Comparison CODESYS V 2.3 vs CODESYS V.3

Brief overview selected features

Version: 1.0.0.0
File: Vergleich CODESYS V2 zu V3_en.docx
This comparison is based on CODESYS V3.5.3.

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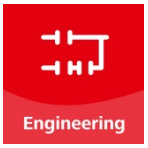
1 Overview Engineering Features



Functions	CODESYS V2.3	CODESYS V3
Object-oriented programming	Actions without designated variable space	Complete OOP with methods, interfaces, classes, extensions of base classes, polymorphism
Component-oriented structure of the development system	Monolithic system	Yes. Device manufacturers can define the usage of components using version profiles. Using so called packages users can later install required plug-in components. Such components can be created by 3S-Smart Software Solutions, device manufacturers or third-party suppliers
Multi PLC (several controllers can be programmed simultaneously in one single project)	-	Yes. Including customized library and task management, global variable lists at application level
Multi application (several independent applications on one controller and within one single project)	-	Yes. Including customized library and task management, global variable lists. Sub applications may be underlaid.
Usage of objects on several devices	Only using libraries or with import.	In multi-resource implementation through call of objects from global POU tree.
Tool is extendable on the basis of well-defined interfaces (e.g. for editors, configurators, wizards etc.)	Not standard!	Additional plug-ins which can also replace other components can be created on the basis of the CODESYS Automation Platform (SDK for device manufacturers).
Open access to system interfaces	-	Yes, delivered along with the CODESYS Automation Platform
Switch between LD/ FBD / IL view	LD / FBD with restrictions	Yes. Offline and Online
File management for all sorts of files directly in the project	-	Yes. Files like PDF, JPG or DOC for example can be filed directly in the project tree
Customizable user interface	-	Yes, docking views on different displays
Customizable menus	-	Yes.
Customizable hot keys	-	Yes.
Components (editors, compilers etc.) can be versioned and used separately	Programming system is one monolithic version, compiler version selectable	Yes. Optional management using add-on tool ”Installation and Profile Manager IPM“ (only for users of the CODESYS Automation Platform)
Multi selection in the project tree	-	Yes, operation affects all selected objects.
CFC editor (free hand FBD)	Yes.	Yes, additional page-oriented CFC
Project encryption	Yes, using a password	Yes, with a password and additionally with the CODESYS Security Key (USB dongle) with add-on functionality.

Functions	CODESYS V2.3	CODESYS V3
Textual editors (e.g. ST, declaration) with folding, line break, auto complete	-	Yes. Folding on the basis of indention also for multiline comments.
Debuggable libraries	-	Yes. Source code of the library required. Can be added at a later point in time.
Proprietary text-based exchange format for import / export	Yes.	Yes.
Data exchange via PLCopen XML format	-	Yes, import and export
Call interface for automated commands	Yes, customized batch mode (internal / external)	Yes, using standard language Python with comprehensive library for access to CODESYS functionality
User management	Yes, with eight predetermined user groups and rights	Yes, freely configurable with definable user rights.
Library management	In the project or using file directories for device and tool-specific libraries	Management in the tool with integrated library repository. Several repositories possible. Additional library management based on the libraries deposited in the repository.
Library versioning	Using date / time Different versions cannot be used in parallel	Using a comprehensive versioning concept with version number and name space.
String access as array	-	Yes.
Pre-compiled libraries	-	Yes.
Data type UNION	-	Yes.
Unicode support	-	Yes.
Conditional compile	Only with restrictions	Yes. Several pragmas available as compiler directives.
Auto declare with data type detection	-	Yes.
Breakpoints	Fixed breakpoints	Fixed and conditional breakpoints. Watch points in preparation
Any expressions in initializations of variable declarations	-	Yes.
CONTINUE in loops	-	Yes.
Single line comments	-	Yes, delimiter //
Extended name spaces	-	Yes.
Sampling trace	Yes.	Yes. Significantly extended functionality
Integrated UML support	-	As a fully integrated add-on tool: for class and state machine diagram, available in the CODESYS Store.

