Safety med controller og drives

SIMATIC og SINAMICS Safety Integrated

- tips, tricks og seje tools



Dagens værter

Ole Dyval, Technology Specialist Anders Gad, Technology Specialist

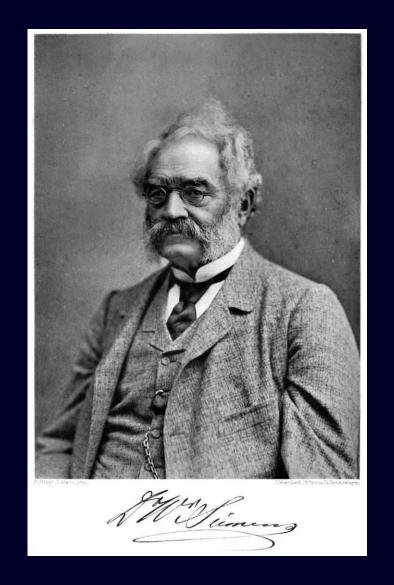


Agenda

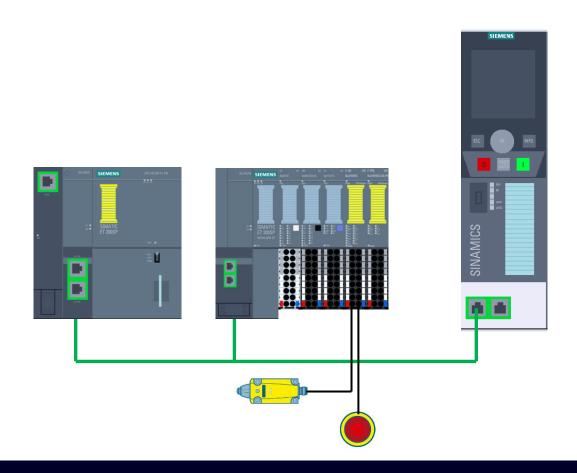
- Planning with TIA Selection Tool
- IO-test with PRONETA
- Download with SIMATIC Automation Tool
- SINAMICS Integrated Safety
- PROFISAFE LDrvSafe Library
- Commissioning via Startdrive
- SINAMICS Serial Drive Commissioner
- WEB Diagnostics
- Fast Commissioning with TIA Portal
- Acceptance test and Safety Activation test

Werner von Siemens, Berlin 1880

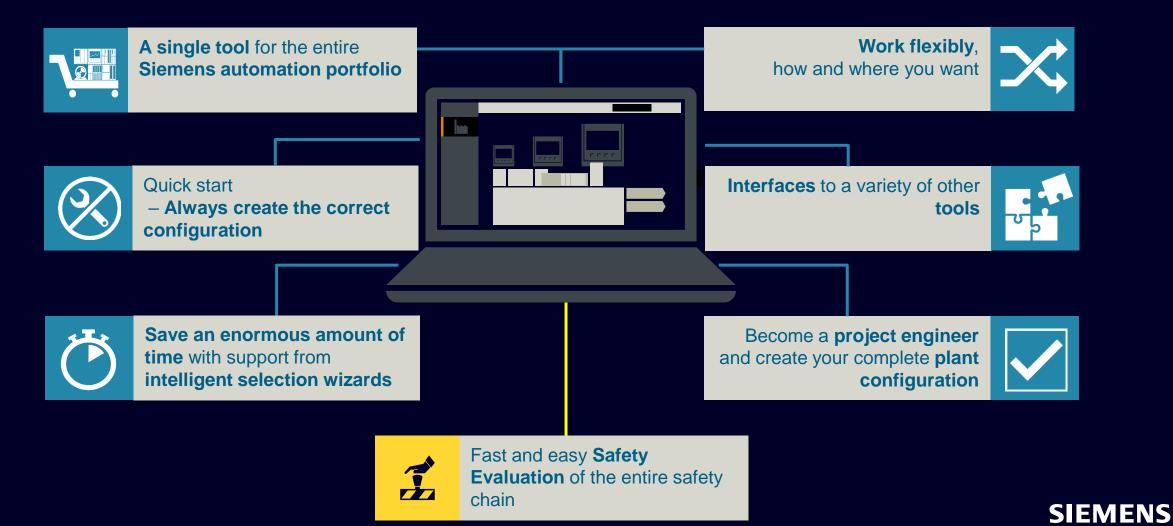
"The prevention of accidents must not be understood as a legal requirement, but as a precept of human duty and economic reason."

