Industry Information Live

Maskinsikkerhed med TIA-portalen – integreret og skalerbart

Værter Ole Dyval og Kim Meyer-Jacobsen

Siemens Digital Industries

Dagens værter

Kim Meyer-Jacobsen - Technology Specialist

Ole Dyval - Technology Specialist

Moderator **– Lars-Peter Hansen**

Maskinsikkerhed med TIA-portalen - integreret og skalerbart

Maskinsikkerhed med TIA-portalen – integreret og skalerbart

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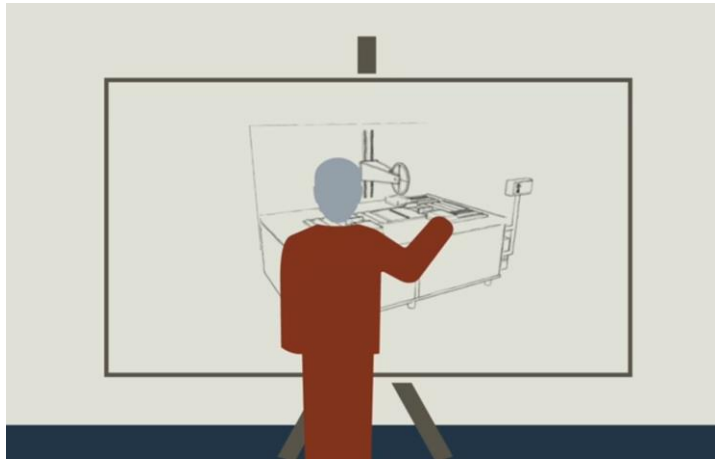
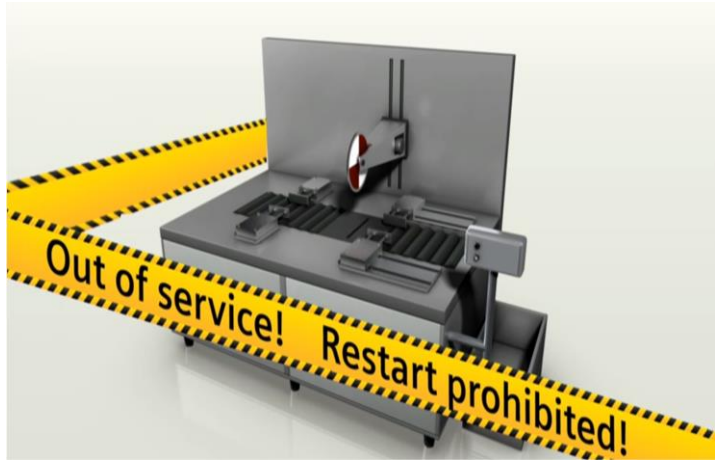
- **Hvad er Simatic Safety Integrated?**
- Hvordan kan man enkelt integrere safety-funktioner med TIA-portalen
- Eksempler på diagnosemuligheder
- Bonusinfo
- Q/A
- Kommende Webinar

Understanding and implementing Machine Safety





Werner von Siemens
Berlin, 1880

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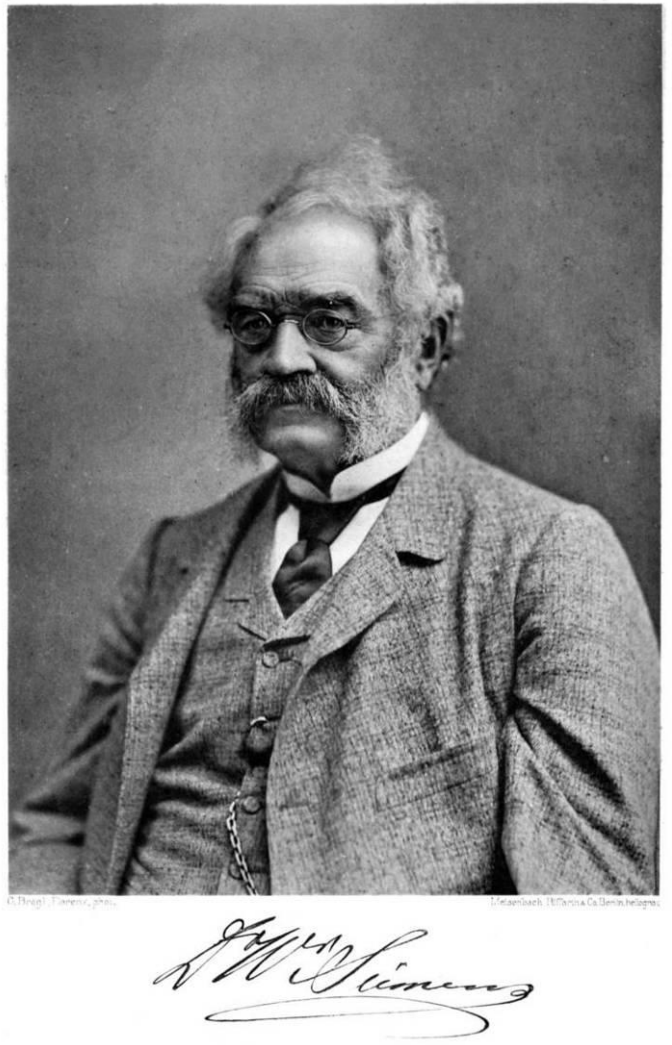
"The prevention of accidents must not be understood as a legal requirement, but as a precept of human duty and economic reason."



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If you want to master this

you have to deal with…

STO
Integrated added value
WEB server
Scalability
Shared Device
Evaluation Tool
EN ISO 12100
Safety Integrated
Openness
CE marking
Risk assessment
One Engineering
Everywhere
Access
SIL and PL
PROFISAFE
Proven components
IEC 62061
Risk minimization
ISO 13849-1
Digitalization
SIMATIC Controller
Usability

– ”

These topics define the SIMATIC Safety systems.

What do we protect against with SIMATIC Safety Integrated!

Electric shock	Heat and fire	Dangerous radiation	Hazard due to functional faults
			

Safety Integrated for personnel, machines and the environment

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What is SIMATIC Safety Integrated!

- An easy way to integrate simple or complex Safety function in to your TIA automation platform.

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What are the System Advantages Of SIMATIC Safety Integrated!

- One Controller
- One Engineering framework
- One Network
- Channel granular diagnostic info
- Flexibility in regards to Sensors, Actuators and Implementation

The path to a safe machine is completed by the EC declaration of conformity and CE marking.

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EC declaration of conformity

EG-Konformitätserklärung

Der Hersteller: Muster GmbH,
Musterstraße 65
D-27635 Musterstadt
Tel.: +49(0)48763/57647-0

erklärt hiermit, dass folgendes Produkt:

Produktbezeichnung: Beispielmaschine
Typenbezeichnung: K360
Seriennummer: 830489880
Baujahr: 2012

allen einschlägigen Bestimmungen der Richtlinie **Maschinen (2006/42/EG)** entspricht.
Die Maschine entspricht weiterhin allen Bestimmungen der Richtlinie **Elektromagnetische Verträglichkeit (2004/108/EG)**.

Folgende harmonisierte Normen wurden angewandt:

DIN EN ISO 12100 Sicherheit von Maschinen - Allgemeine Gestaltungsleitsätze - Risikobeurteilung und Risikominderung

DIN EN 60204-1 Sicherheit von Maschinen - Elektrische Ausrüstungen von Maschinen, Teil 1: Allgemeine Anforderungen

DIN EN ...

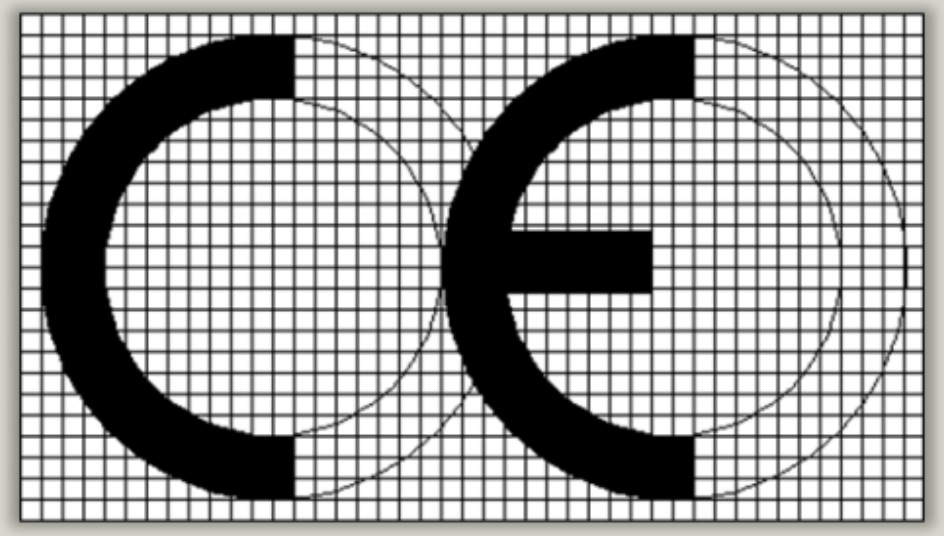
...

Name des Dokumentationsbevollmächtigten: Hans Muster
Adresse des Dokumentationsbevollmächtigten: siehe Adresse des Herstellers

Musterstadt,

Datum | Unterzeichner und Angaben zum Unterzeichner | Unterschrift

CE marking



Where to start?

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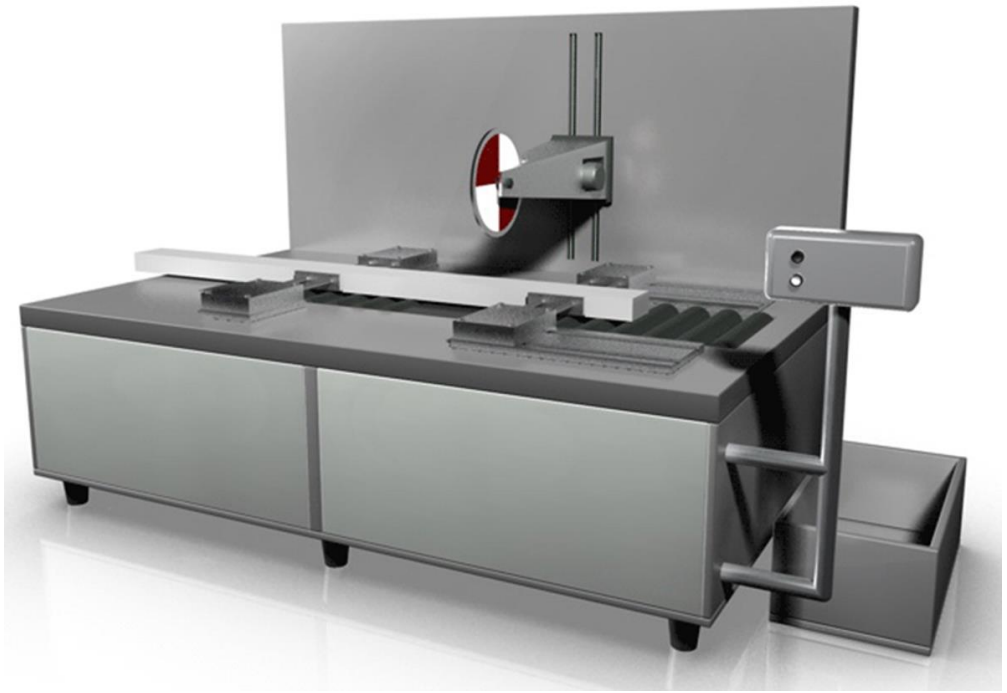

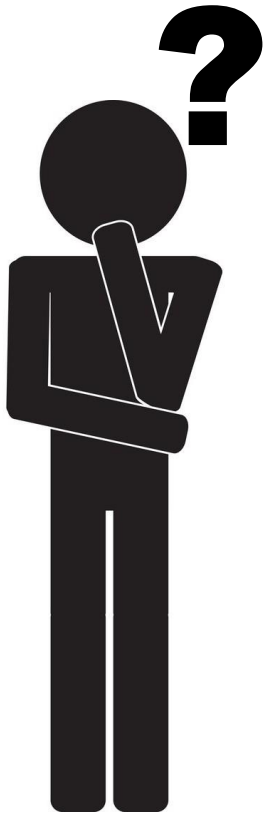

Describe the machine and identify hazards

The potential hazards can be identified according to EN ISO 12100.

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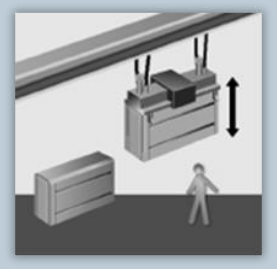
Risk assessment

Cutting	Dropping	Motion	Gravity	Approach	Rotation
					

The Machinery Directive involves three specific steps to achieve a safe machine.

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A high initial risk must be reduced to an acceptable residual risk.

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A high initial risk must be reduced to an acceptable residual risk.

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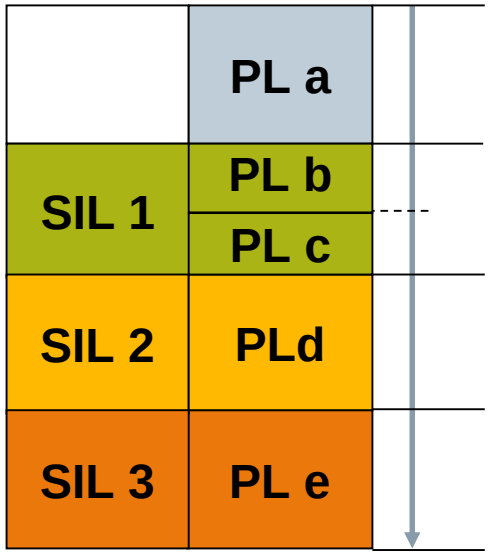
Risk minimization

The defined safety category (SIL, PL) determines the magnitude of the acceptable residual risk, and therefore the demanded reliability of the safety system.



