - Colour configuration for single columns in alarm table
- Project compare for text lists with merge function
- Recipe management
  - Drag&Drop of variables in recipe definition
  - New command: load of recipes from device
- Trace: Snapping of curser to measuring points



## Minor Improvements

- Extended settings in user management
  - Maximum number of authentication trials
  - Permanent or temporary user lock
- Improved memory management
- Improved group functions
- Text export and import from enumerations with text lists
- Performance improvements for all online visualizations

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## Overview

- Robotics





## Robotics

- Certified function blocks according to PLCopen for Motion Control Part 4
- New Robotics Feature: Continuous Path (CP)
  - Interpolation on a path (e.g. on a line or arc)

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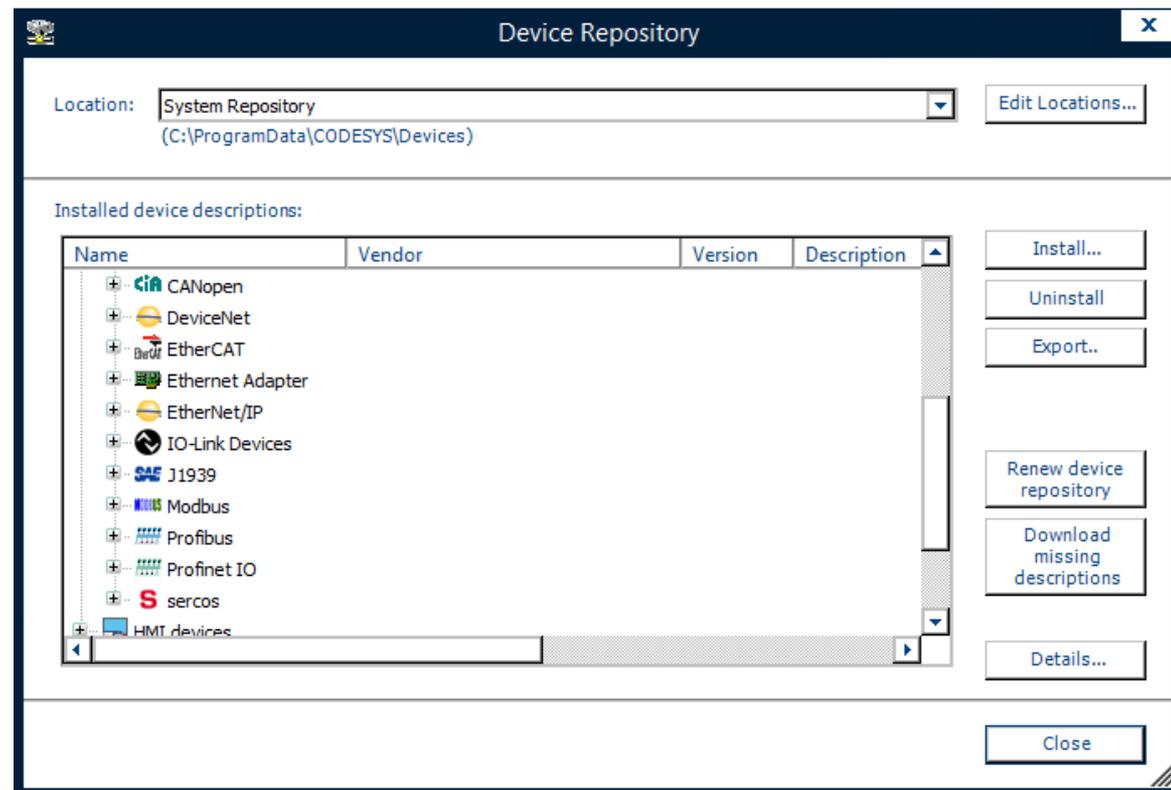
## Overview

- General Improvements
- CANopen
- EtherCAT
- Modbus
- PROFINET
  - **\*New Product\*** CODESYS PROFINET Device