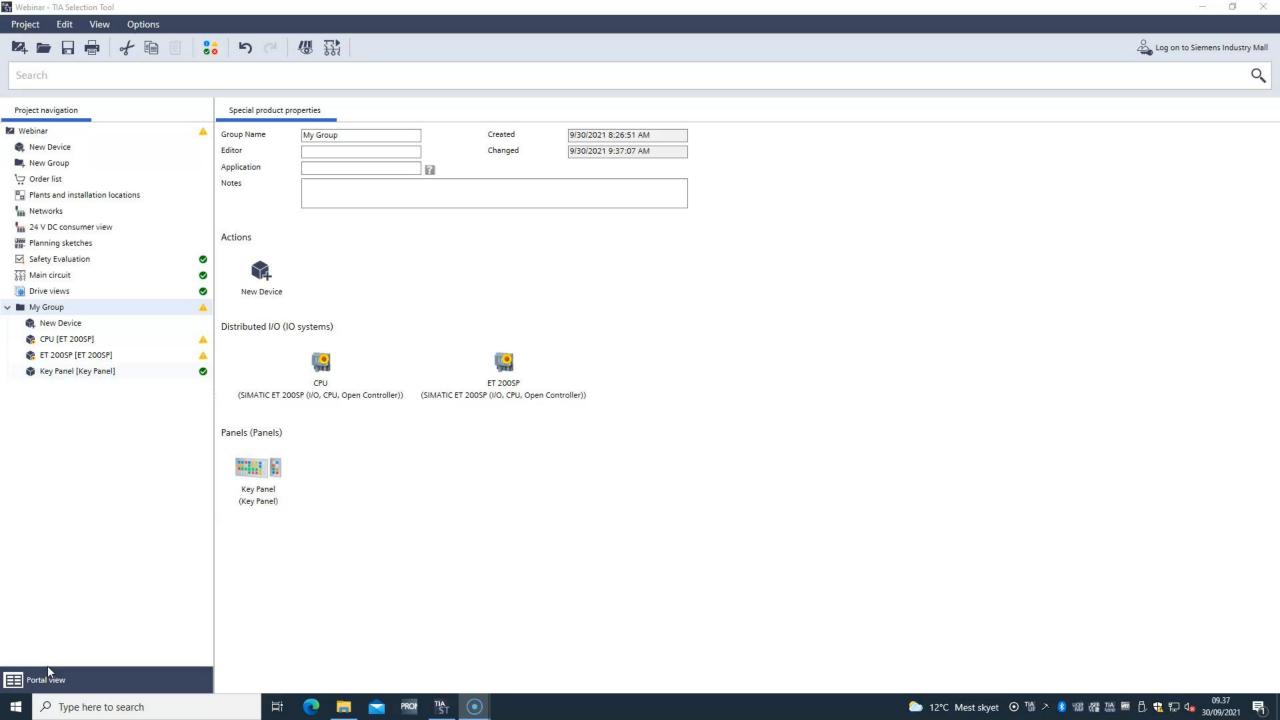


Testopstilling

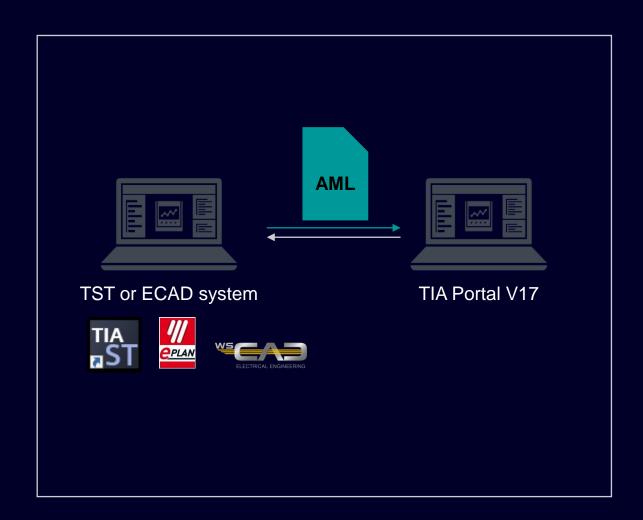


Planning with TIA Selection Tool





TIA Selection Tool to TIA Portal via AML



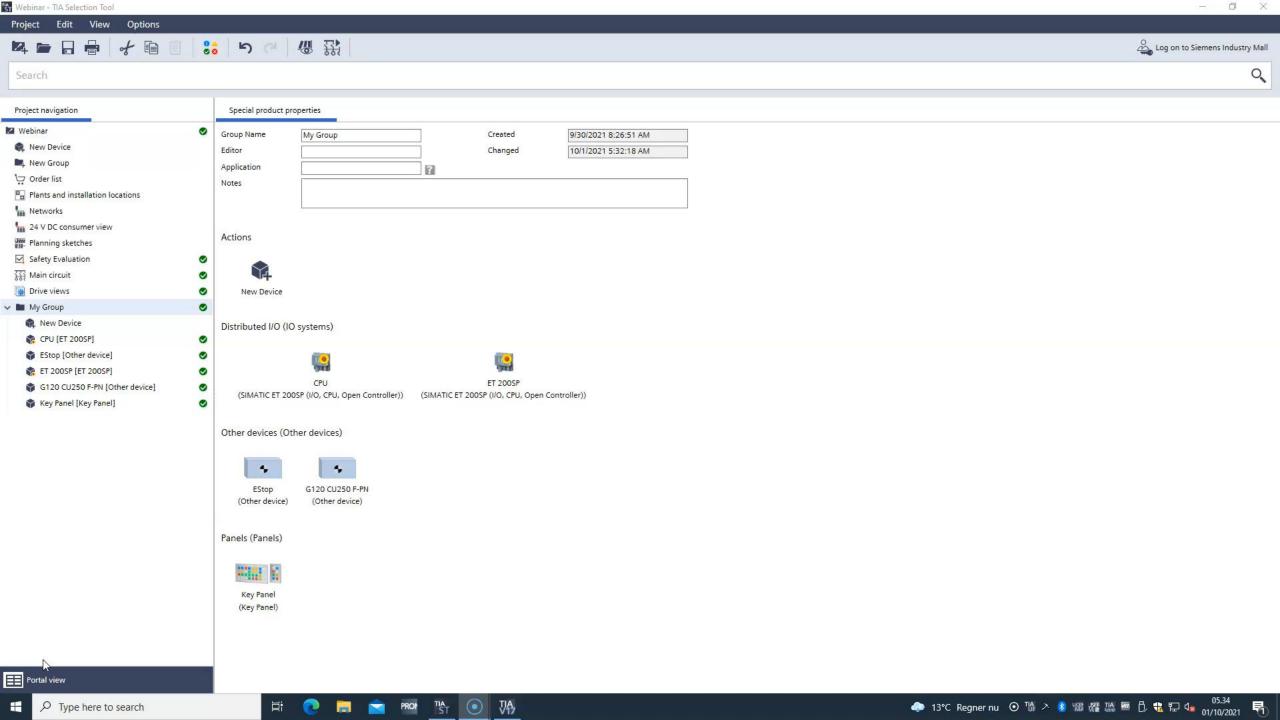
Extension of the CAx export and import

- Supports AML specification AR APC v1.2
- Supports Safety Base Units for ET 200SP modules
- Exchange of manufacturer-specific hardware parameters for GSD/GSDML-based device
- Option to export normalized article numbers
- Tolerant import of article numbers

Benefits

Increased flexibility for preventing incompatibilities during data exchange between TST/ECAD system and the TIA Portal.

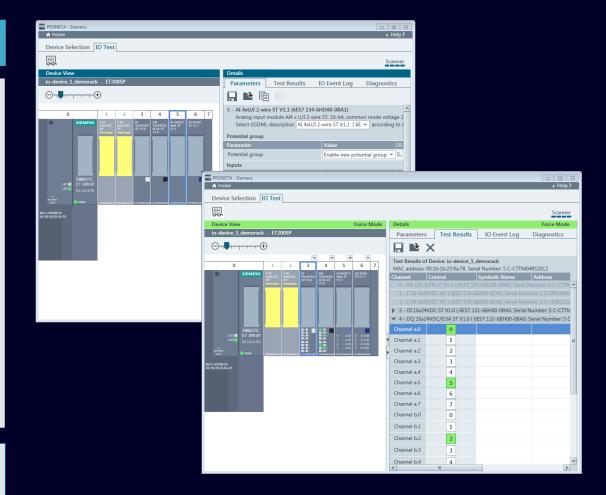
Thanks to the extensions, relevant data remains within the tool chain and increases efficiency on account of there being less manual reconfiguration