10^{-4}

10^{-5}

$3*10^{-6}$

10^{-6}

10^{-7}

10^{-8}

Use "proven components", Regular functional tests, Automatic fault identification,Redundant design, Redundancy + fault identification

Not more than 1 potentially hazardous failure of the safety function in **10** years

Not more than 1 potentially hazardous failure of the safety function in **100** years

Not more than 1 potentially hazardous failure of the safety function in **1000** years

The safety concept can be developed based on the 3-stage method according to EN ISO 12100.

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Risk minimization

The Machine after Risk assessment - mechanical

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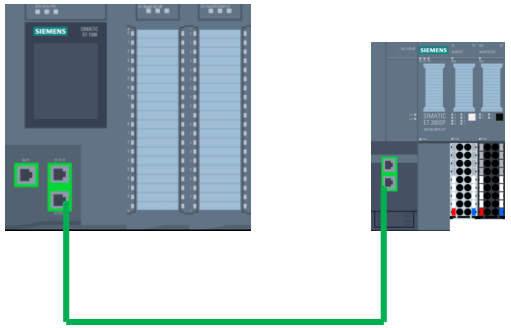
Risk minimization



The Machine after Risk assessment - electrical

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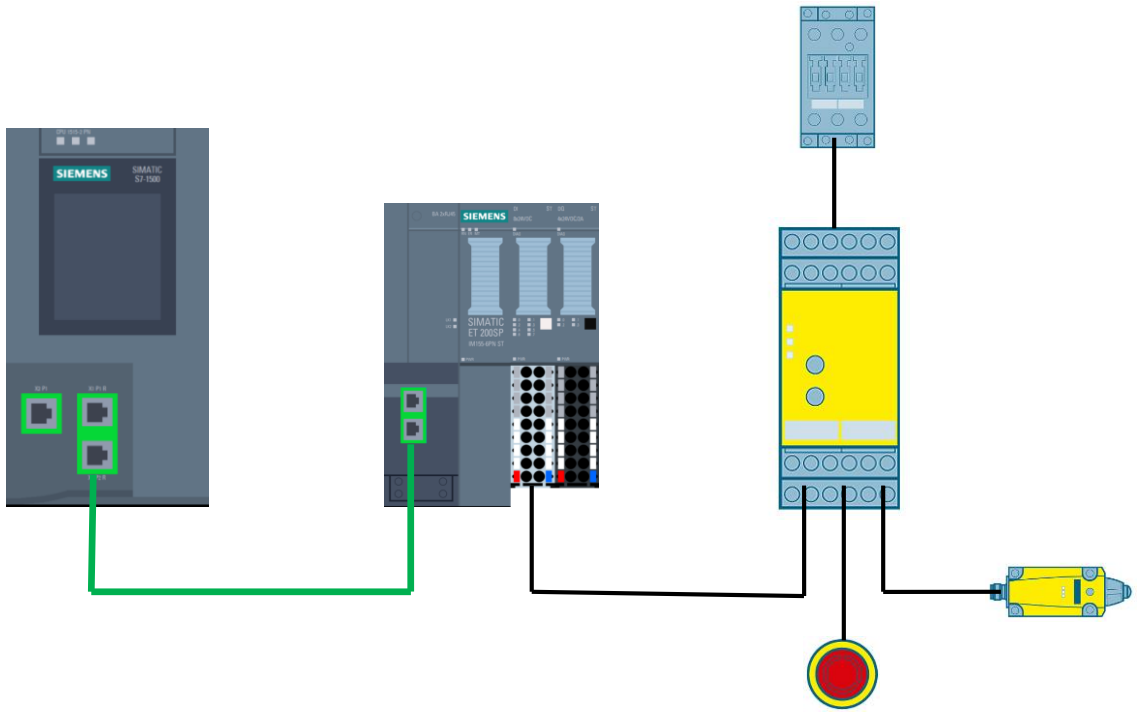

Implementing Safety Integrated

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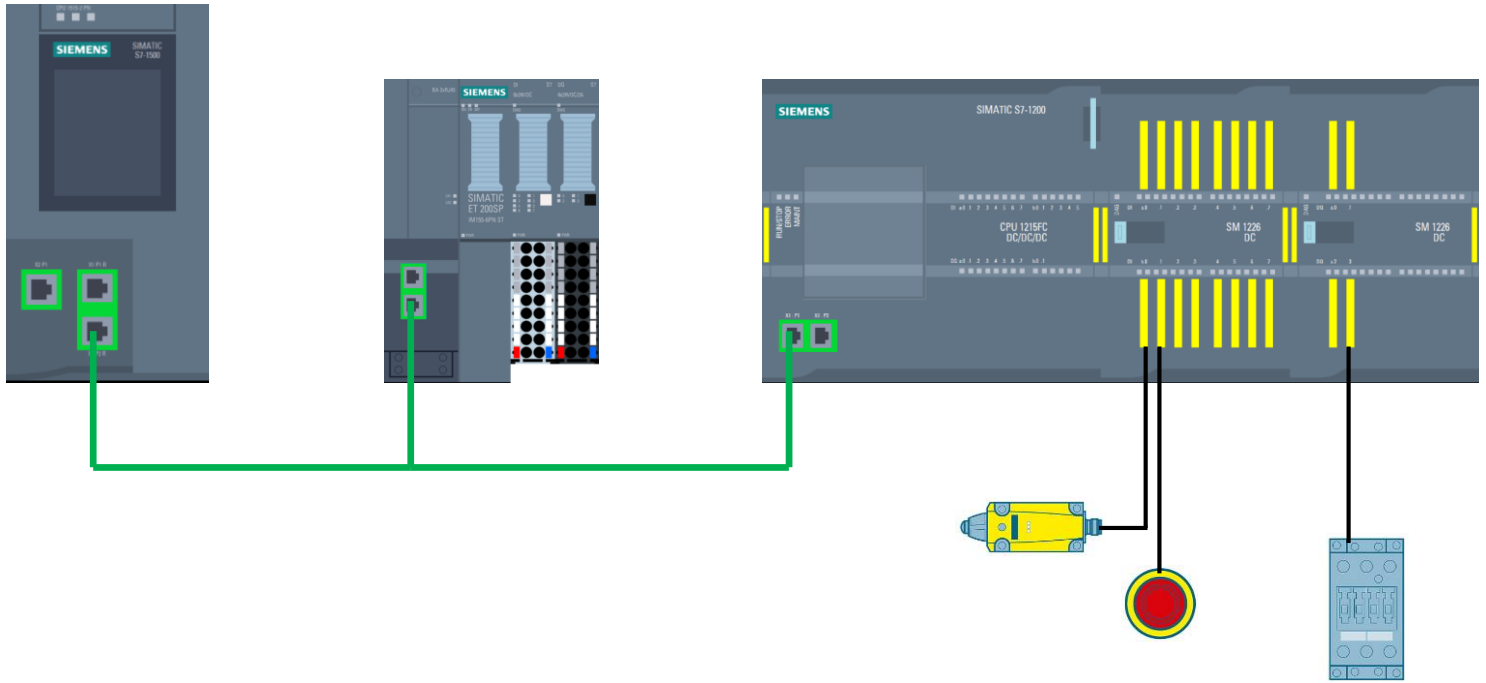

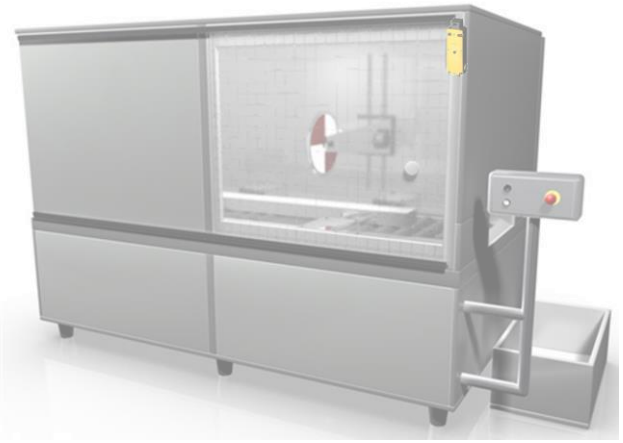

One Controller for Controlling and Safety

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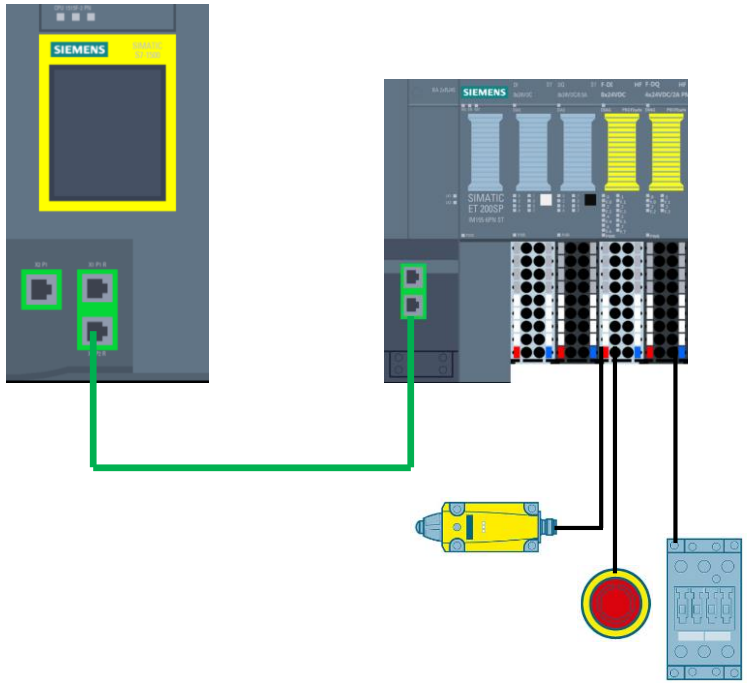

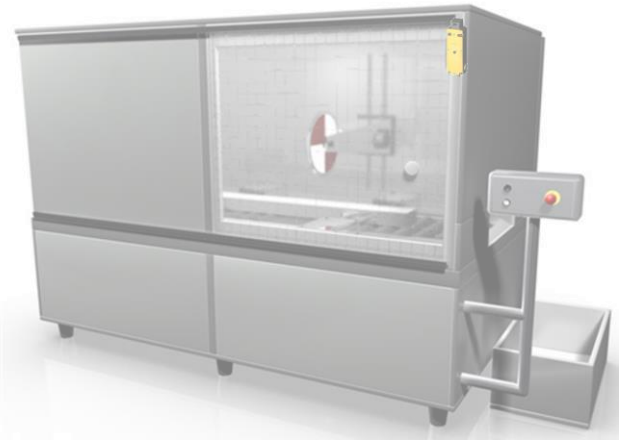

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The SIMATIC Controller portfolio always provides the right controller - Plus integrated added value!

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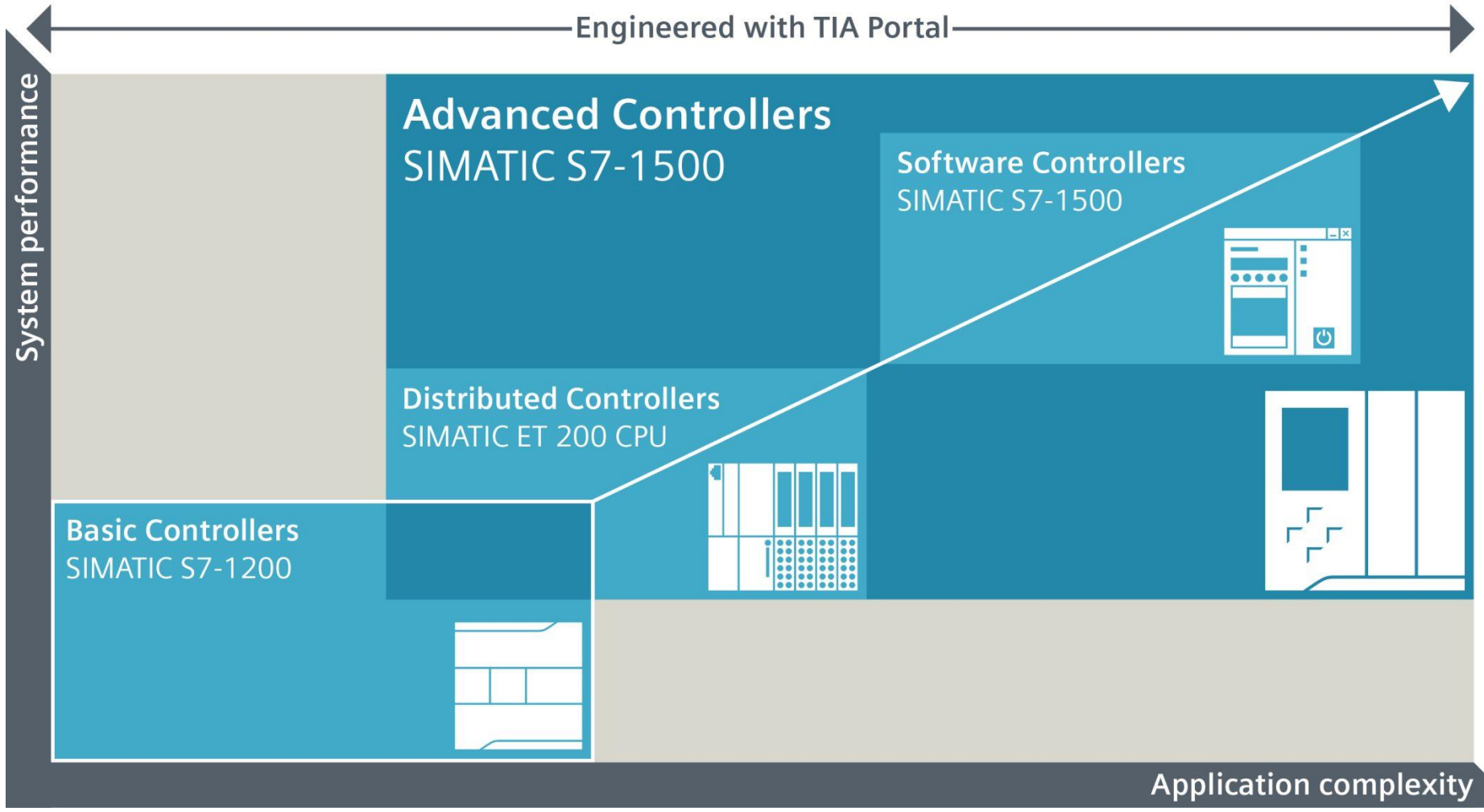

- Efficient engineering
- Innovative design
- Range of diagnostic options
- **Safety Integrated**
- Security Integrated
- Technology Integrated

Why is it safe?