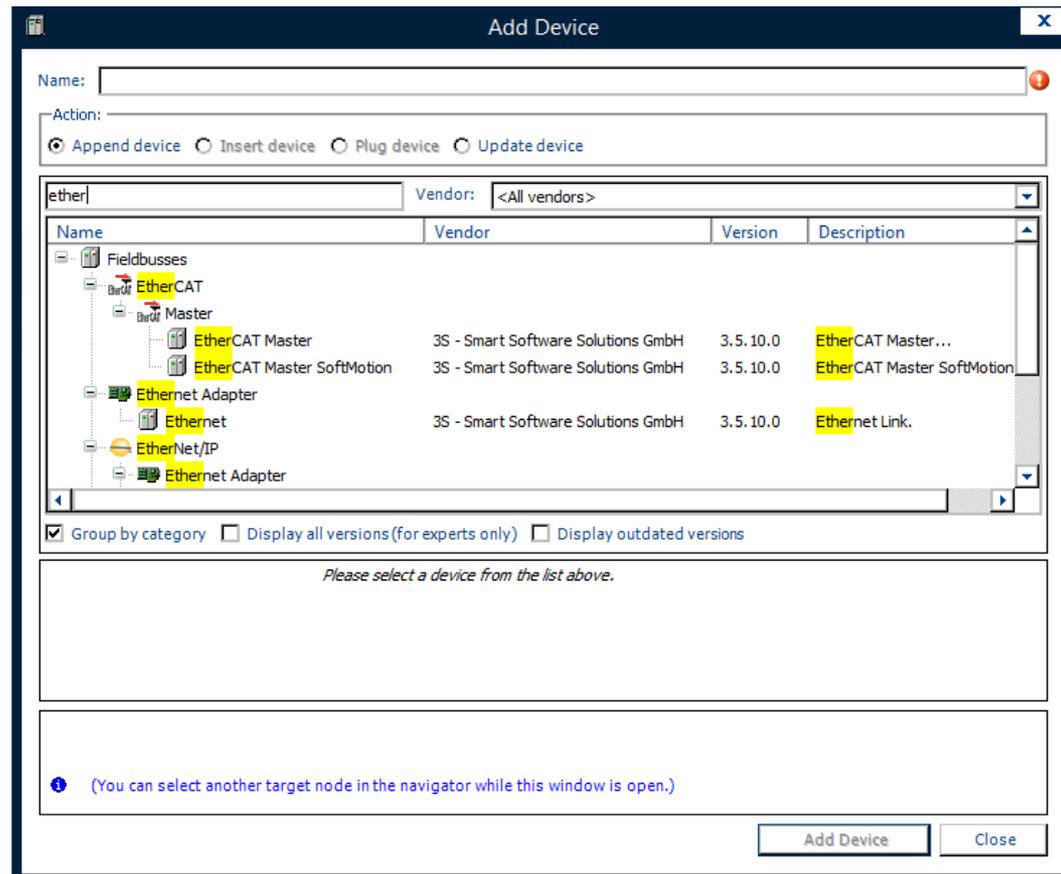
## General Improvements

- Export of device descriptions
  - Generation of zip folder with required device files



## General Improvements

- Search for devices in “Add device”





## CANopen

- Multiple stack support
  - Different CAN stacks share one physical CAN port
- Reduced footprint for scan on compact runtimes
- PCAN
  - Extended support of PCAN interfaces