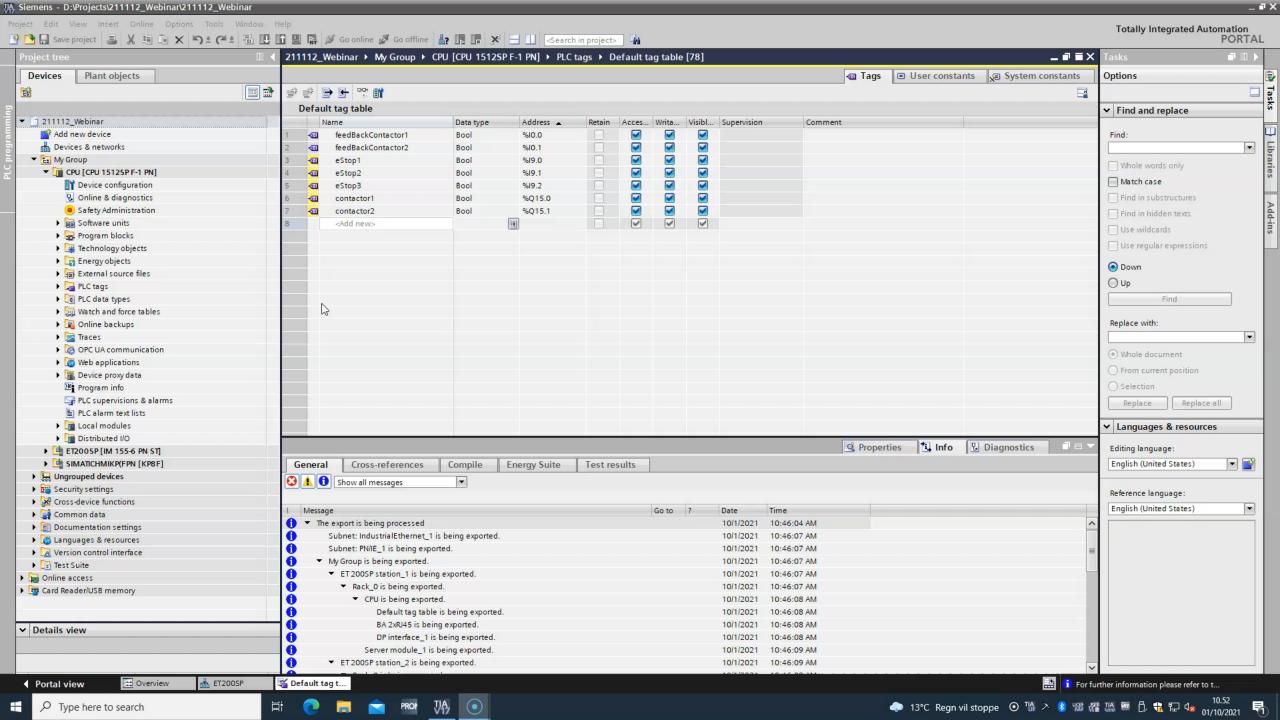


PRONETA IO-test for F-modules

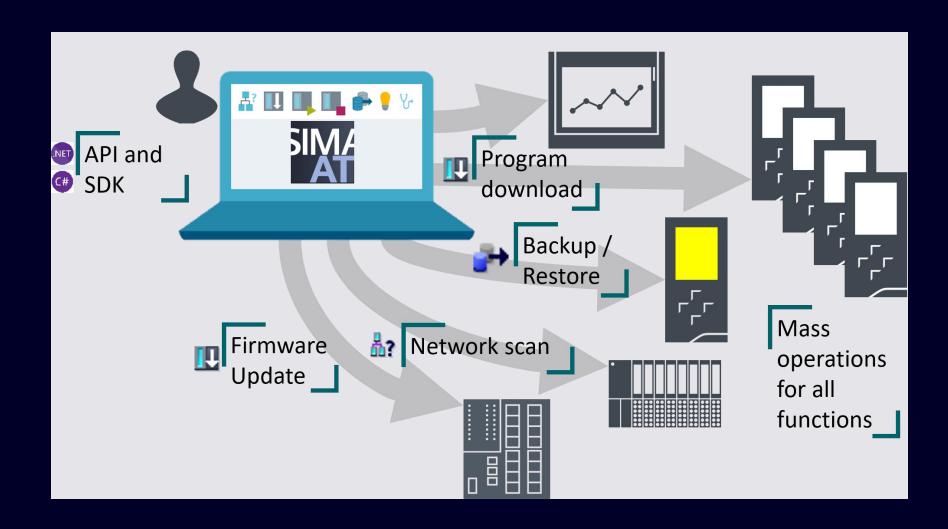
Functions

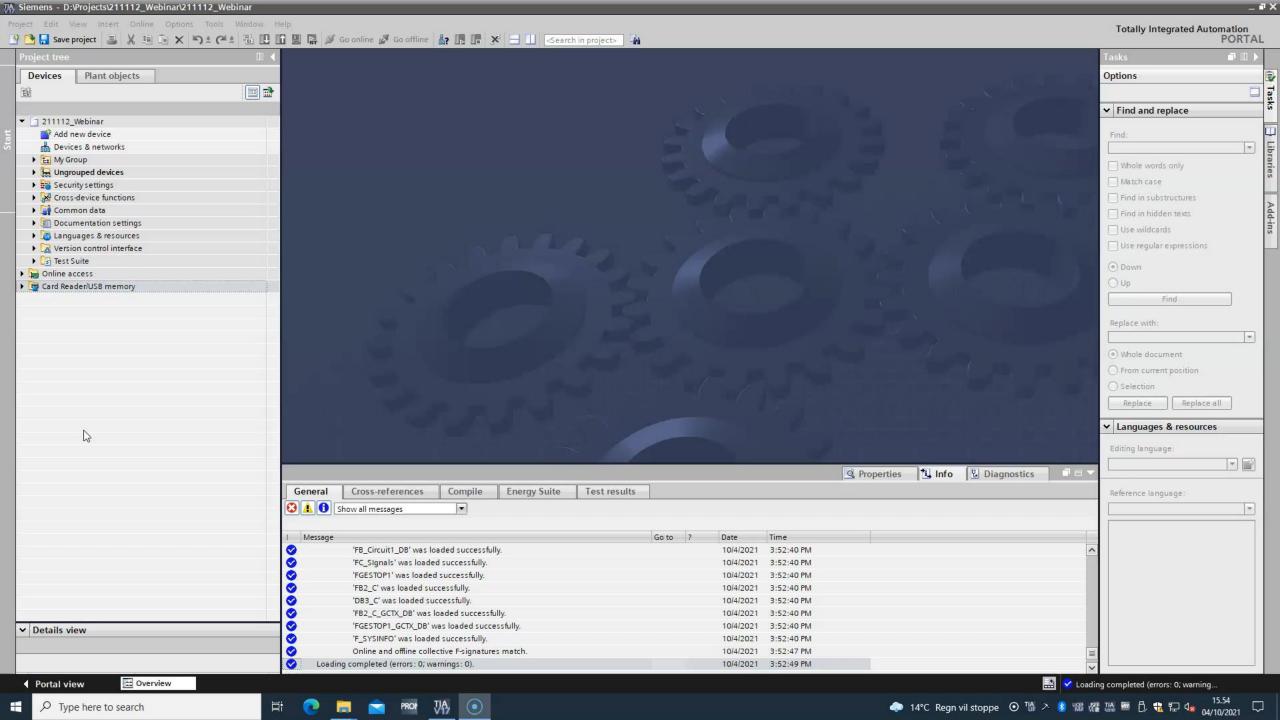
- Read and compare module configuration (module type, serial number, firmware version and more)
- Writing module parameters
- Read and write IO-signals
- Read and write IO-signals for F-modules
- Automatically logging of IO-signal changes
- Display device-specific diagnostics
- Create and export IO-check protocol
- No CPU, engineering software or special hardware required