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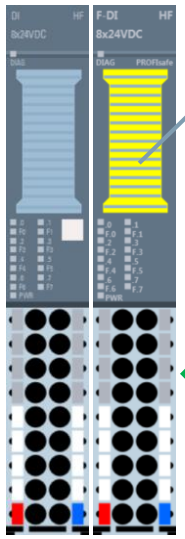
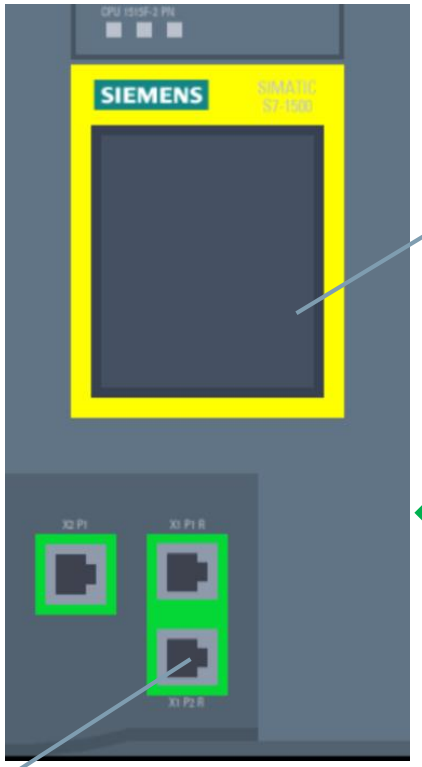


Discrepancy analysis

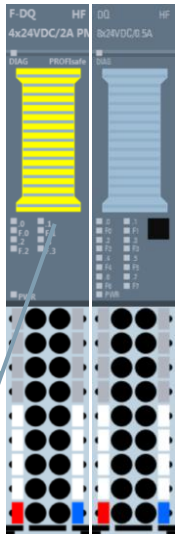
Short- cross-circuit monitoring



Operation systems expansion

Protection Mechanisms

Diverse part of the safety program generated by Safety Advance



Communication with the PROFIsafe profile

Wire break monitoring

Light- dark-test

Switch on test

Scalability with Drives

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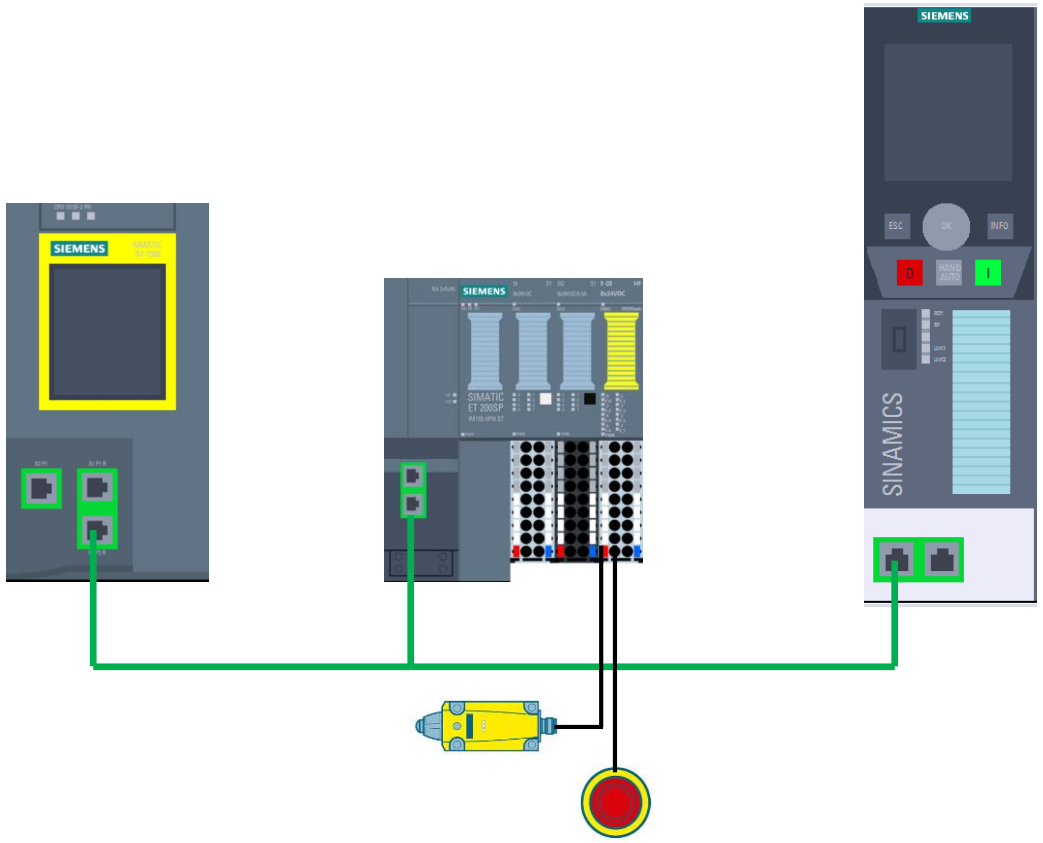

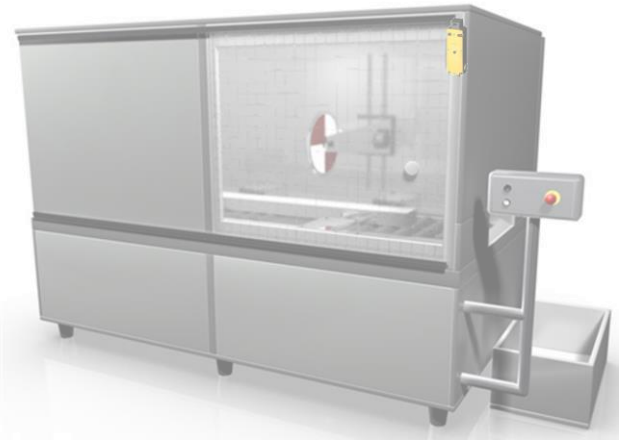

Safety functions overview

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Overview of safety functions in the drive

SINAMICS	STO	SS1	SS2	SOS	SBC	SBT	SLS	SLA	SSM	SDI	SLP	SP	SCA	Transfer F-DI
V90	✓													
G110M / G120C	✓													
G120 modular	✓	✓			✓ [2)]		✓		✓	✓				✓
G120D	✓	✓					✓		✓	✓				✓
S210	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				
G130 / G150	✓	✓			✓ [3)]						✓	✓		
S120 / S150	✓	✓	✓	✓	✓ [3)]	✓	✓	✓	✓	✓	✓	✓	✓	✓ [4)]

[2)] Only possible with CU 250S-2 with Safe Brake Relay

[3)] For Chassis and Cabinet Modules with Safe-Brake Adapter, for Blocksize formats with Safe Brake Relay

[4)] Only for CU310-2

Safety functions overview

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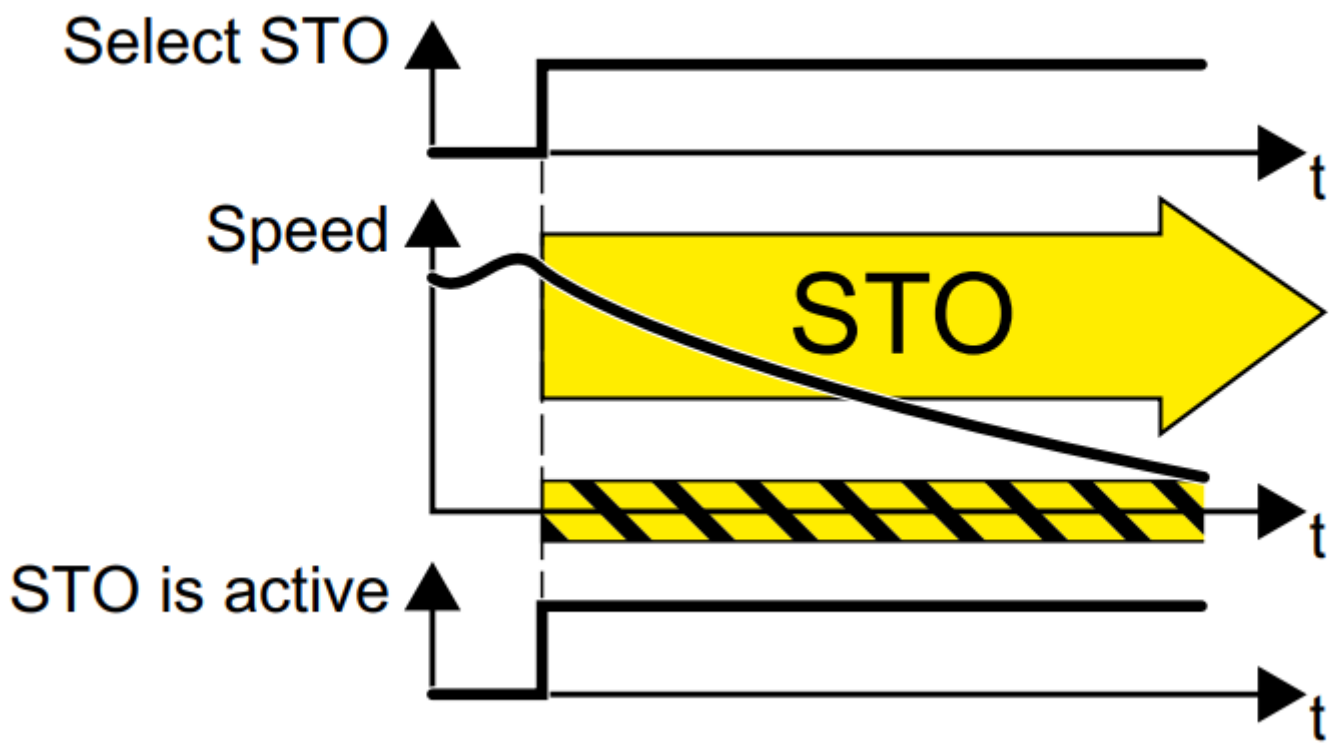
Ingenuity for life

Overview of safety functions in the drive

SINAMICS	STO	SS1	SS2	SOS	SBC	SBT	SLS	SLA	SSM	SDI	SLP	SP	SCA	Transfer F-DI
V90	✓													
G110M / G120C	✓													
G120 modular	✓													✓
G120D	✓													✓
S210	✓													
G130 / G150	✓													
S120 / S150	✓												✓	✓ [4]



ı CU 250S-2 with Safe Brake Relay

ɛsize formats with Safe Brake Relay

[4] Only for CU310-2

Safety functions overview

SIEMENS
Ingenuity for life

Overview of safety functions in the drive

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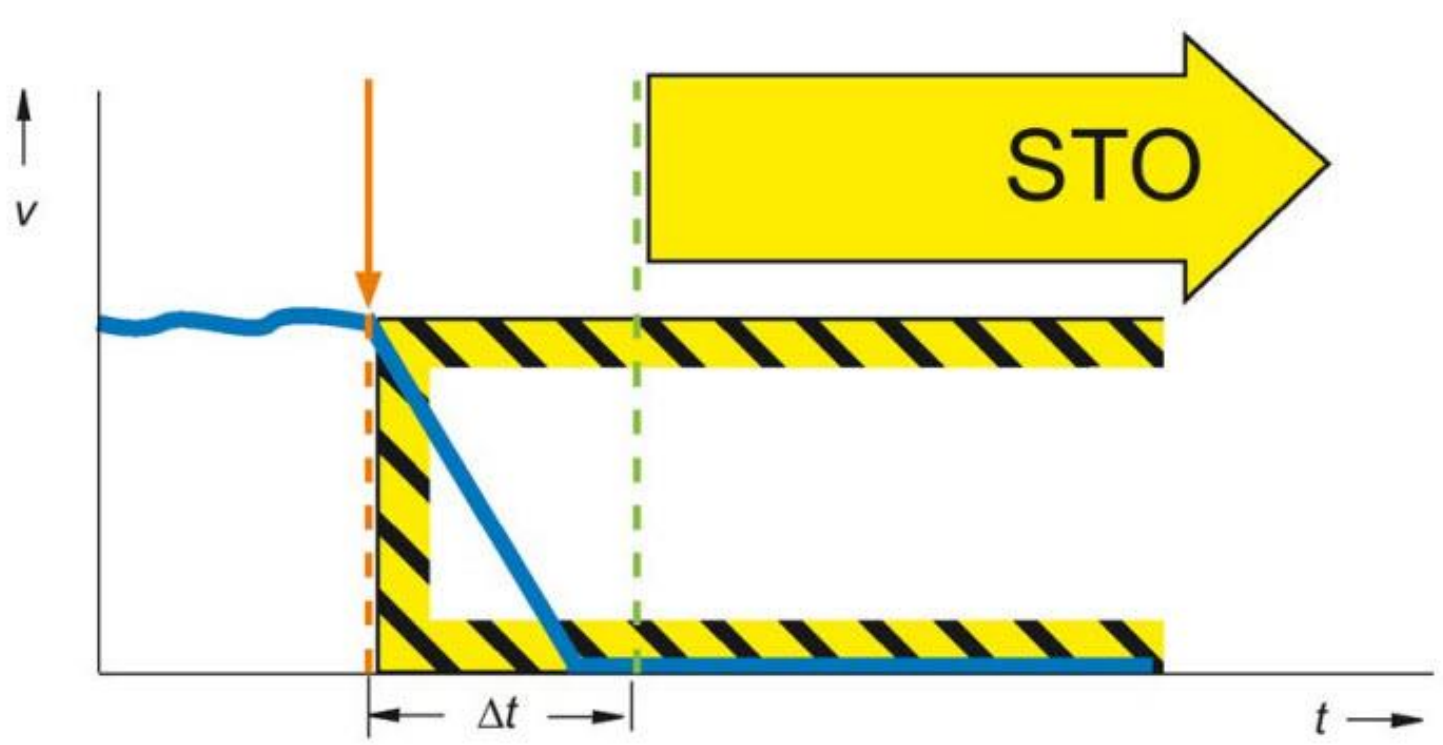
G110M / G120C	✓													
G120 modular	✓													✓
G120D	✓													✓
S210	✓													
G130 / G150	✓													
S120 / S150	✓												✓	✓ [4]