# EtherCAT

- New history object

General

---

Process Data

---

Startup parameters

---

Diag History

---

EtherCAT Parameters

---

EtherCAT I/O Mapping

---

Status

---

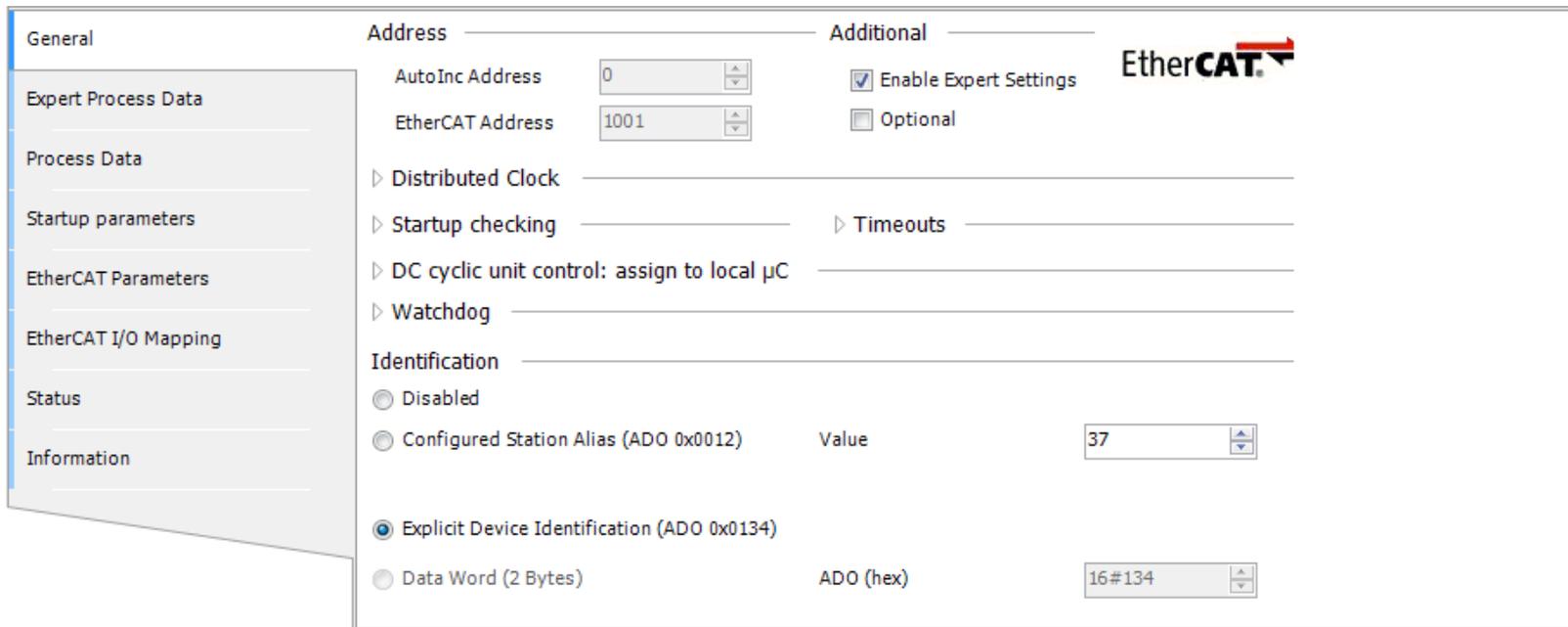
Information

Update History
Auto Update
Only new messages
Ack. Messages

Type	Flags	Timestamp	Message
 Info	N	04.11.2016 12:54:22 98ms	(13330) Modul 3: Ausfall der Peripherieversorgung
 Error	N	04.11.2016 12:54:21 778ms	(13330) Modul 3: Ausfall der Peripherieversorgung
 Info	N	04.11.2016 12:54:21 765ms	(13330) Modul 3: Ausfall der Peripherieversorgung
 Error	N	04.11.2016 12:54:21 580ms	(13330) Modul 3: Ausfall der Peripherieversorgung
 Info	N	04.11.2016 12:52:18 672ms	(35104) Modul: 2 Bereichsunterschreitung Kanal 3
 Warning	N	04.11.2016 12:52:18 655ms	(35104) Modul: 2 Bereichsunterschreitung Kanal 3

# EtherCAT

- New identification option
  - Explicit Device Identification handling



The screenshot shows the EtherCAT configuration dialog box with the following settings:

- General** (selected in the left sidebar)
- Address**:
  - AutoInc Address: 0
  - EtherCAT Address: 1001
- Additional**:
  - Enable Expert Settings:
  - Optional:
- Identification** (expanded section):
  - Disabled:
  - Configured Station Alias (ADO 0x0012):  Value: 37
  - Explicit Device Identification (ADO 0x0134)**:
  - Data Word (2 Bytes):  ADO (hex): 16#134