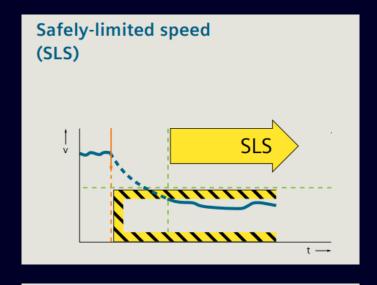
Download with SIMATIC Automation Tool

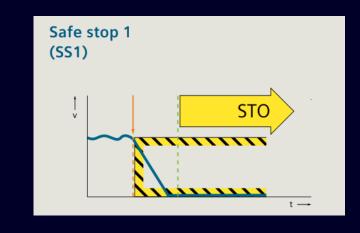




SINAMICS Integrated Safety - Funktionaliteter





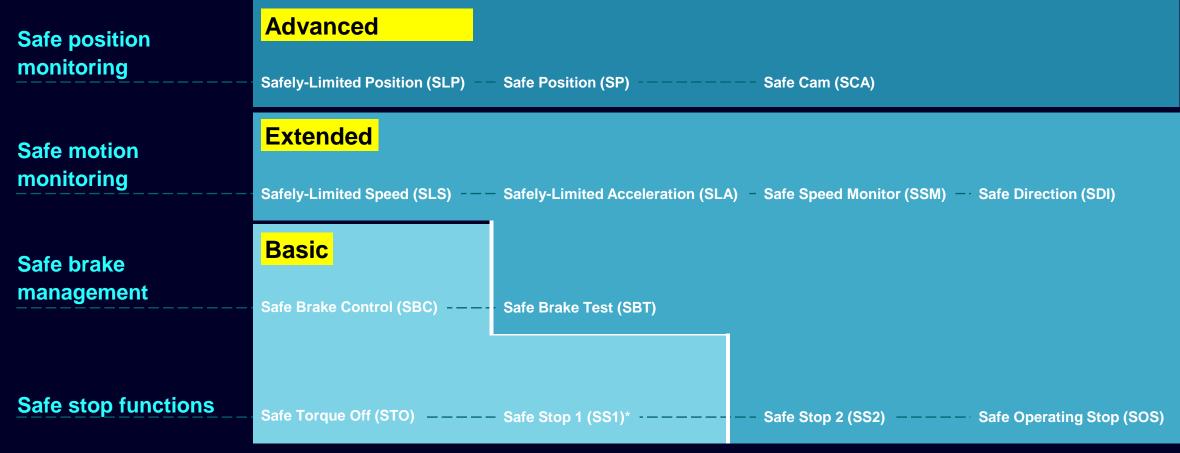


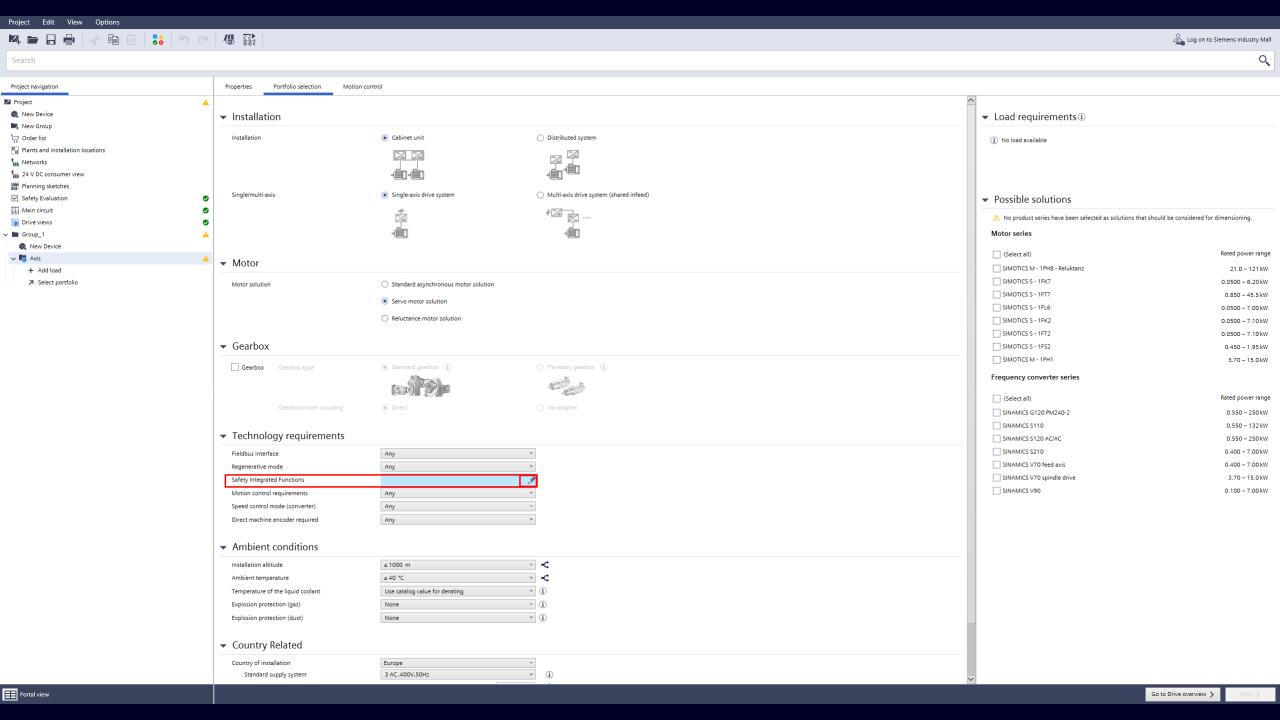


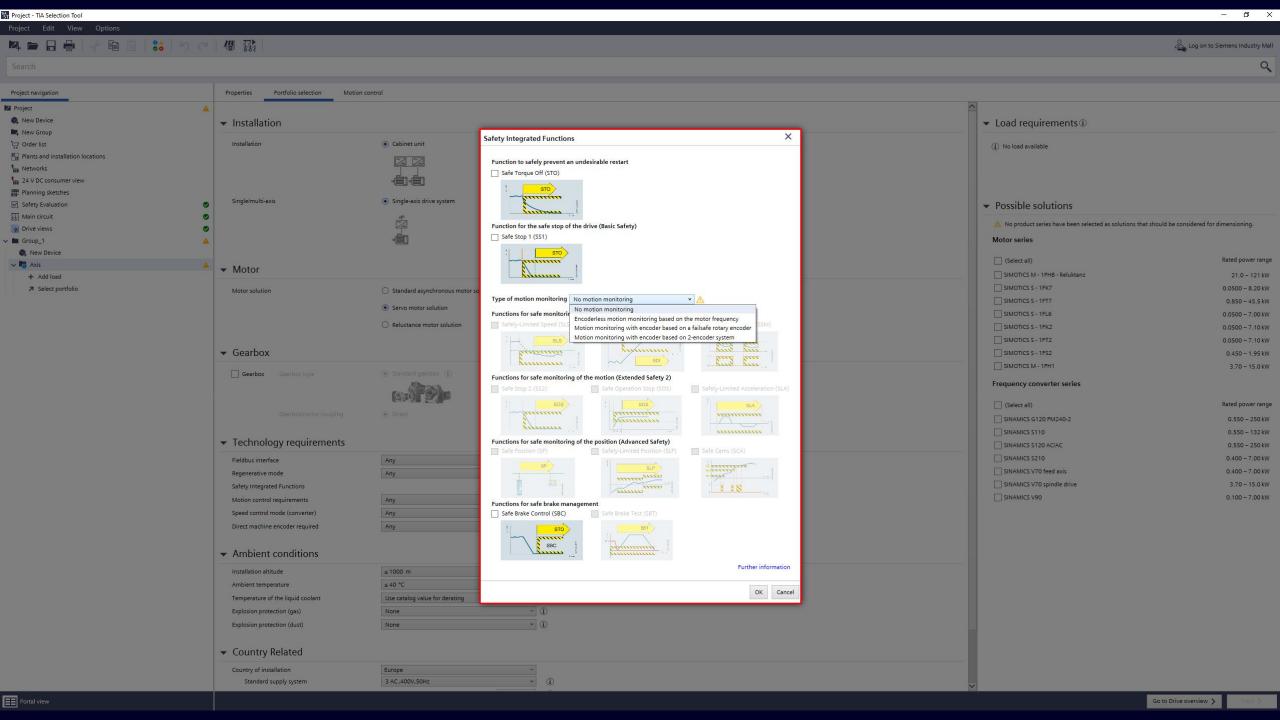




SINAMICS Integrated Safety - Funktionaliteter



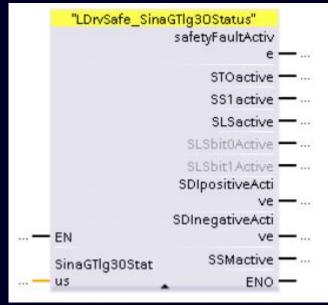


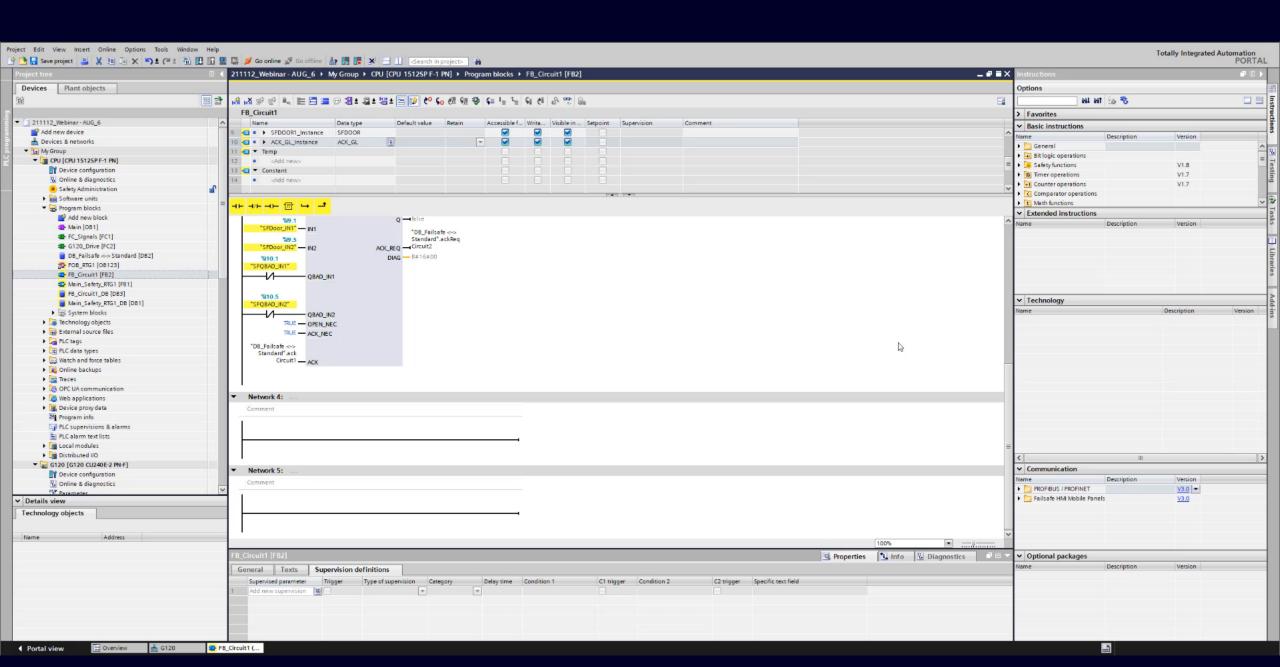


SINAMICS Safety Integrated - Control via PROFIsafe LDrvSafe library

- Separate control and status blocks for each PROFIsafe telegram (30, 31, 900, 901, 902, 903)
- Deselection (high signal) of each safety function per default
- Structure of the PROFIsafe telegrams mapped to failsafe userdefined data types (F-UDT)
- Users do not have to know the structure of the PROFIsafe telegrams
- https://support.industry.siemens.com/cs/dk/en/view/109485794