CU 250S-2 with Safe Brake Relay

size formats with Safe Brake Relay

[4] Only for CU310-2

LDrvSafe Library

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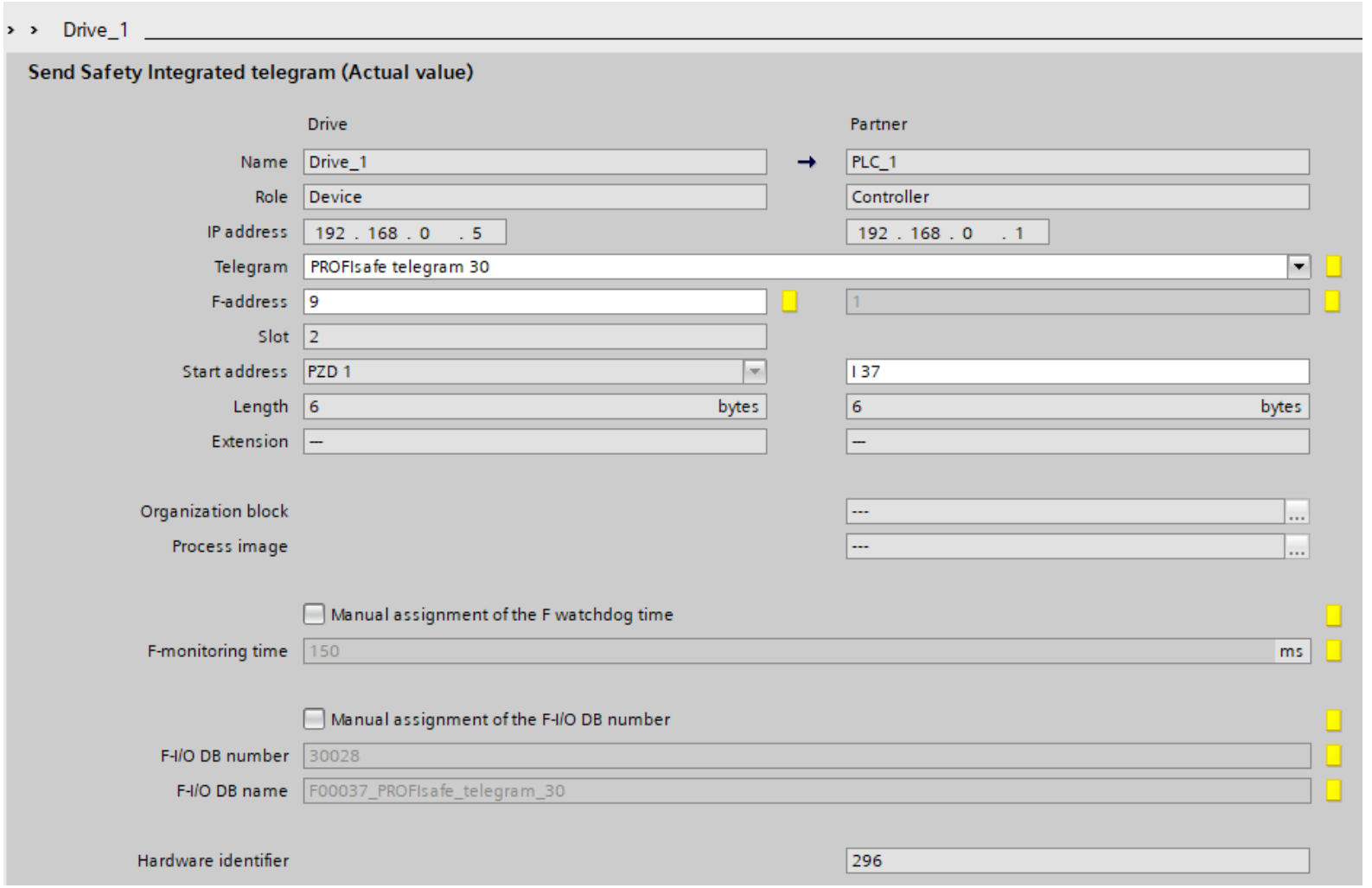

LDrvSafe Library

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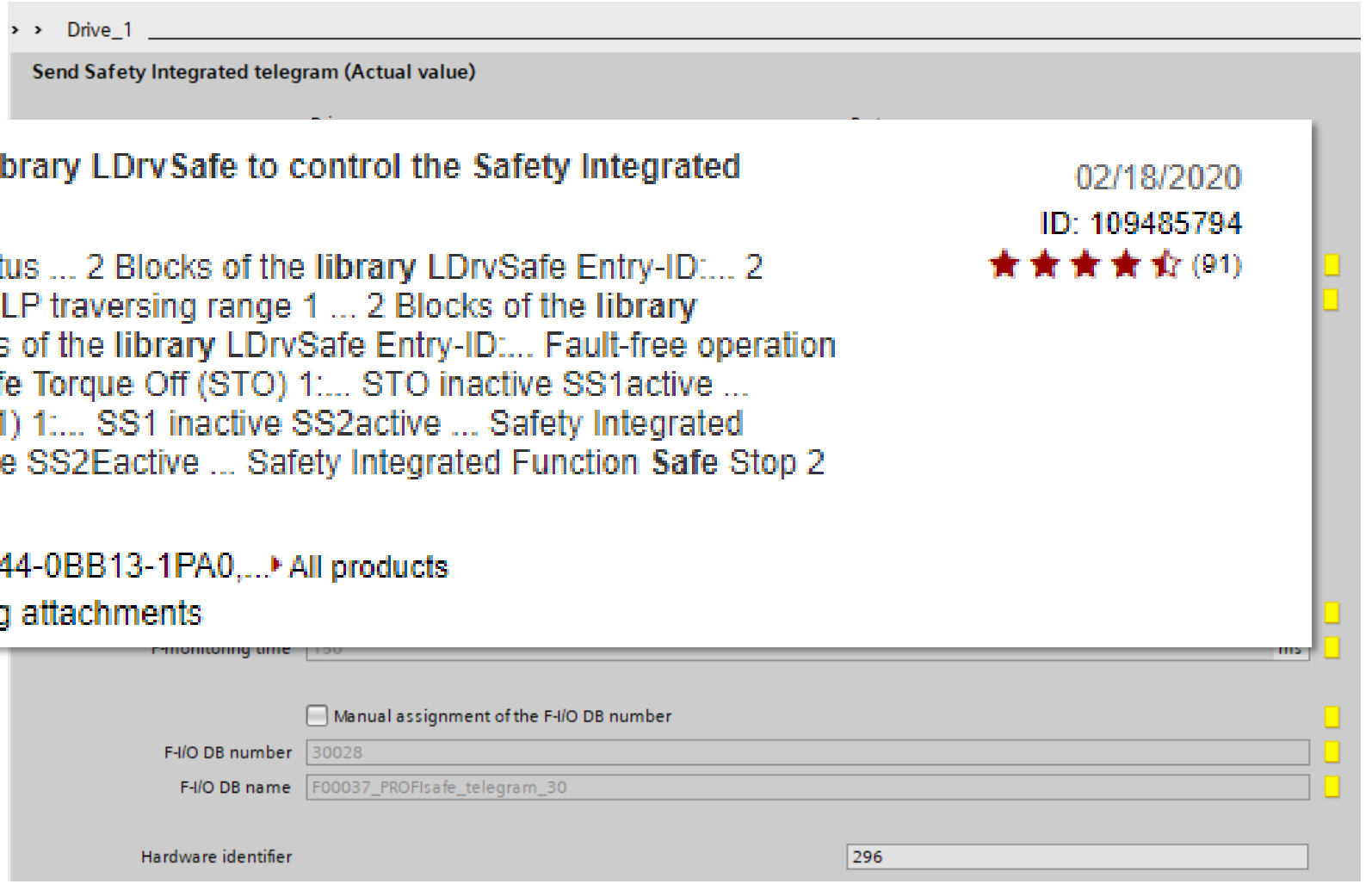

› Application example **SIMATIC - Failsafe library LDrvSafe to control the Safety Integrated functions of the SINAMICS drive family**

02/18/2020
ID: 109485794
★★★★½ (91)

Structure of block LDrvSafe_SinaTlg903Status ... 2 Blocks of the **library** LDrvSafe Entry-ID:... 2 Blocks of the **library** LDrvSafe Entry-ID:... SLP traversing range 1 ... 2 Blocks of the **library** LDrvSafe Entry-ID:... 32767 (100%) 2 Blocks of the **library** LDrvSafe Entry-ID:... Fault-free operation STOactive ... Safety Integrated Function **Safe** Torque Off (STO) 1:... STO inactive SS1active ... Safety Integrated Function **Safe** Stop 1 (SS1) 1:... SS1 inactive SS2active ... Safety Integrated Function **Safe** Stop 2 (SS2) 1:... SS2 inactive SS2Eactive ... Safety Integrated Function **Safe** Stop 2 with ... stop (SS2E) 1:

For products:6SL3244-0BB13-1FA0, 6SL3244-0BB13-1PA0,... All products

⊞ Additional hits in the chapters of following attachments

LDrvSafe Library

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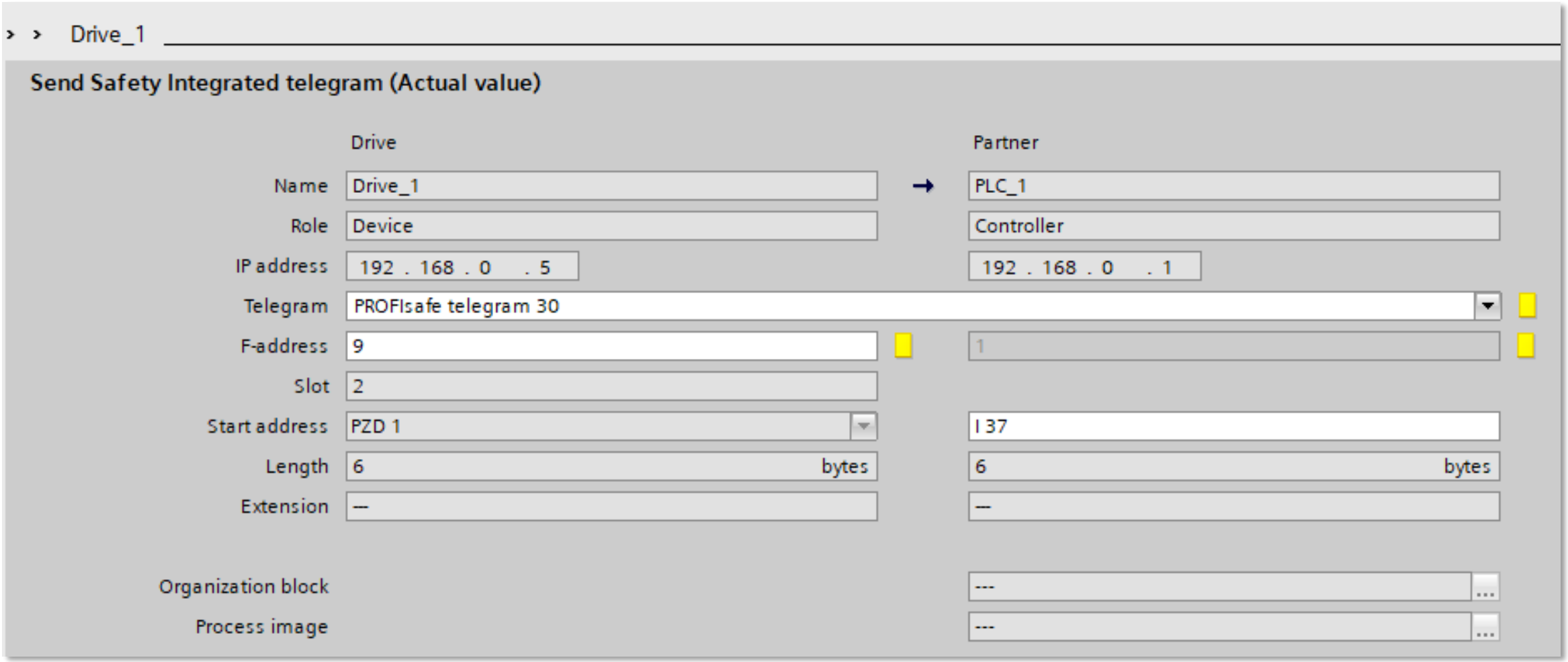