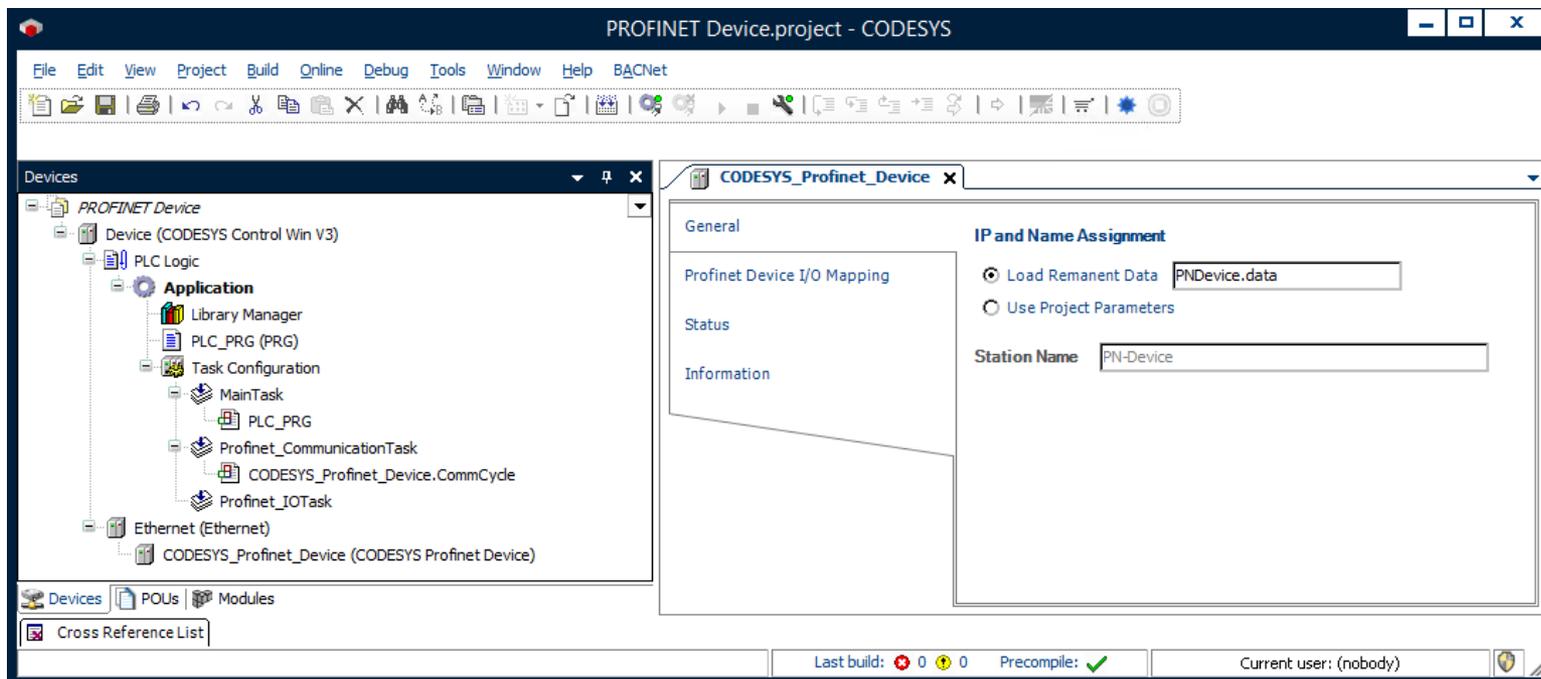


## Modbus

- CODESYS Modbus RTU Master
  - Programmatic control of Modbus channels
  - Trigger of Modbus slave channels with function block inputs and outputs

# PROFINET

- CODESYS PROFINET Device (Slave)
  - IEC 61131-3 stack library



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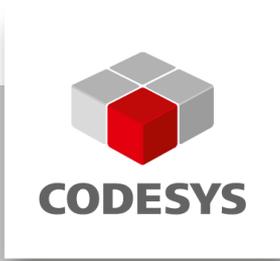
Discontinued CODESYS Products



# Discontinued CODESYS Products

## Overview

- CODESYS FDT Frame
  - End of support
- CODESYS DeviceNet
  - End of sales, care, integration and support
- AWL editor
  - End of sales and care
  - Deactivated, but usage still possible



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