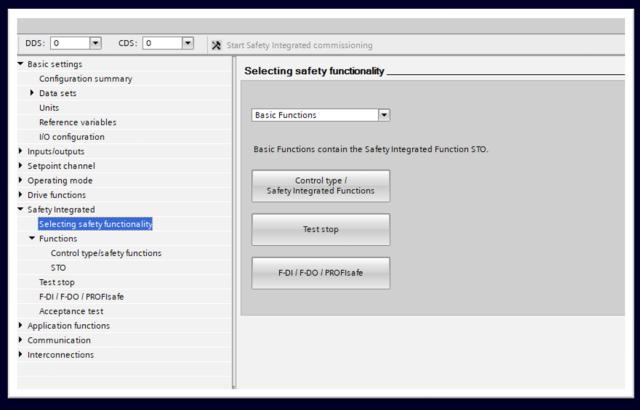






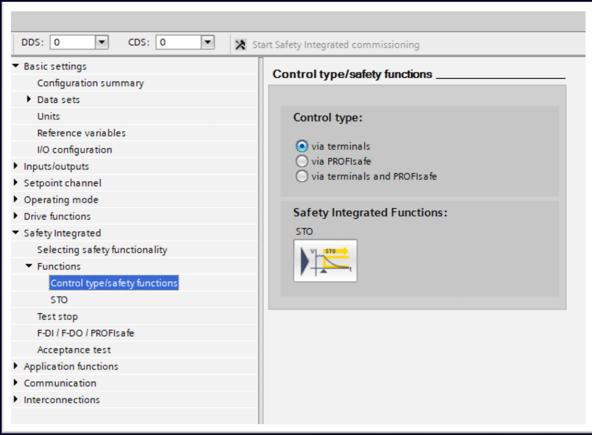
SINAMICS Safety Integrated – Opsætning i drevet

- Basic eller Extended?
- PROFIsafe eller I/O?
- Test stop
 - Interval / indstilling?
 - Hvorfor?
 - Og er det vigtigt?
- Efter download.....
 - Acceptance test required (....)
 - F01650 Processor 1
 - F30650 Processor 2
 - Error (1000)
 - Error (2003)
 - Copy Ram to Rom
 - Upload



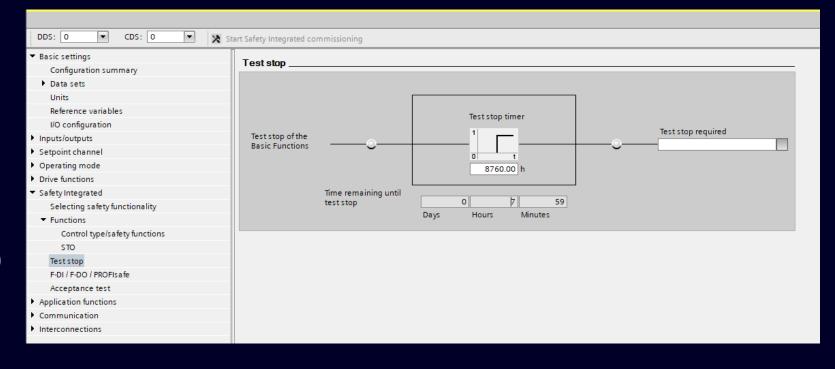
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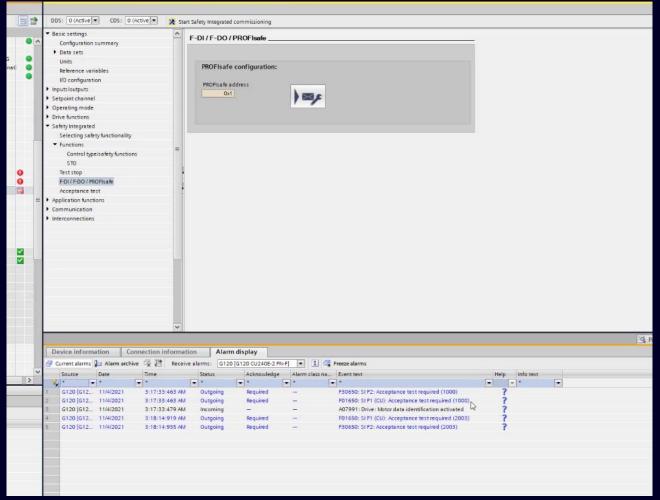
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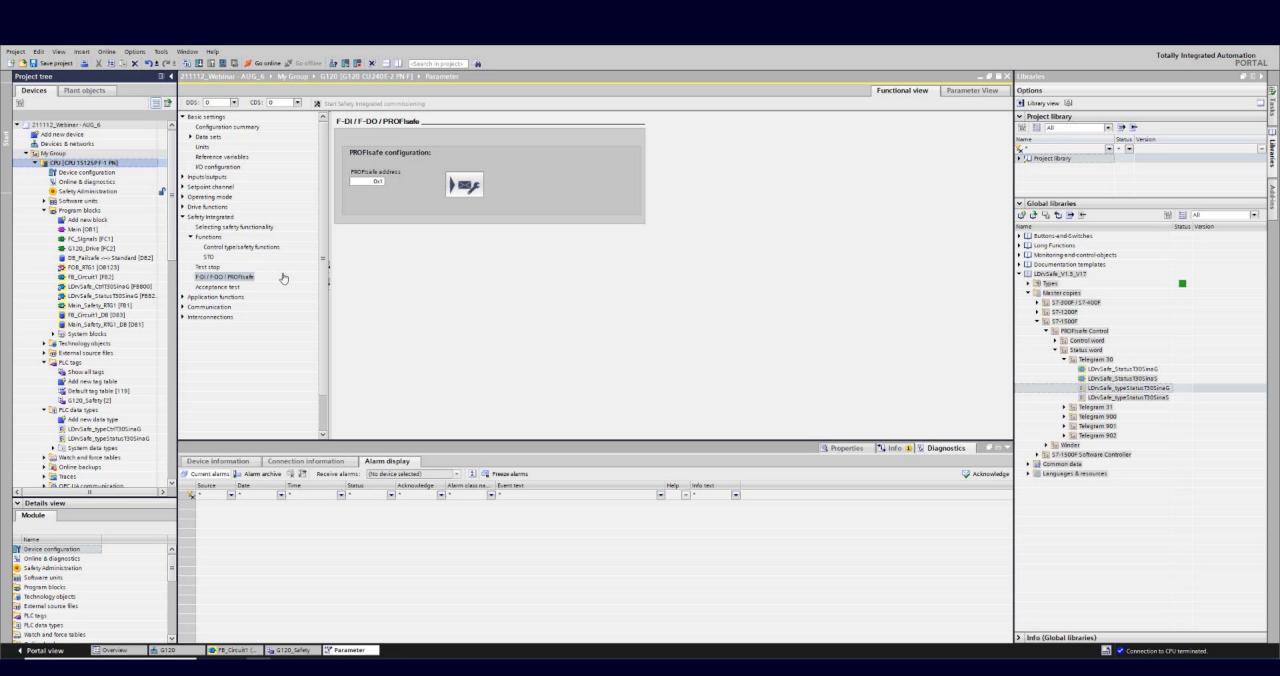