Functions	CODESYS V2.3	CODESYS V3
Static code analysis	Check of four typical problem sources	Check of four typical problem sources just like in CODESYS V2.3. Plus many additional test cases (>>50, for example a check of the IEC 61131-3 functionality) within the scope of the optionally integrable add-on tool CODESYS Static Analysis which is available in the CODESYS Store. Additional test cases can be added and existing test cases extended with the CODESYS Automation Platform.
Integrated source code management	Yes, connected using the CODESYS ENI Server	Yes. Integrated connection to Apache Subversion ®: CODESYS SVN which is part of the optional add-on CODESYS Professional Developer Edition. Available in the CODESYS Store.
Integrated execution of automated application tests.	-	Yes, in form of a fully integrated add-on tool: CODESYS Test Manager used for automated module, system, unit and regression tests. Available in the CODESYS Store.
Automatic creation of controller applications with pre-defined modules	-	Yes, using the CODESYS Application Composer which can optionally be fully integrated into the CODESYS Development System. The CODESYS Application Composer can be used to engineer complete applications without any programming knowledge. Automated creation of visualization screens for executing the application and device diagnosis. License for the usage and creation of CODESYS Application Composer modules available in the CODESYS Store.

2 Overview Runtime Features

Functions	CODESYS V2.3	CODESYS V3
Adaptable runtime system using SDK	Yes. Different versions for different requirements	Yes, mainly single source runtime system
Runtime system for 16 bit CPU platforms (Infineon C16x)	Yes.	-
Runtime system for realtime Linux	Basic support for different derivatives	Yes. Product support for OSADL Linux
Runtime system for 64 bit CPU platforms	-	64 bit runtime system in preparation
Routing functionality in the runtime system	-	Yes, as scalable component.
OPC server included	Yes.	Yes. Standardized OPC specification V2 server, also usable for CODESYS V2 devices.
Symbolic access to variable data via CODESYS PLCHandler	Yes.	Yes. Standardized interface for access to variables of CODESYS V2 devices.
Component-oriented structure of the runtime system	No. Individual functions can be switched-off using compile switch.	Yes. Freely scalable and extendable. Dynamically or statically linkable or mixed linking

Functions	CODESYS V2.3	CODESYS V3
Exception handling	Only rudimentary	Fully covered through exception handling, try/catch mechanism available.
I/O driver interface	Yes, only drivers in C (usually only one driver).	Yes. Any number of drivers in C or IEC possible.
Event logger	-	Yes. Instantiation possible for customized loggers. Extendable with customized back ends.
User management	No, only password as login protection.	Yes. Freely configurable and extendable user management.
Interface for customization	Yes, with a customer module.	Yes. Extendable with one or several components. Standard components can be replaced by customized components.
OPC UA	- Indirectly supported by stand alone CODESYS V3 OPC UA Server	Will be available as runtime system component and standalone OPC UA Server.
Support WIBU CodeMeter Technology	-	Yes, integration optionally available as independent component. Encryption of the boot application possible.

3 Overview Fieldbus Features

Functions	CODESYS V2.3	CODESYS V3
Integrated fieldbus configurators	Yes. Proprietary for CANopen, Profibus, ASi, DeviceNet and customer-specific devices	Yes, specific configurator for EtherCAT, CANopen, J1939, DeviceNet, PROFIBUS, Modbus (Master/Slave), PROFINET, sercos, EtherNet/IP, ASi, IO-Link. Additional generic configurator for customer-specific devices. Further fieldbuses in preparation. Device description in standard formats such as XML or in bus-specific format (GSD, EDS)
FDT support	-	Yes, as DTM frame application. CODESYS DTM application for CANopen available.
Available fieldbus protocol stacks as CODESYS library	CANopen	CANopen, EtherCAT, Sercos III, J1939. Ethernet/IP.
Configuration of fieldbuses with Hilscher netX connection	-	Yes, for PROFIBUS, PROFINET and Ethernet/IP
Search for fieldbus nodes (Device Scan)	-	Yes, for CANopen, EtherCAT, sercos, PROFINET, PROFIBUS and other fieldbuses
Fieldbus configuration without controller application	-	Yes, in online configuration mode
Configuration of the process image in the configurator	Yes. Creation of new global variables.	Yes. Creation of new global variables and user-friendly mapping to declared variables. Editing across fieldbuses possible.