LDrvSafe Library

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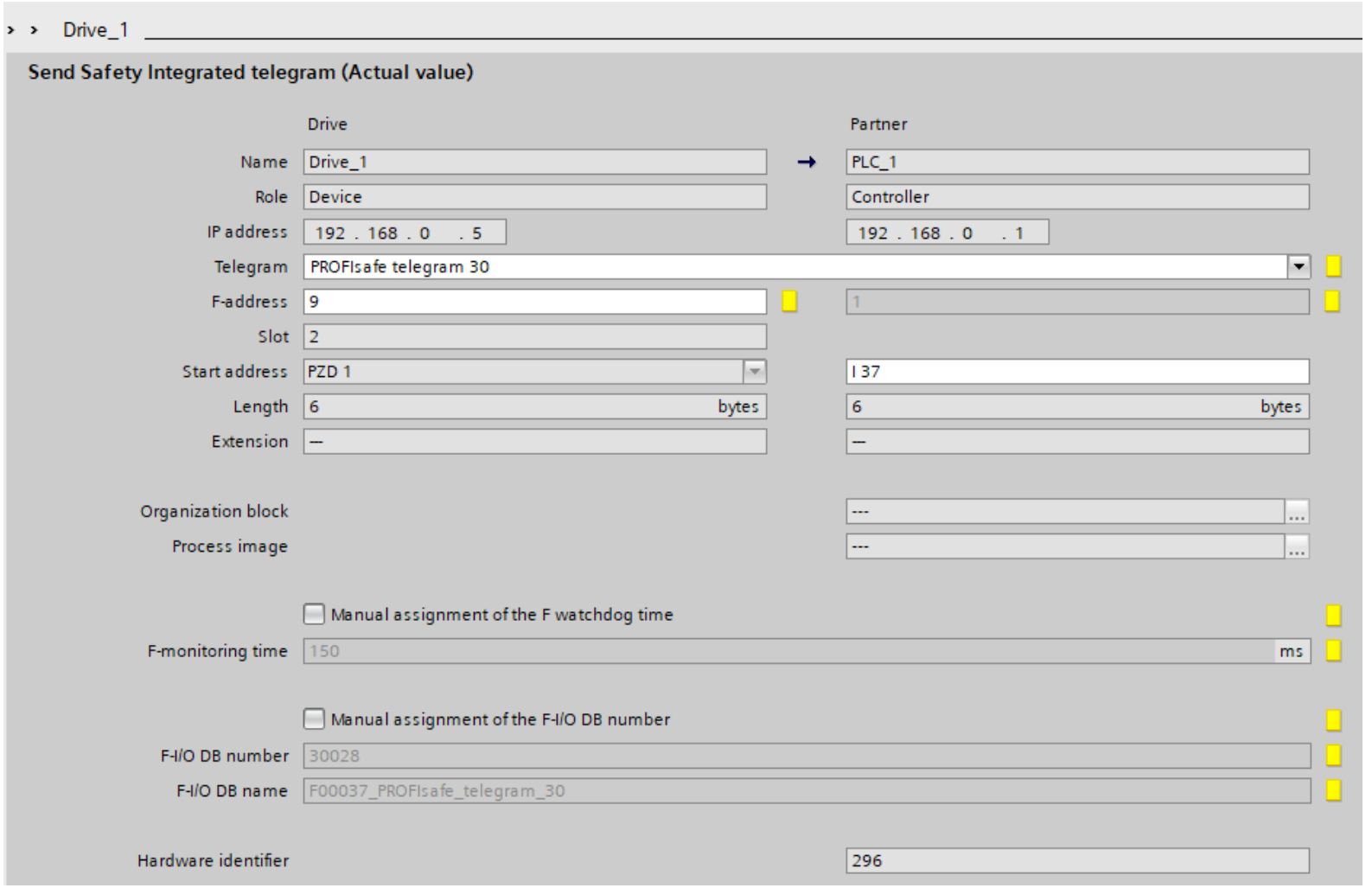

LDrvSafe Library

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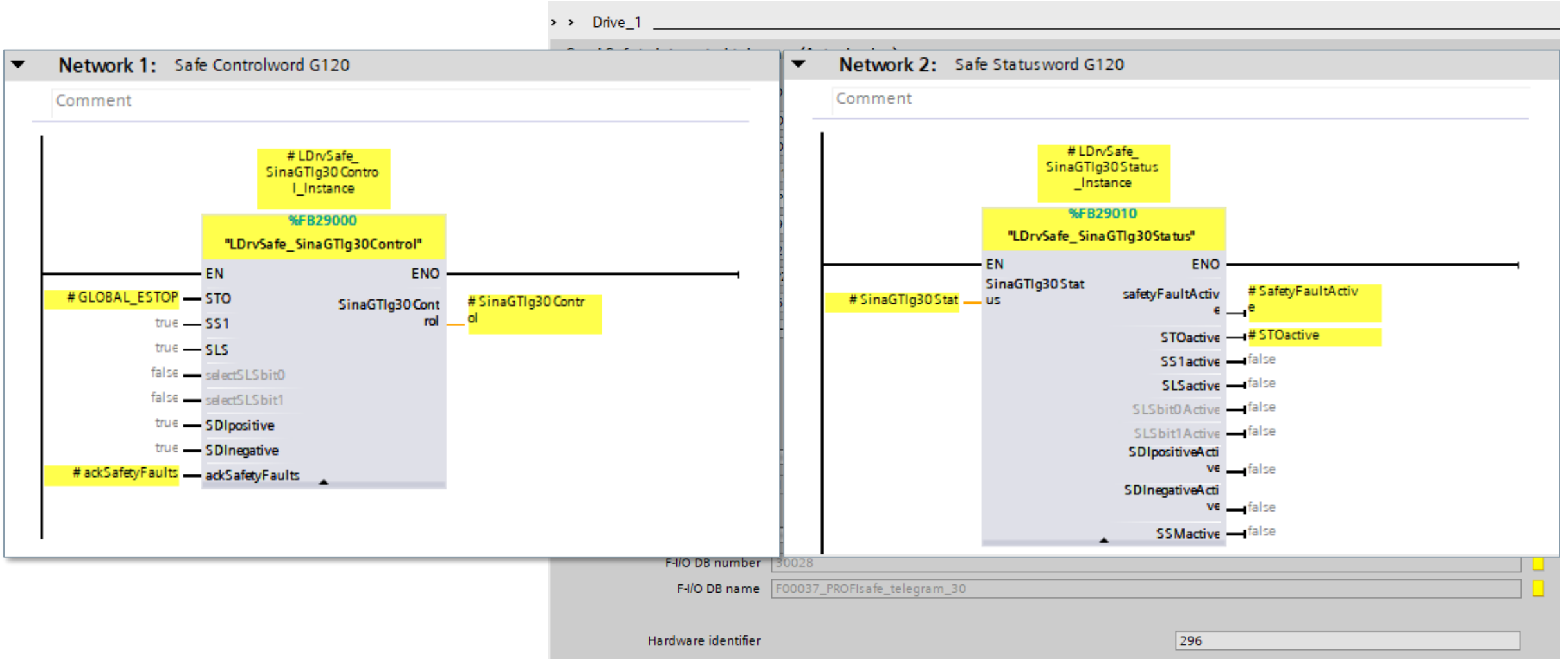

SINAMICS Startdrive V16
Feature extension – Acceptance test

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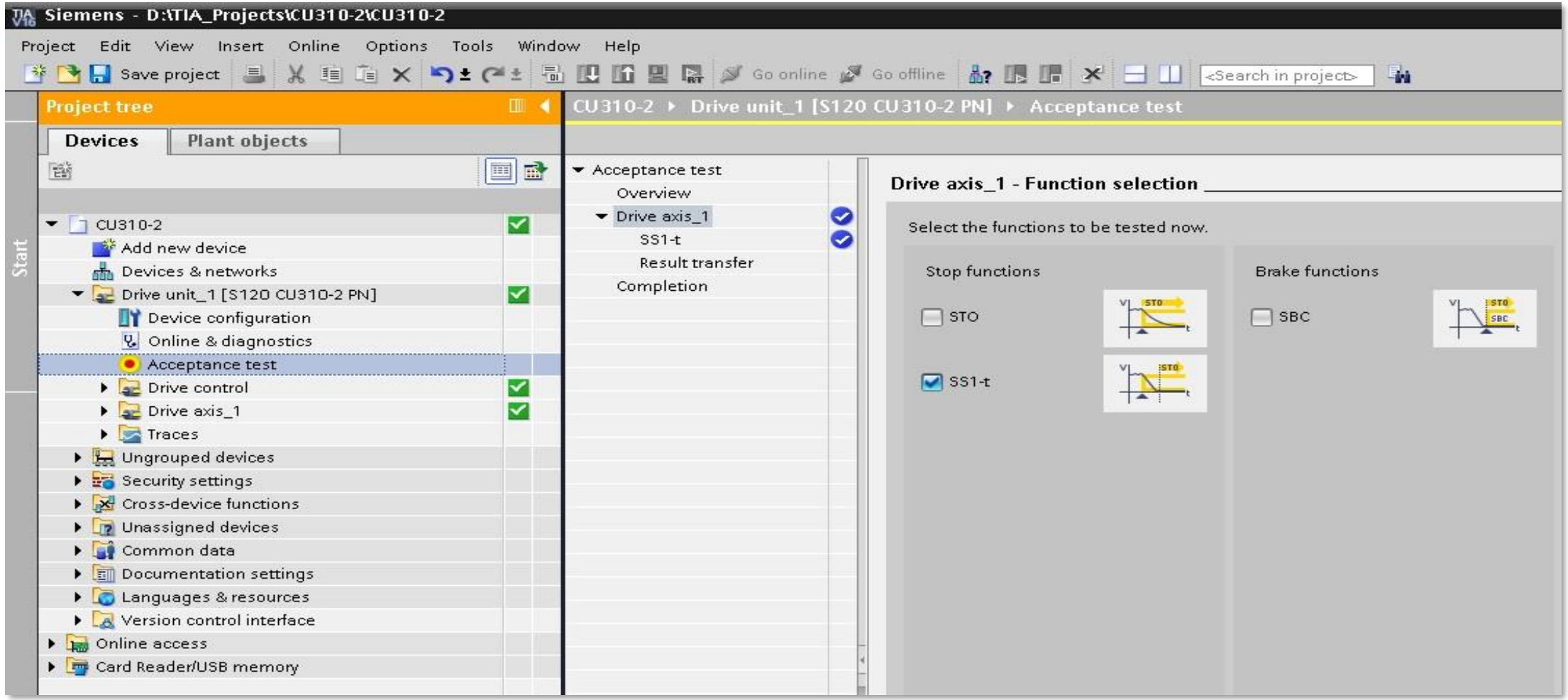

F-runtime group

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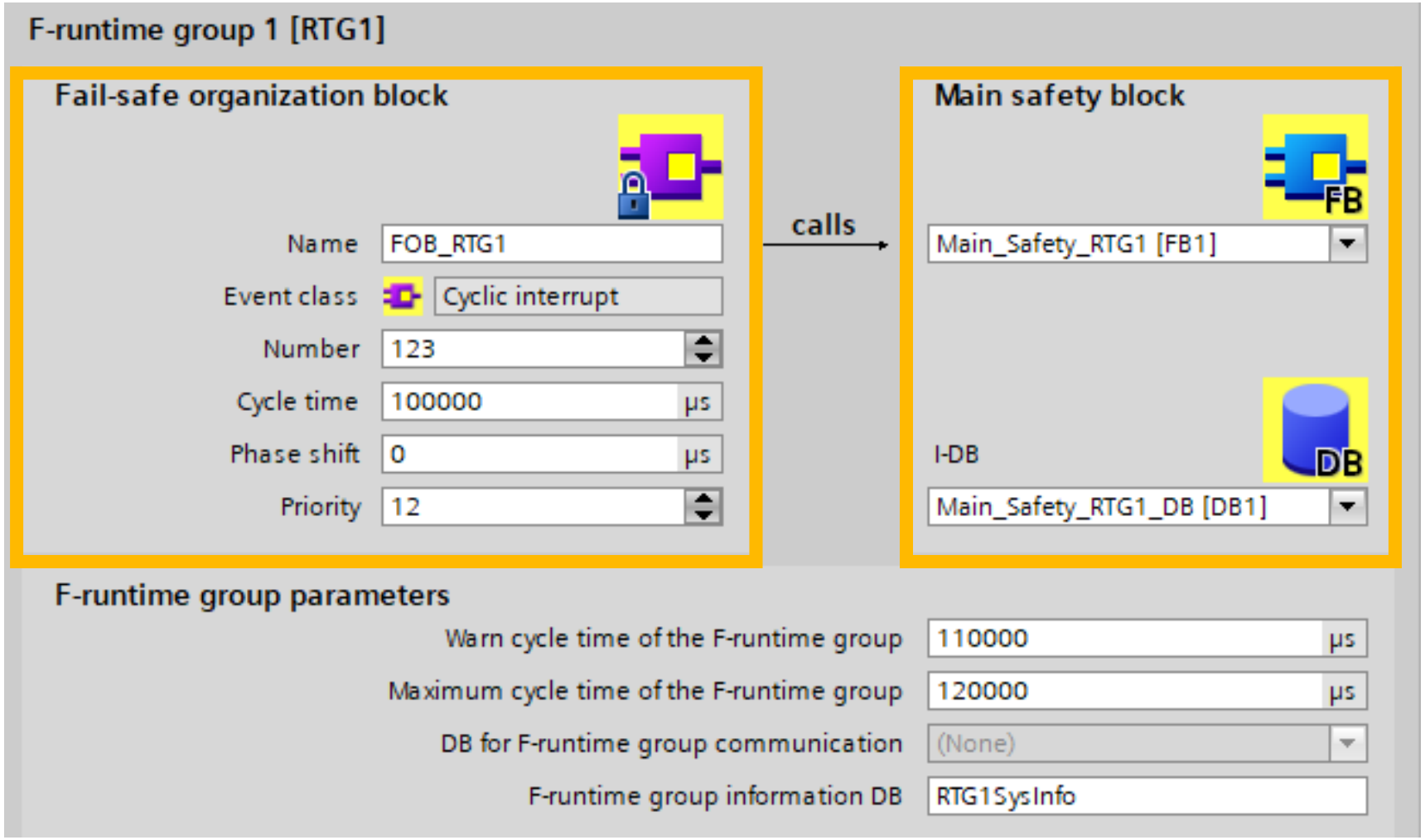