SINAMICS Safety Integrated –

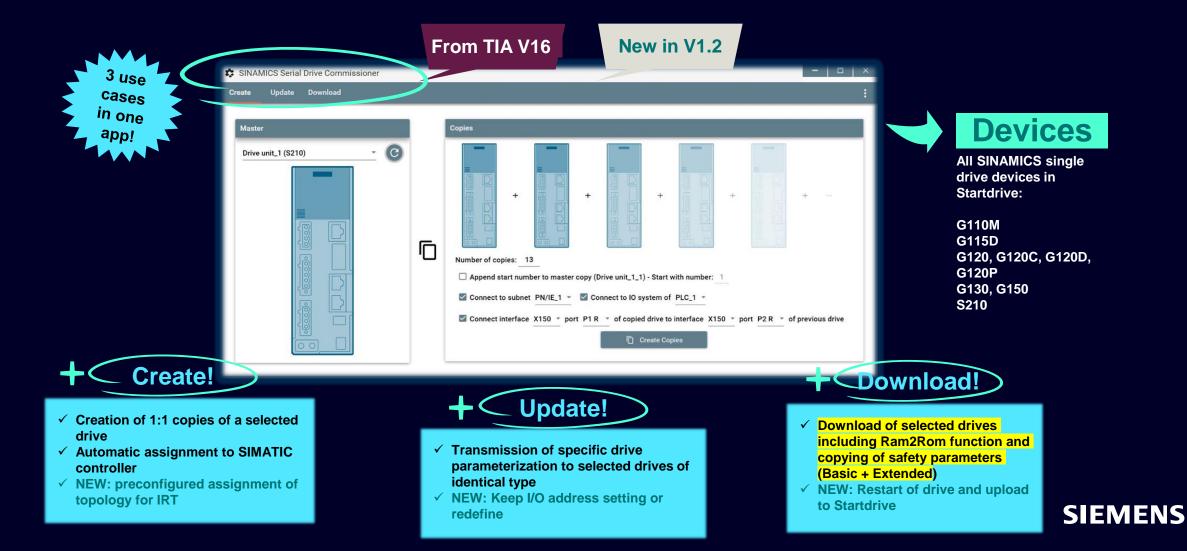
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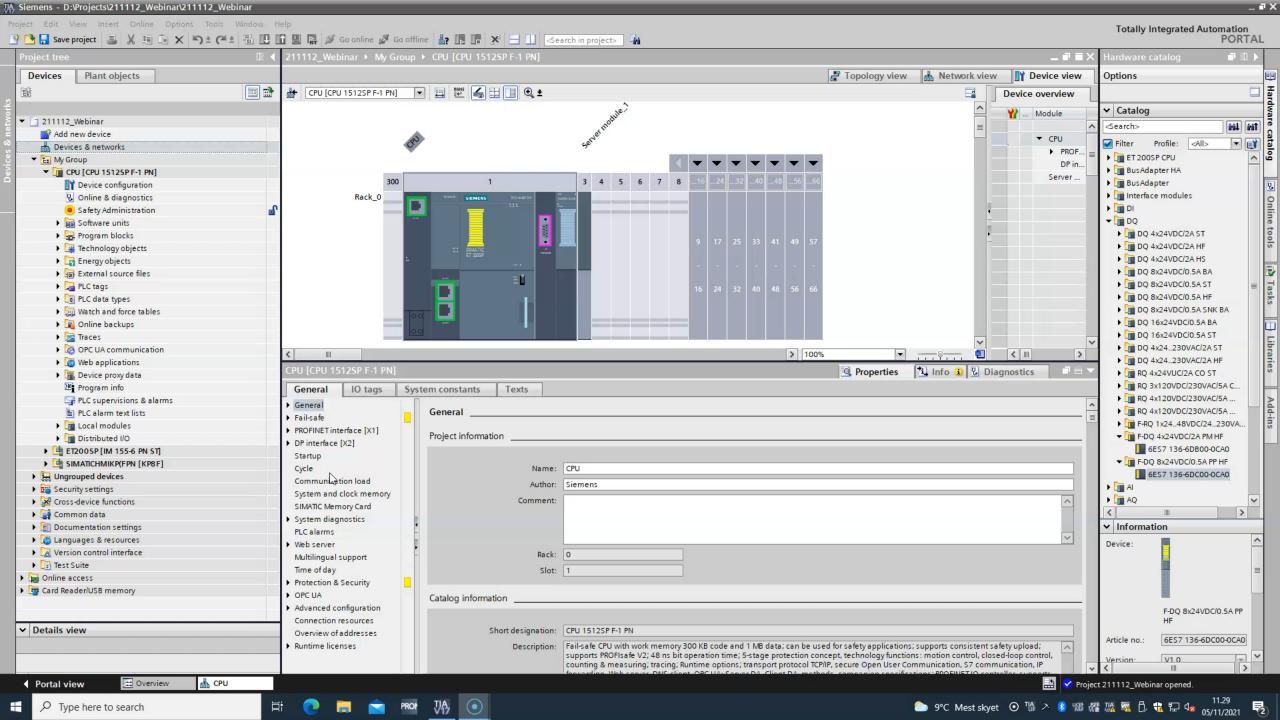


SINAMICS Integrated Safety – SINAMICS Serial Drive Commissioner

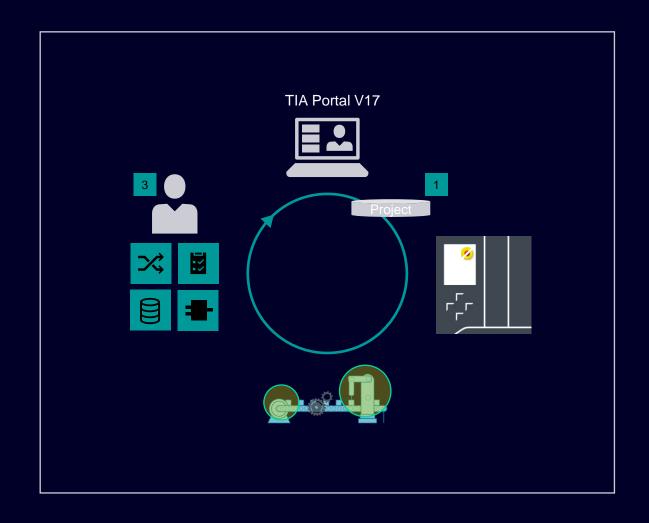


WEB diagnostics





Safety V17 Fast Commissioning

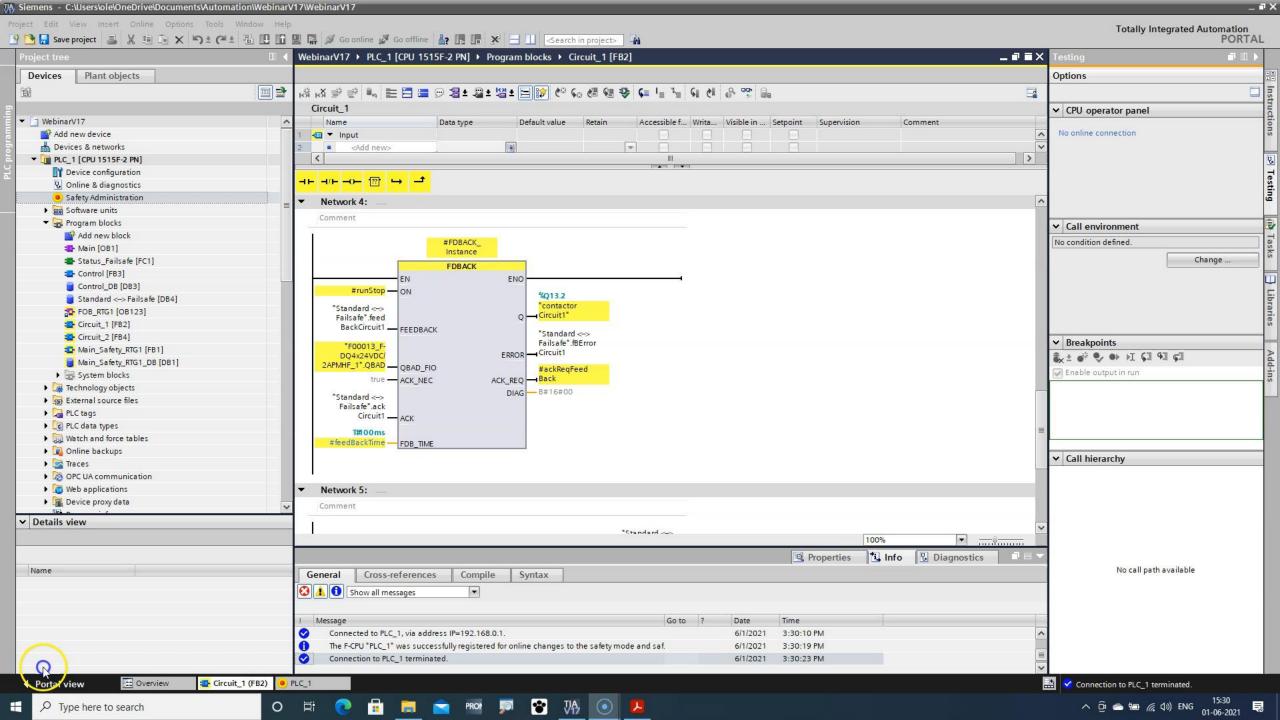


Fast Commissioning workflow

- 1. Download prepared project to controller.
- Deactivate Safety mode and activate Fast Commissioning mode
- 3. Perform adjustments in safety program during operation
- 4. Finalize project by full compile
- 5. Final download of the safety program
- Activation of Safety mode and re-initialization by STOP – START transition of CPU