4 Overview integrated Visualization Features

Functions	CODESYS V2.3	CODESYS V3
Graphical editor	Yes. Extendibility of the elements through DLL	Yes. Graphic elements implemented in IEC 61131-3 code, extendibility directly in CODESYS.
Supported graphical import formats	BMP, TIF, JPG, WMF	BMP, TIF, JPG, PNG, ICO, EMF, and SVG.
Visualization elements	Basic elements, very few complex elements	Growing number of modern visualization elements for application scenarios of different complexity. Style can be globally defined or modified using pre-defined visualization styles.
Unit conversion	Only via application.	With new data type “unit conversion” also applicable in PLC application.
SDK for the creation of additional visualization elements	Yes, based on DLLs. Additional development environment required.	Yes, creation directly in CODESYS. No additional development environment required.
User management for visualization	-	Freely configurable, with additional visualization elements for online management.
Tool bar for graphic elements	Yes, basic tool bar	Yes, comprehensive tool bar with submenus (docking view)
Definition of visualization styles	-	Yes, in a text file or with specialized style editor (included)
Parameterization of the visualization elements	In specific element dialog	With generic configuration dialog
Frames in visualization screens	-	Yes.
Modal windows	-	Yes.
Dependencies of elements	-	Yes.
Instantiability of visualization objects	Yes, using place holders.	Yes, using parameter interface.
Visualization function blocks in libraries	Yes.	Yes, appearance can be modified using styles.
Available clients	CODESYS HMI, CODESYS WebVisu, CODESYS Target Visu	CODESYS HMI, CODESYS WebVisu, CODESYS Target Visu. Additional runtime for non-programmable devices and remote terminals, variable management via data server.
PC client	CODESYS HMI requires CODESYS project in source code Only for Windows	CODESYS HMI, can be generated from within the project. No source code required on HMI device. Based on standard runtime system and executable under Windows, Windows CE, Linux.
Client in WebBrowser	Yes, using a JAVA applet. Only executable on devices with supported JAVA runtime	Yes, using HTML5. Executable on all HTML5 browsers, such as tablet computers or smart phones.

Functions	CODESYS V2.3	CODESYS V3
Client on controller	Yes.	Yes. Also as client with remote visualization panel. Required runtime system scalable, also suitable for compact PLCs without operating system.
Visualization of several controllers	Through data collection on main controller for example on the basis of network variables	Yes, using the CODESYS DataServer: Collects data from different devices on main controller, handles data log and alarms. Display of collected data in one visualization possible. The CODESYS DataServer can be utilized on different platforms with sufficient performance.

5 Overview Motion + CNC Features

Functions	CODESYS V2.3	CODESYS V3
Integrated CNC editor	Yes. Implementation for 2.5 D movements	Yes, full-fledged graphical and textual 3D editor.
Integrated CAM editor with graphical and numerical input	Yes, display of velocity and acceleration	Yes, display of velocity, acceleration and jolt.
PLCopen Motion POUs	Implemented and certified	Implemented and certified
Interpolator	Yes.	Yes.
Available geometric transformations	Yes.	Yes, numerous new transformations with extended functionality.
Visualization templates for motion POUs	Yes.	Yes, appearance can be modified using visualization styles.
Online editing of CAMs	-	Yes, using a special visualization element
Online editing of CNC paths	-	Yes, using a special visualization element
Simplified command model for DS402 compatible drives	-	Yes, as SoftMotion Light for uncoordinated, regulated drives.

6 Overview Safety Features

Functions	CODESYS V2.3	CODESYS V3
Certified usage for applications according to IEC 61508 SIL2	Yes, but certificate is no longer valid for new controllers.	Yes. Certified suitability of the CODESYS Development System and the CODESYS Control Runtime System for SIL2 applications. SDK with integration manual, user manual and certification concept.
Certified usage for applications according to IEC 61508 SIL3	Yes, but certificate is no longer valid for new controllers.	Yes. Integrated add-on product CODESYS Safety with certified suitability for SIL3 applications available. SDK with integration manual, user manual and certification concept.

Functions	CODESYS V2.3	CODESYS V3
Support safe fieldbus systems	Customer-specific implementation possible	Yes. Safe layer for FSoE (EtherCAT Safety) and PROFISAFE based on existing fieldbus configurators, certified for SIL3 applications. CANopen Safety for SIL2 applications.
Support of available EtherCAT safety clamps	-	Yes, add-on product for the implementation of the EtherCAT safety clamp EL6900 in a CODESYS setup, consiting of a standard controller (non-safety) with CODESYS EtherCAT support.

Change History

Version	Description	Author	Date
1.0	created	RW	25.06.2013
1.1	translation of German update	StK	19.02.2014