F-runtime group

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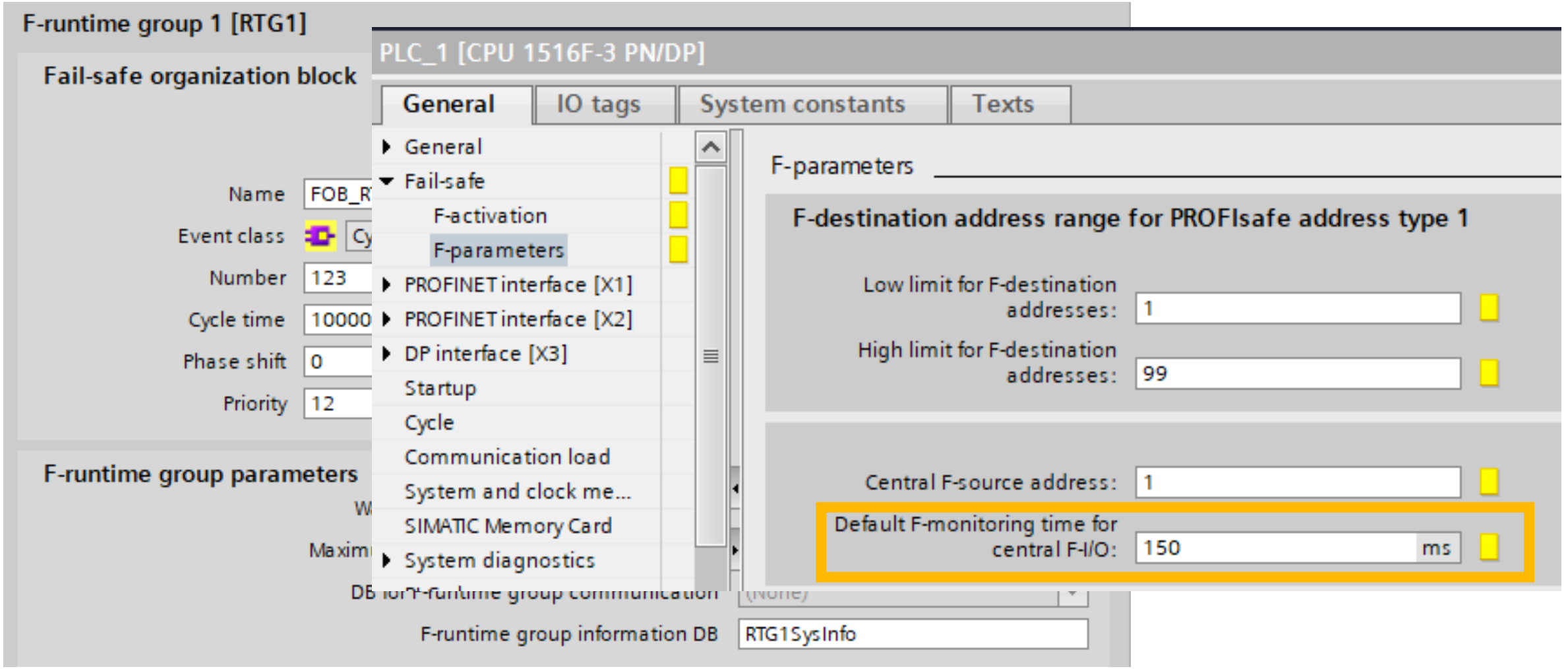

PL / SIL by design

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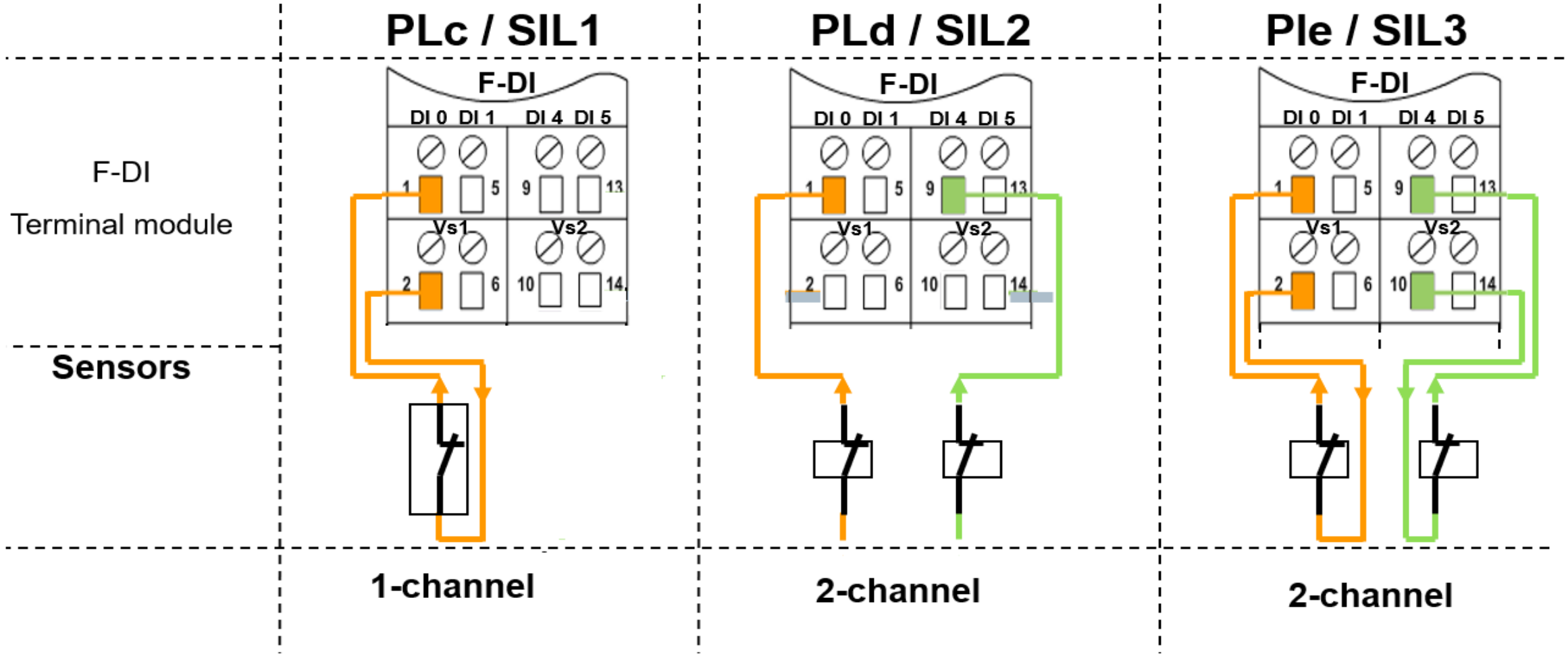

PL / SIL by design

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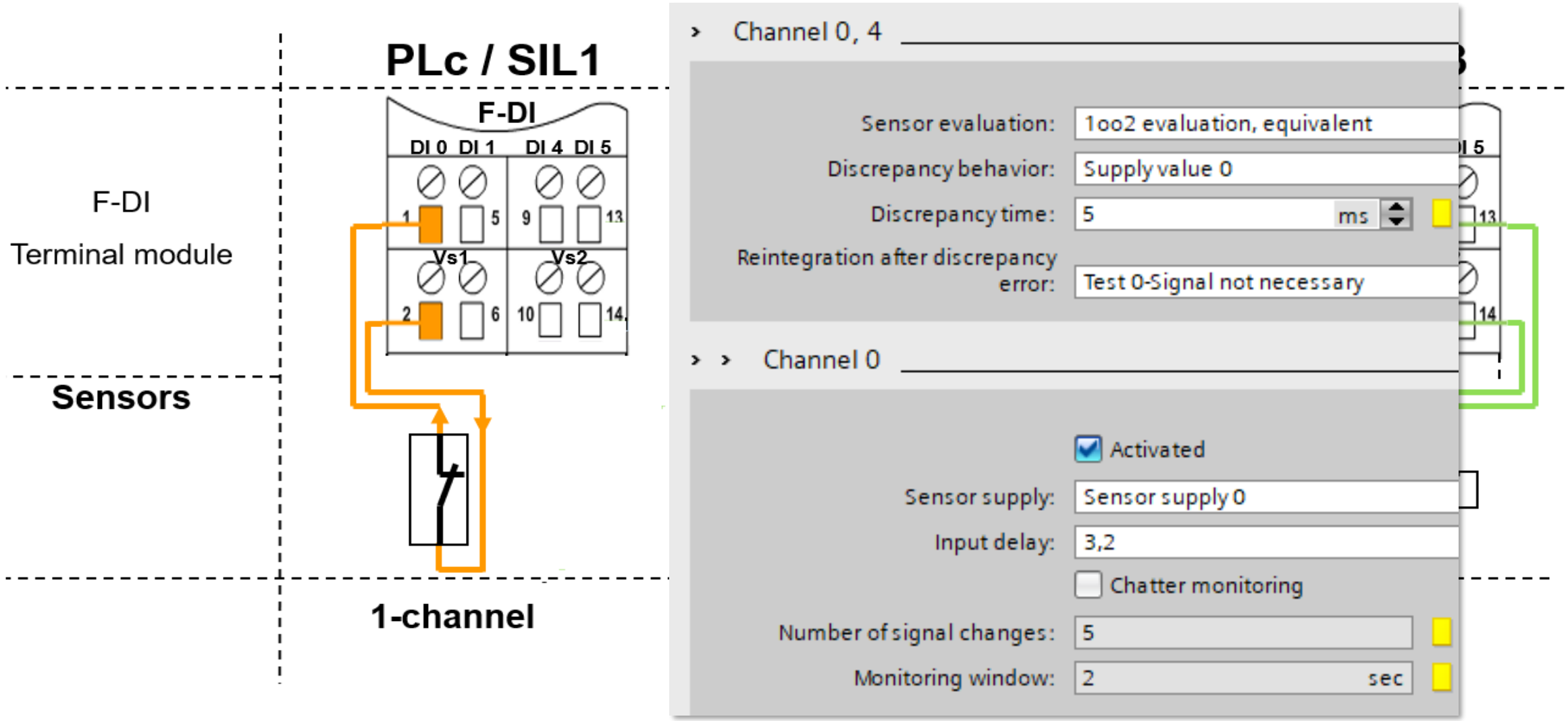

Safe instructions certified by TÜV

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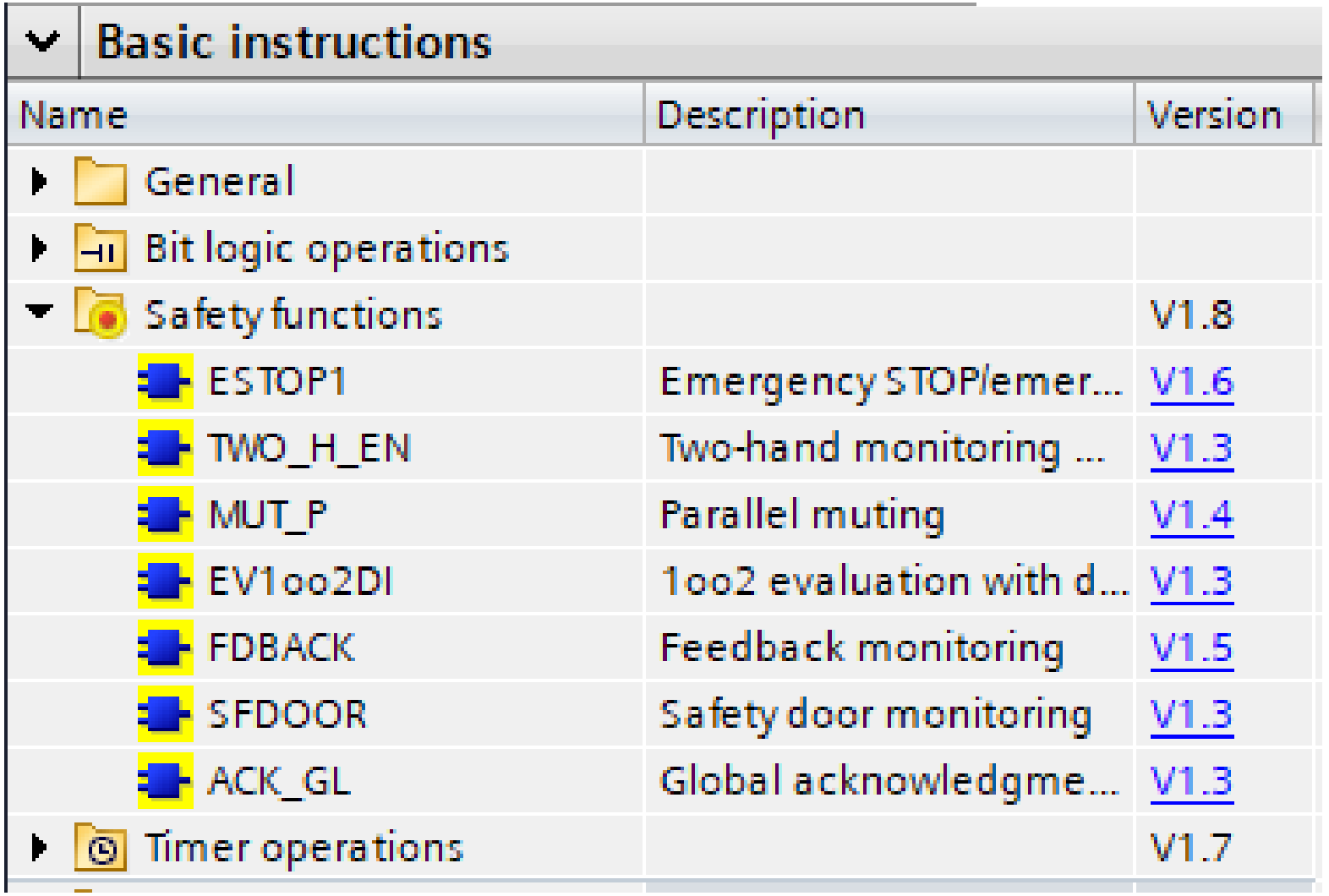