Benefits

- Increased efficiency when commissioning the safety program
- Shorter compile times during commissioning
- Adjustments of safety program during deactivated safety mode
- More control due to time limitation of deactivated Safety mode



SINAMICS Integrated Safety - New Safety Activation Test Difference between Acceptance Test and Activation Test

Safety Acceptance Test (existing since V15)

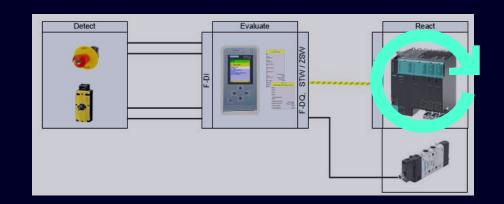
Validation of correct safety parameterization for the integrated drive safety functions. Clearance about questions such as:

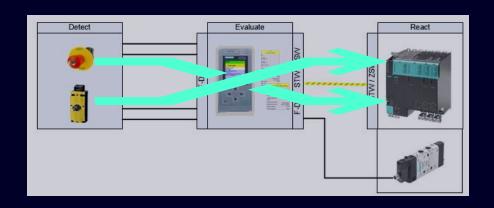
- Are the braking ramps set correctly?
- Are the limitations and fault reactions set correctly?
- · ...

Safety Activation Test (NEW in V17)

Validation of the safety control chain from sensor to actuator. Clearance about questions such as:

- Does every drive select the correct safety function when a safety sensor is activated?
- Are all safety functions realized according to the risk minimization?
- Are there wiring errors for the safety sensors?
- ...





SINAMICS Integrated Safety - New Safety Activation Test Difference between Acceptance Test and Activation Test

Safety Acceptance Test (existing

Validation of correct safety paraisafety functions. Clearance about

- Are the braking ramps s
- Are the limitations and f
- · ..

Safety Activation Test (NEW ir

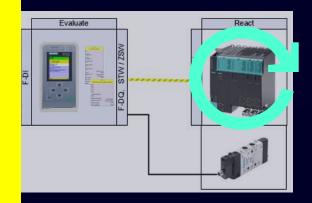
Validation of the safety control c about questions such as:

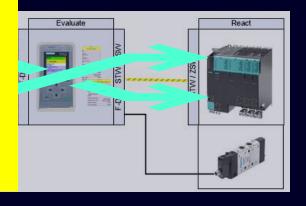
- Does every drive select sensor is activated?
- Are all safety functions minimization?

Hvorfor acceptancetest?

- CE mærkning?
- DS/EN 13849-1
- DS/EN 13849-2, kapitel 8
- DS/EN 62061, kapitel 8

Validering og dokumentering





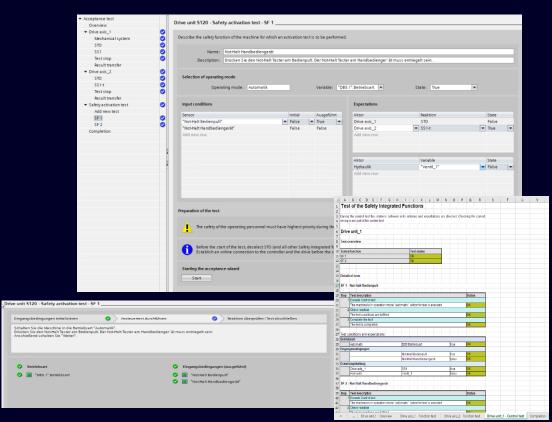
• Are there wiring errors for the safety sensors?

SINAMICS Integrated Safety - New Safety Activation Test

Workflow & required license

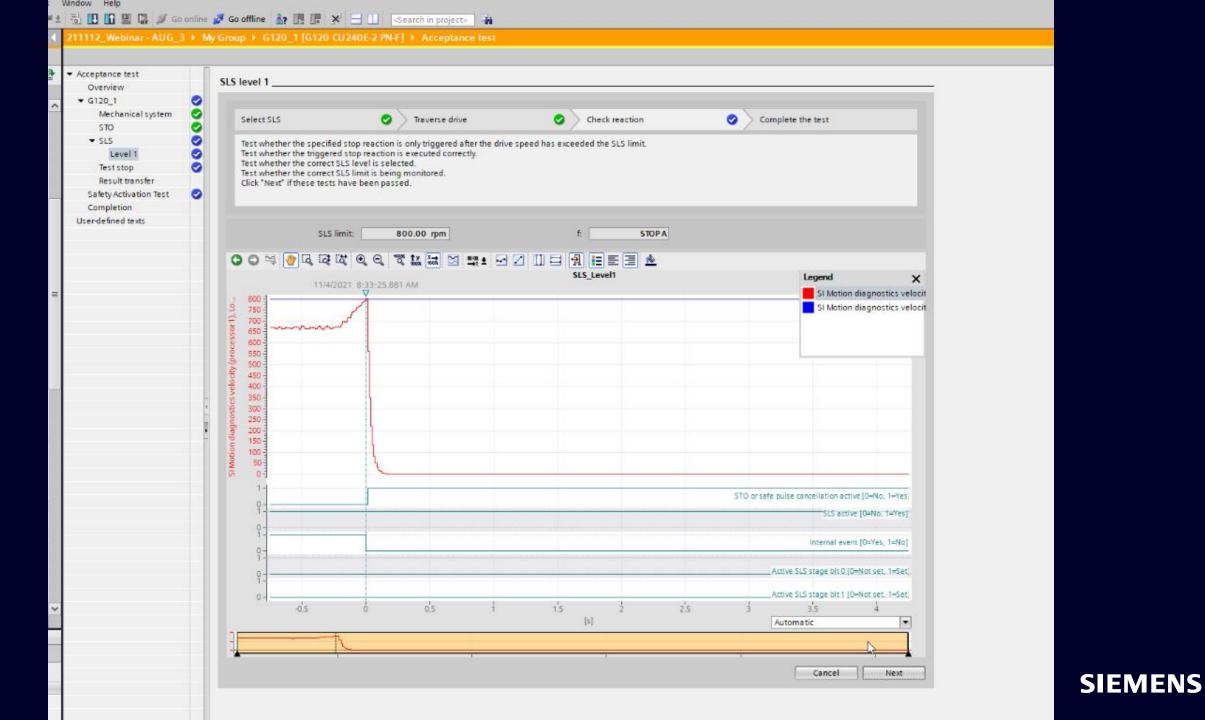
Workflow

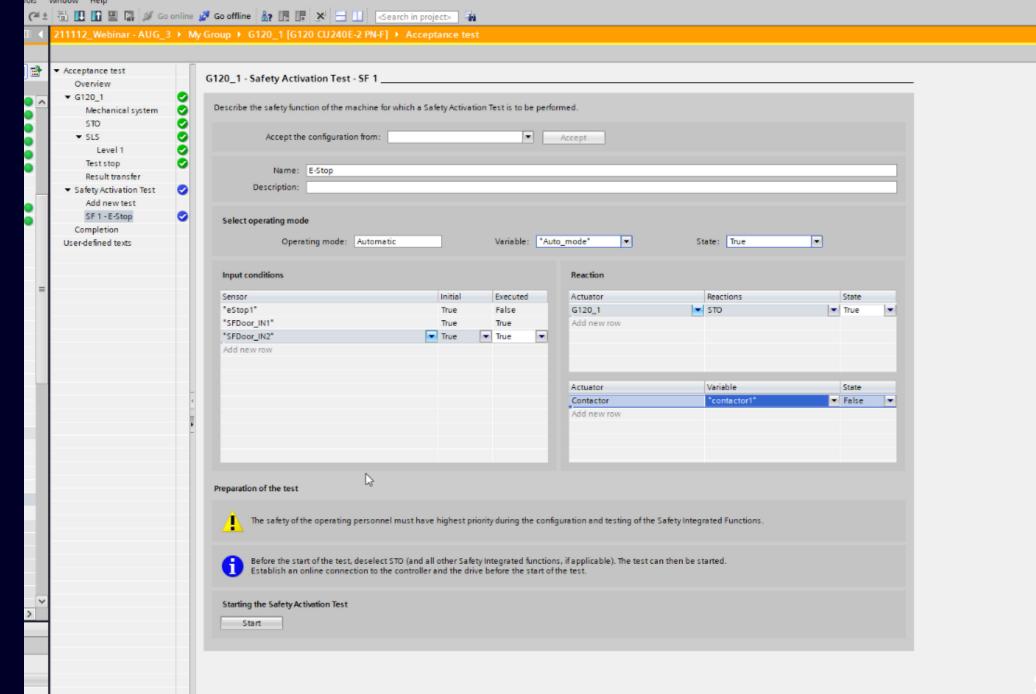
- Define all safety functions via the wizard: operation mode, input conditions, expected reaction (this step can be done by the project engineer already in advance to the commissioning phase)
- After machine commissioning execute the tests and go through all defined safety functions using the guided step by step assistant
- Automatic creation of the test protocol with all necessary information

