CODESYS Virtual Safe Control SL

Safety without compromise: With CODESYS Virtual Safe Control SL, you get a certified SIL3 controller without any special hardware requirements. Install it on your commercial-off-the-shelf hardware and experience maximum safety - only with CODESYS.

Its safety functionality is based on the certified component CODESYS Safe Control Core - safety manual and certificate of the core apply to this product.

Technical description

Product	*Virtual safe control system certified to ISO 61508 SIL3, purely in software, based on coded processing technology; safety functionality provided by the component CODESYS Safe Control Core*
Safe Control Core version	V4.3.0.0
Delivery form	Container image based on OSADL Base Image
Licensing	Application-based licensing for safe control systems
Maximum size application code	1 MB
Maximum size of application data	1 MB
Demo/test mode	2 hours
Certificates	
ISO 61508 SIL3 certificate	Product certificate issued by TÜV Süd
Safety-related information	
PFH value	$1 * 10^{-10}$
Calculation of safety response time	2 * watchdog time + 2 * safety task cycle time
Resources required	
CPU architecture	x86-64, ARM64
CPU	min. 1.5GHz, max. 15GHz CPU frequency
MultiCore CPU	no restriction
Memory protection/ memory test	no requirements
Communication for standard control	Shared memory

Functions	
POU types	PRG, FB, GVL
PLCopen Safety Basic Level	Yes
PLCopen Safety Extended Level	Yes
PLCopen Safety System Level	No
PLCopen Safety FBs	Yes, version 1.0, except for SafeStop1, SafeStop2 and SafelyLimitedSpeed
IEC 61131 standard library	Yes
Data types	BOOL, BYTE, DINT, DWORD, INT, SAFEBOOL, SAFEBYTE, SAFEDINT, SAFEDWORD, SAFEINT, SAFETIME, SAFEWORD, TIME, WORD
REAL/LREAL data types	No support
Minimum configurable cycle time	1 ms
Number of IEC tasks	1
Number of POUs allowed	Not restricted
Limitation of program complexity	configurable
User management	Yes
Retain data	No support
Qualified monitoring	Yes
Breakpoints	No
Write/Force	Yes
Application Pinning	Yes
Device logbook	Yes
Application logbook	Yes
Safe network variables	No
Standard exchange variables	Yes
Communication in system error	Yes
GIT support	No
Project documentation	Yes

Diagnostic interfaces	SafeControlServices.library
Extension interfaces	None
Field buses	
None	
Safety protocols	
Profisafe Host V2.4	Yes
Profisafe Host V2.6	Yes
Profisafe Device V2.6	No
FSoE Master	Yes
FSoE Slave	No
CIP Safety Originator	No
CIP Safety Target	No
CANopen Safety Master	No
CANopen Safety Slave	No
J1939 Safety	No

Performance

Execution time of the safe IEC application:

Connections + 100 FBs	*Intel i7 10th gen, 3.6 GHz@4 cores, 64 bit*	*Raspberry Pi 5, 64 bit*
4 (Safe XS)	0.3 ms	0.4 ms
8 (Safe S)	0.3 ms	0.5 ms
16 (Safe M)	0.4 ms	0.6 ms
64 (Safe L)	0.9 ms	1.4 ms
192 (Safe XL)	2.3 ms	3.2 ms

General information

Supplier:

CODESYS GmbH
Memminger Strasse 151
87439 Kempten
Germany

Support:

Technical support is not included with this product. To receive technical support, please purchase a CODESYS Support Ticket.

https://support.codesys.com

Item:

CODESYS Virtual Safe Control SL

Item number:

000139

Sales/Source of supply:

CODESYS Store
https://store.codesys.com

Included in delivery:

CODESYS AddOn package which comprises:

- CODESYS Virtual Safe PLC as container image in tar.gz format
- Safe time provider as container image in tar.gz format
- Script files to manage the Virtual Safe PLC
- CODESYS Device description for Virtual Safe PLC
- CODESYS EULA in German and English
- OSS license information
- Release notes
- Safety Manual

System requirements and restrictions

Programming system	• CODESYS Development System V3.5.20.0 or higher • CODESYS Safety Extension AddOn V4.3.0.0 or higher
Runtime system	CODESYS Virtual Control SL V4.14.0.0 or higher
Supported platforms	Debian Linux, RedHat Enterprise Linux, Yocto Linux (x86-64, ARM64)
Additional requirements	• Support of a container engine required (Docker/Podman) • Virtual Control SL to run PROFINET and/or EtherCAT communication

	• Second independend time source • Optimisation of Linux version for real-time (RT_preempt patch)
Limitations	• When using the CODESYS Virtual Safe Control SL, the information in the associated Release Information Document must be observed! • When using the CODESYS Virtual Safe Control SL, the workarounds in the CODESYS Safe Control Core Errata List must be taken into account.
Licensing	 Application-based network license: The runtime system is licensed via application-based licenses that are provided by a license server. The number of licenses determines how many controllers can be supplied at the same time. The license server can be operated in the local network or locally on the same device on which the controllers to be licensed are running. Note: Without a license, each controller runs in demo mode for two hours.
Required accessories	None

Note: Technical specifications are subject to change. Errors and omissions excepted. The content of the current online version of this document applies.

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