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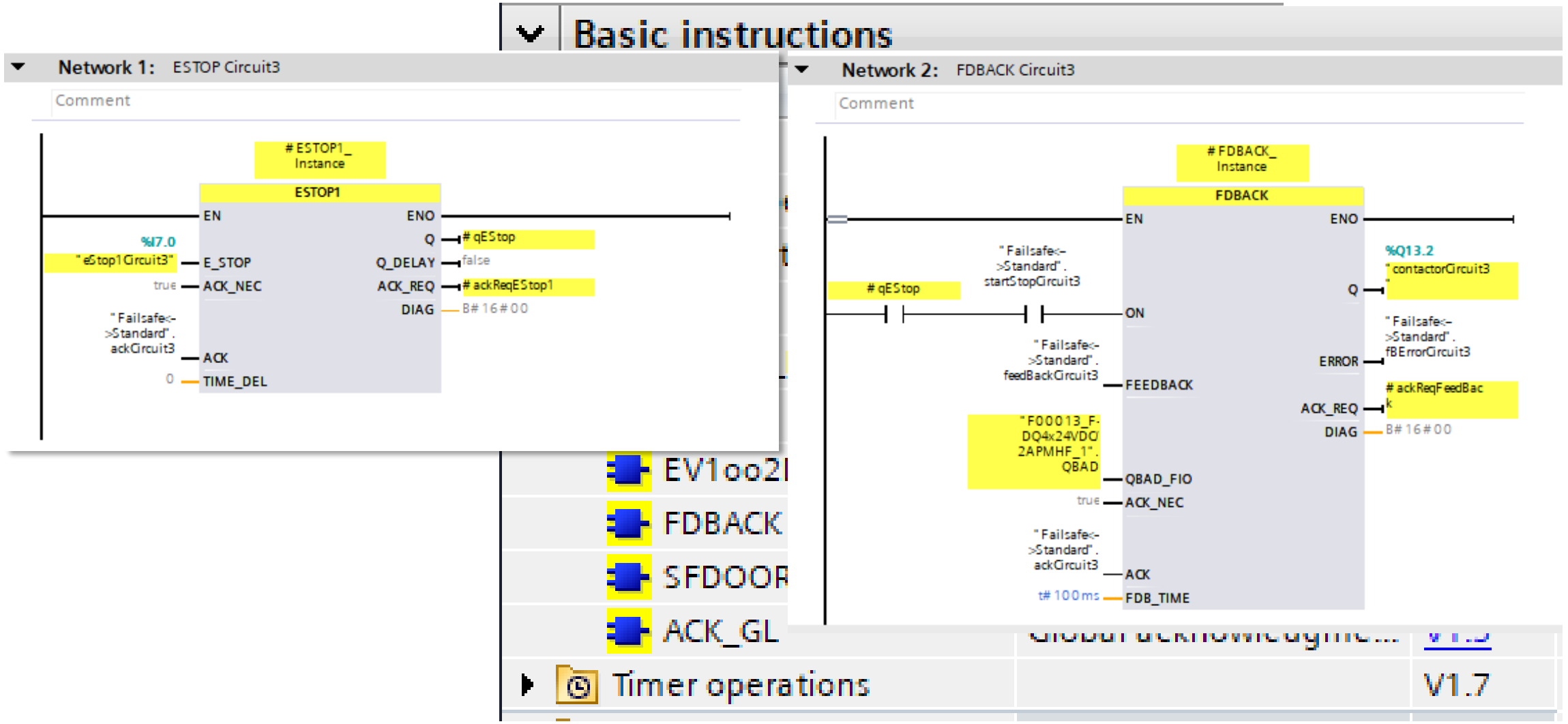

How to get help and information
Service og Support

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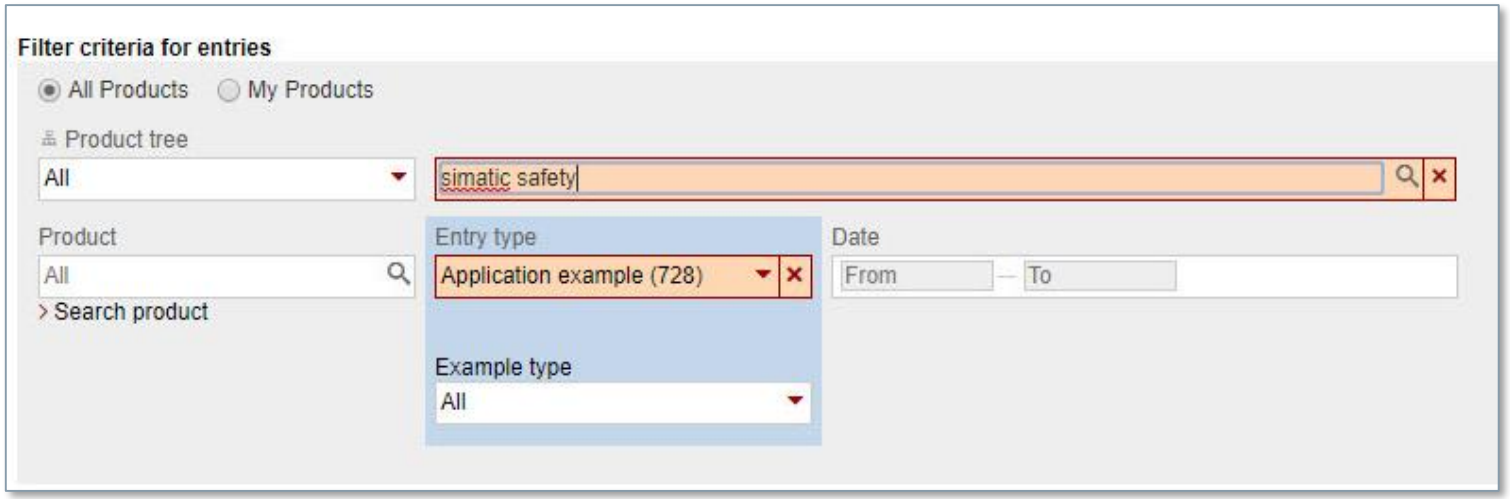
- **Safety Integrated programming guideline**
- **Safety with the S7-1200 FC CPU**
- **SLS specification via HMI**
- **Configuration control with safety**
- **PROFIsafe address assignment**
- **Mode selection**



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Display information

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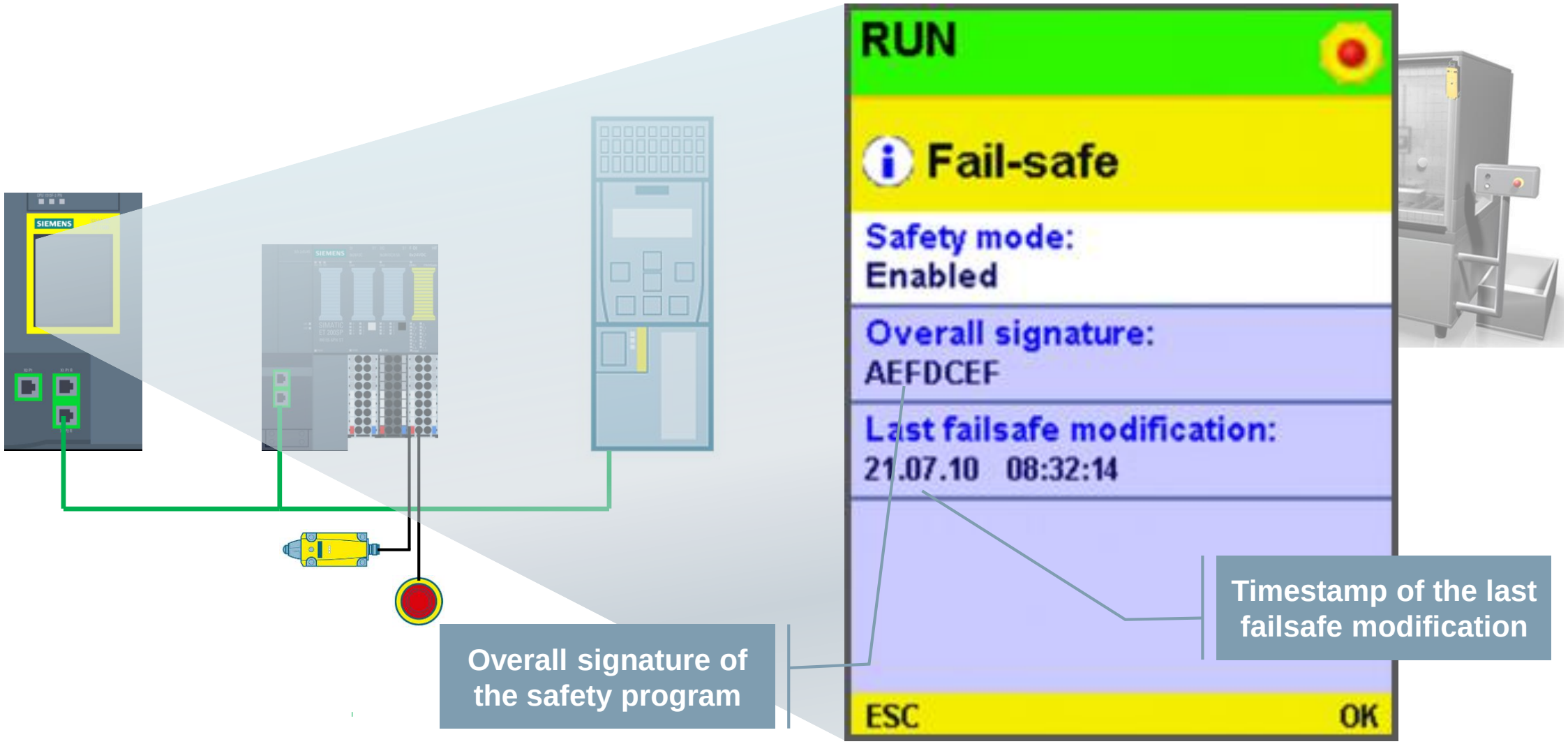
Ingenuity for life