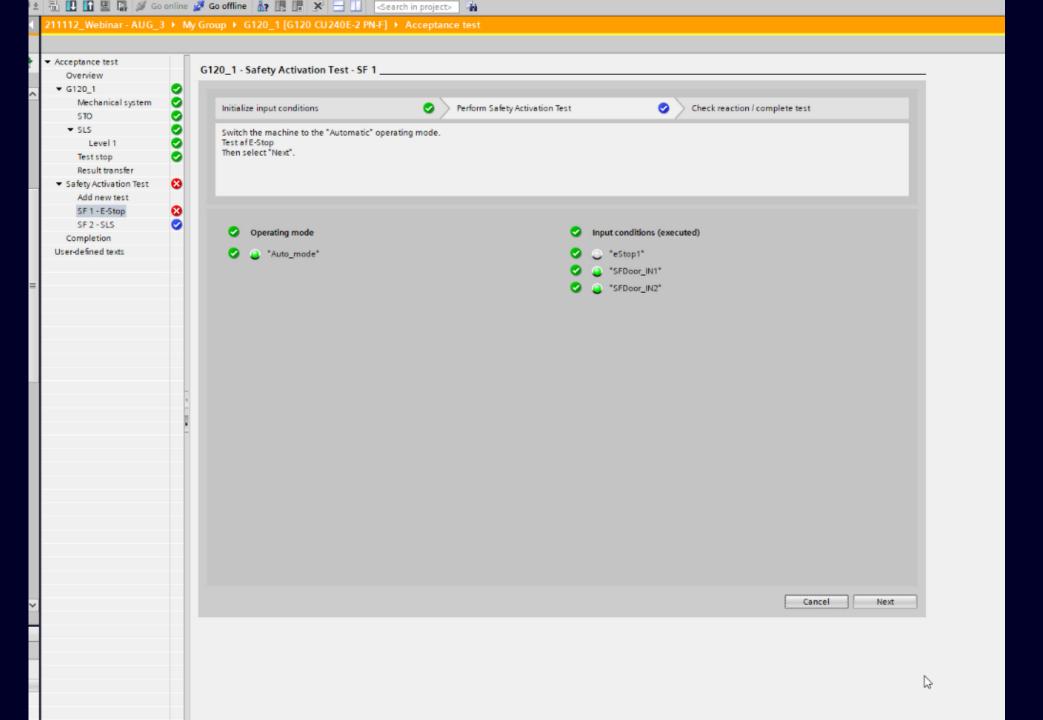




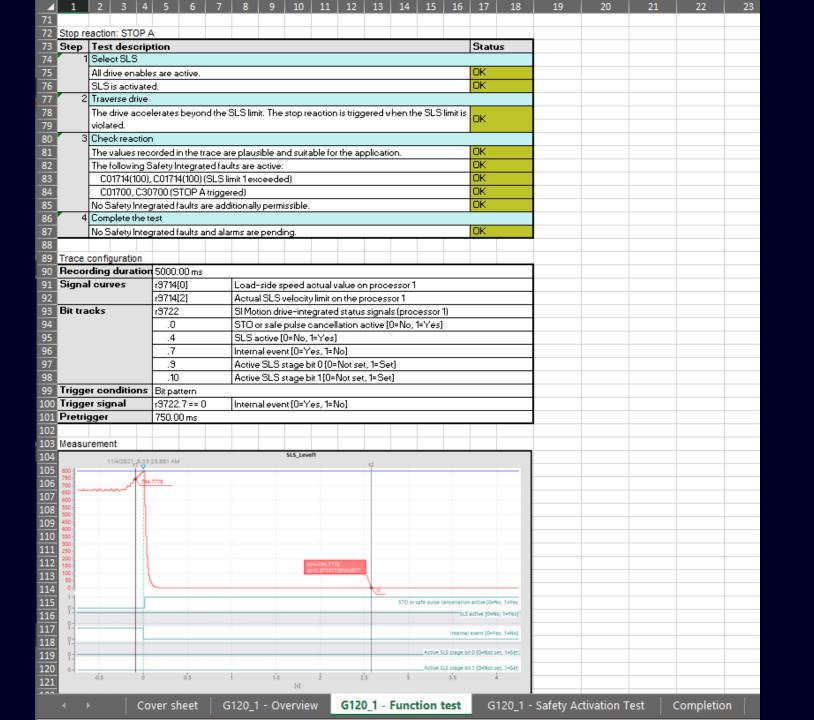
Safety Activation Test is part of the Safety Acceptance Test and thus also part of the SINAMICS Startdrive Advanced license.







1	Param. no r9781[0] r9781[1] r9782[0] r9782[1]	Value 65BF5FFBH 86A88D1BH 63.3375 h 63.3375 h					
12 Name 13 SI checksum to track functional changes 14 SI checksum to track hardware-specific changes 15 SI time stamp for checksum to track functional changes 16 SI time stamp for checksum to track hardware-specific changes 17 18 Firmware version	r9781[0] r9781[1] r9782[0]	65BF5FFBH 86A88D1BH 63.3375 h					
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21 Control Unit firmware version	r18	4715213					
22 SI Motion version safety motion monitoring (processor 1)	r9590[03]	4.71.39.0					
23 SI version drive-integrated safety function (processor 1)	r9770[03]		1				
24	10110[00]						
Drive G120_1							
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Firmware version							
28							
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Control Unit firmware version	r18	4715213					
SI Motion version safety motion monitoring (processor 1)	r9590[03]						
SI version drive-integrated safety function (processor 1)	r9770[03]	4.71.39.0					
33							
34 Safety Integrated motion monitoring cycle							
35							
Name	Param.no	. Value					
37 Sl monitoring clock cycle (processor 1)	r9780	2.00 ms					
38							
Parameterization of the Safety Integrated Functions							
40							
11 Extended Functions							
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Name	Param.no	Value	1				
44 SI Motion reference checksum SI parameters (processor 2), Checksum over SI							
parameters for motion monitoring	p9399[0]	27C9830FH					
46 SI Motion reference checksum SI parameters (processor 2), Checksum over SI	000000	opoposes:					
7 parameters with hardware reference	p9399[1]	2BCD926FH					
8 SI Motion enable safety functions (processor 1)	p9501	00000001H					
9 SI Motion function specification (processor 1)	p9506	ħ					
50 SI Motion function configuration (processor 1)	p9507	00000003H					
51 SI Motion behavior during pulse cancellation (processor 1)	p9509	000000FFH					
2 SI Motion gearbox motor/load denominator (processor 1), Gearbox 1	p9521[0]	2780					
3 SI Motion gearbox motor/load denominator (processor 1), Gearbox 2	p9521[1]	1					
54 SI Motion gearbox motor/load denominator (processor 1), Gearbox 3	p9521[2]	1					
55 SI Motion gearbox motor/load denominator (processor 1), Gearbox 4	p9521[3]	1					
56 SI Motion gearbox motor/load denominator (processor 1), Gearbox 5	p9521[4]	1					
57 SI Motion gearbox motor/load denominator (processor 1), Gearbox 6	p9521[5]	1					
8 SI Motion gearbox motor/load denominator (processor 1), Gearbox 7	p9521[6]	1					
Cover sheet G120_1 - Overview G120_1 G120_1	- Function to	est G120_1	- Safety A	tivation T	est	Completic	n



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30			The initialization is completed. Perform Safety Activation Test																	-				-
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35	4		Complete the test The test is completed.																					-
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Anders Gad anders.gad@siemens.com



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