Diagnostics in clear text

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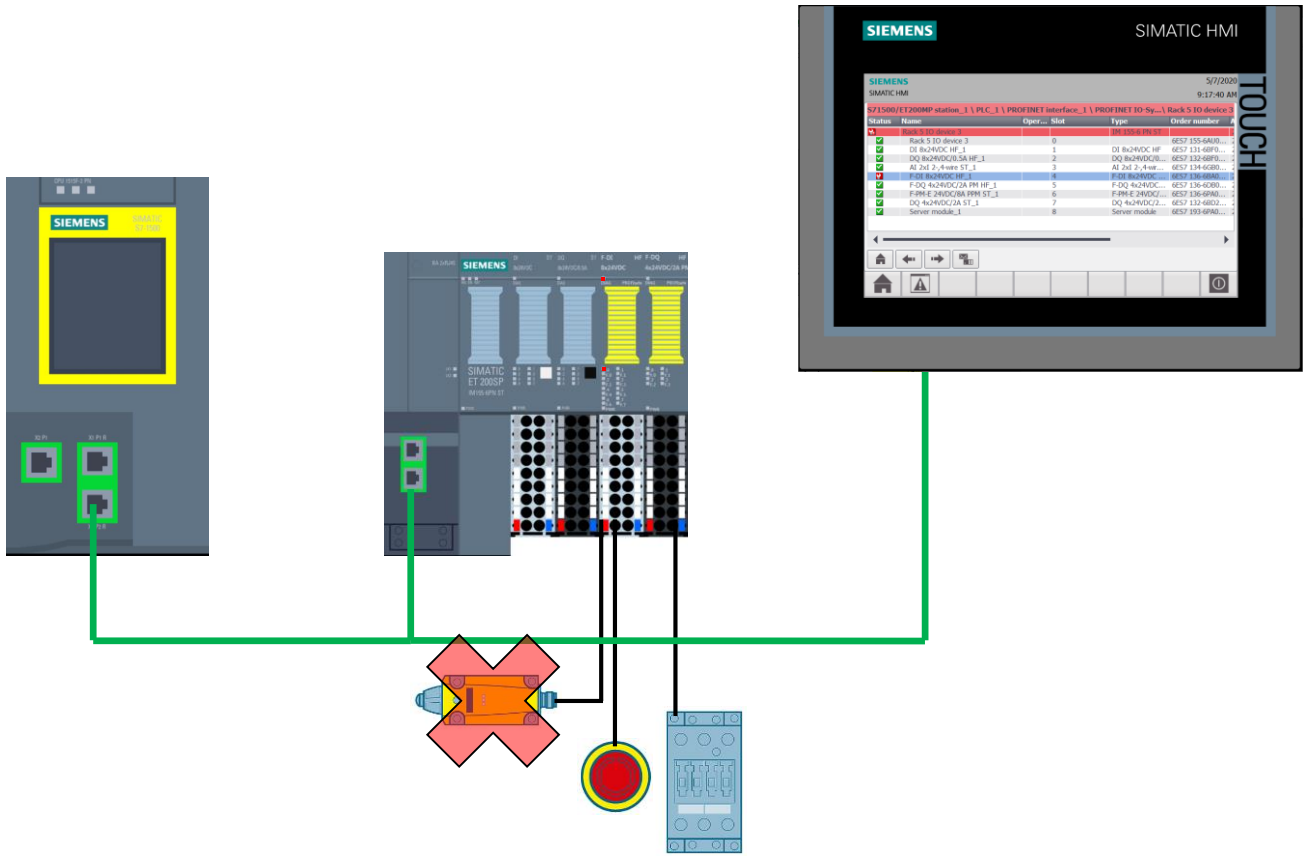
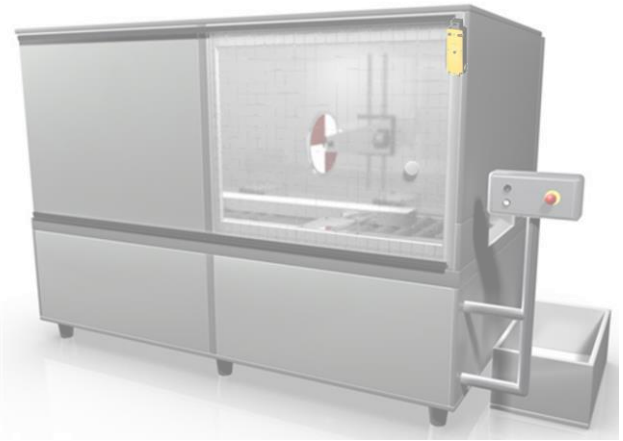
Ingenuity for life





Diagnostics in clear text

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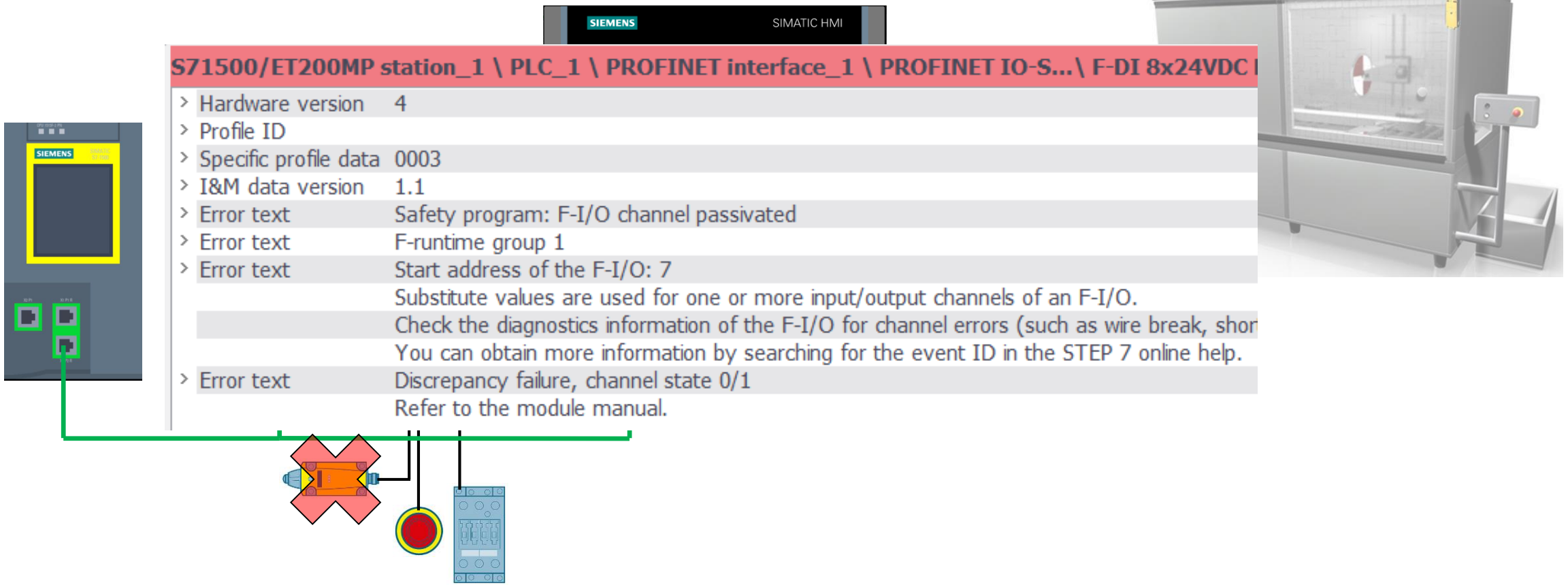

Safety functions

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Detection

Evaluation

Reaction

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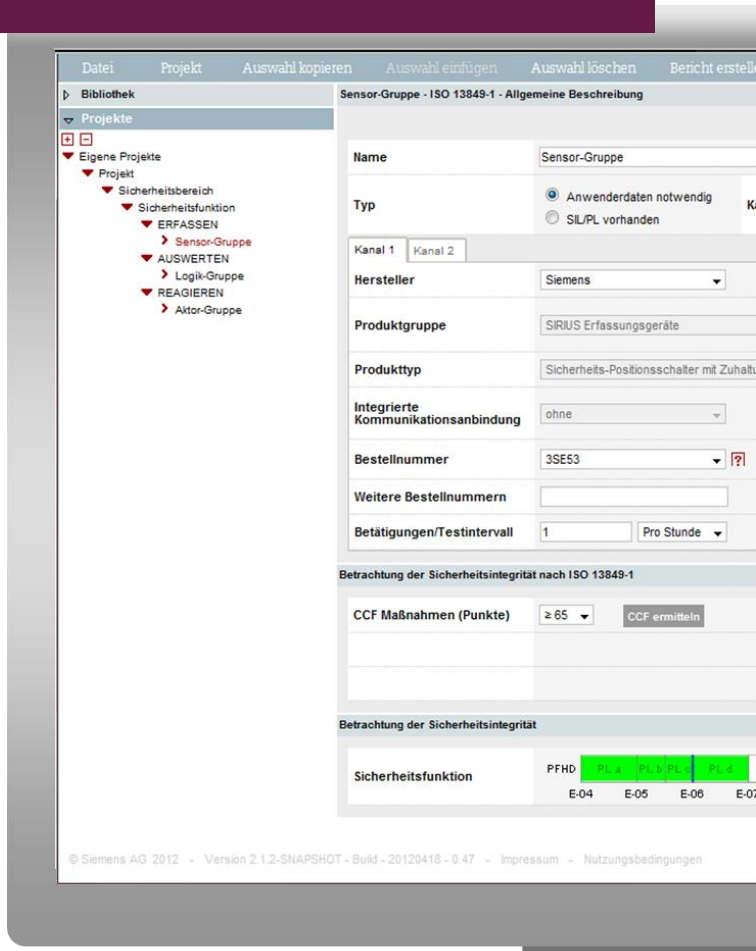
Risk mitigation

The checking of safety functions is a MUST!

- Prescribed by the standards EN ISO 13849 and EN 62061
- Safety concept must be evaluated and documented by way of the failure probability calculation
- Evaluation possible with SET: ***Safety Evaluation Tool***
- Free use of the online tool



Training by SITRAIN

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SITRAIN – Digital Industry Academy

Følg med tiden og hold dig opdateret

Nye teknologier kommer hele tiden til, og det betyder, at vi løbende skal holde os opdateret. Hos SITRAIN kan du finde relevante uddannelser og kurser tilpasset dine og din virksomheds behov.

Du kan se alle vores kurser her og har du spørgsmål er du velkommen til at skrive til os.

› Kursusliste

Kender du allerede SITRAIN? Kom igang med det samme!

SITRAIN open
Siemens Industry Online Support ›

SITRAIN personal
Specifikke kursus tilbud fra Siemens ›

SITRAIN access
Webbaseret træning ›

www.siemens.dk/sitrain

Summary

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Now I am Safe ☺

Maskinsikkerhed med TIA-portalen – integreret og skalerbart

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- Hvad er Simatic Safety Integrated?
- Hvordan kan man enkelt integrere safety-funktioner med TIA-portalen
- Eksempler på diagnosemuligheder
- **Bonusinfo**
- Q/A
- Kommende Webinar

TIA Portal Cloud as TRIAL

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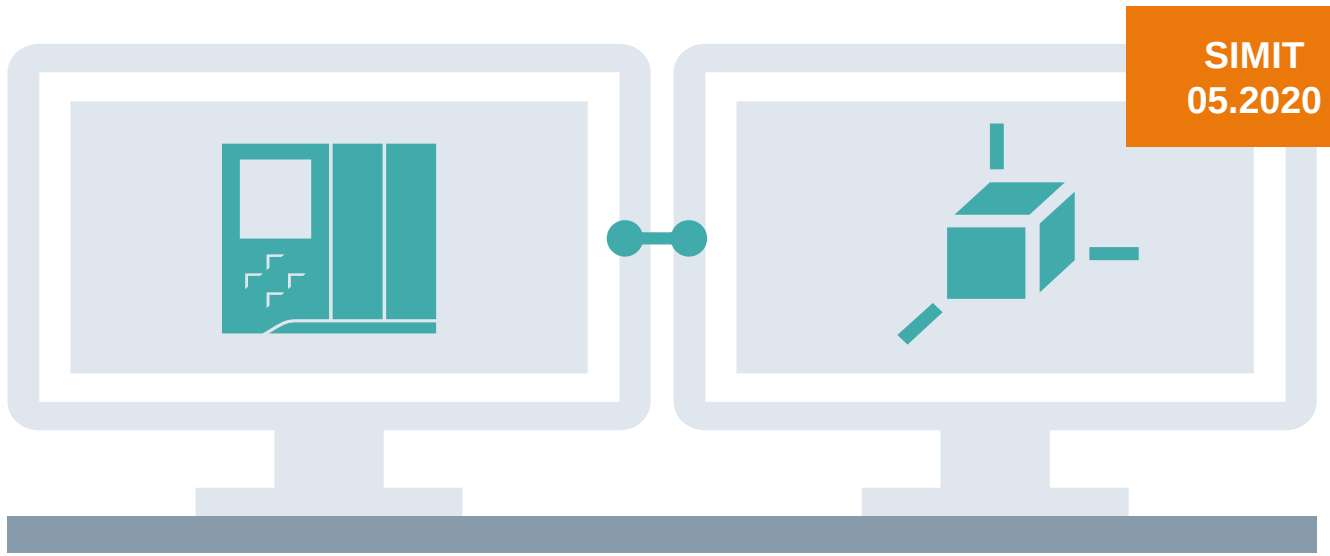

TIA Portal Suite
includes STEP 7, WinCC Advanced, Safety, PLCSIM Advanced, Startdrive and other option packages

SIMIT

21 days free usage

Customers

- Fore registered customers
- Free access via Voucher
- Test your skills
- Try all the Simulators
- No installations is needed
- All necessary updates is included

www.siemens.com/simulation-cloud

TIA Portal Cloud as TRIAL
How does it work (based on time limited Voucher)?

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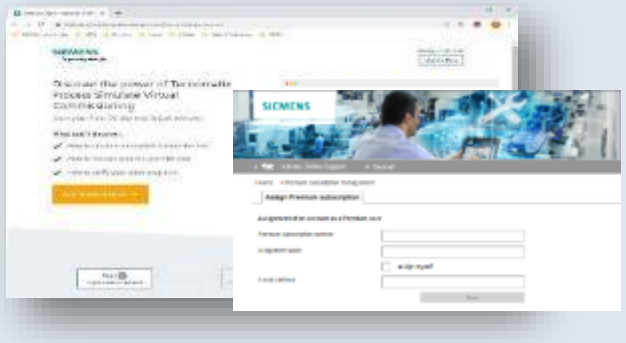
1 Sign-up and register on website

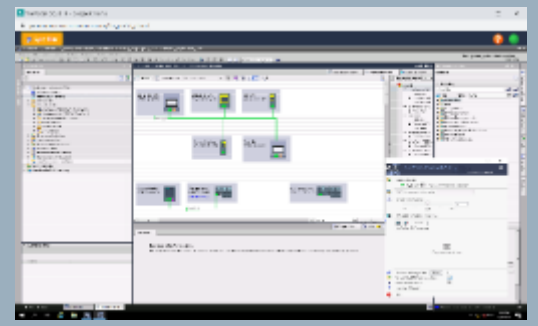


- DAMEX approval (Product and Customer)
- Terms & Conditions by User
- Creates and sends voucher with link to SISC
- User upgrades Account with Voucher credentials in SISC

2 Launch Industry Premium Portal

- Login with standard web browser
- Terms & Conditions (before use)
- No productive usage – only **TRIAL**

3 21 days free use



- TIA Portal V15.1 / V16
- WinCC Unified PC
- PLCSIM Advanced
- SIMIT (05/2020)

Yderligere information

Gense webinar og download materiale på
www.siemens.dk/di-webinarer
Find tips og trick på YouTube

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