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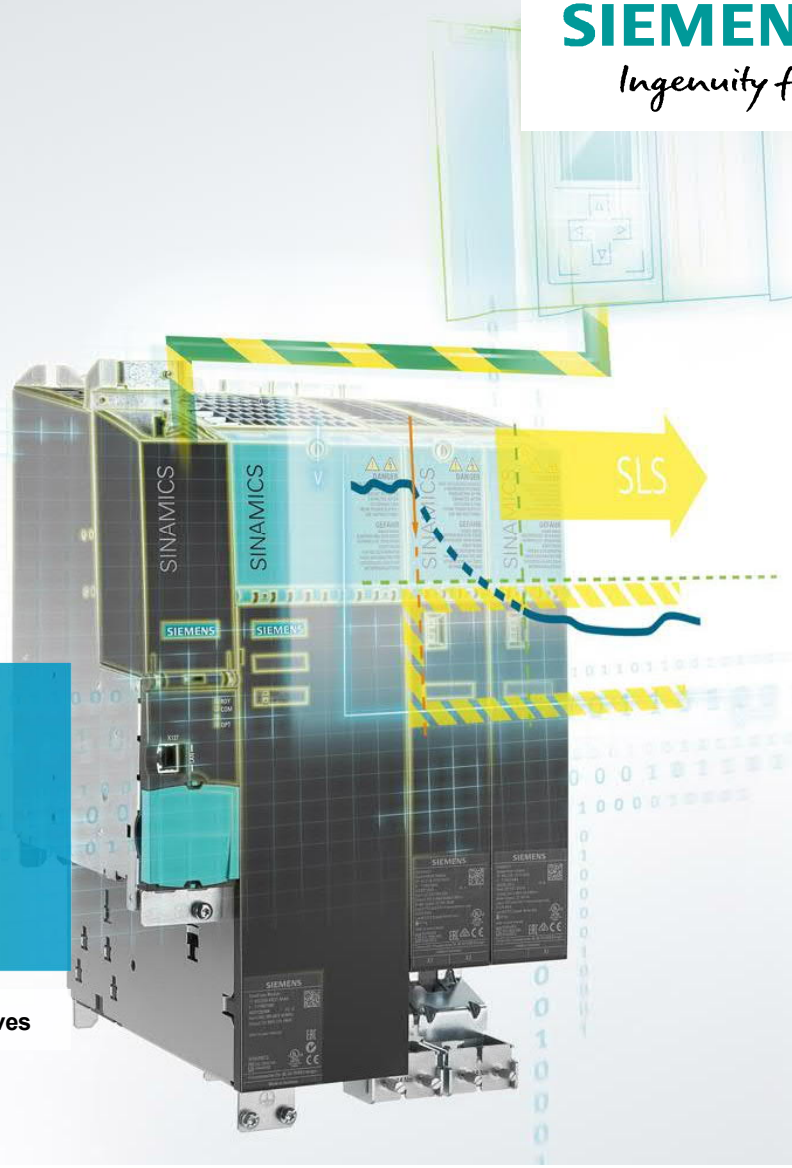
SINAMICS
Safety Integrated



siemens.com/safety-drives

Why safety?

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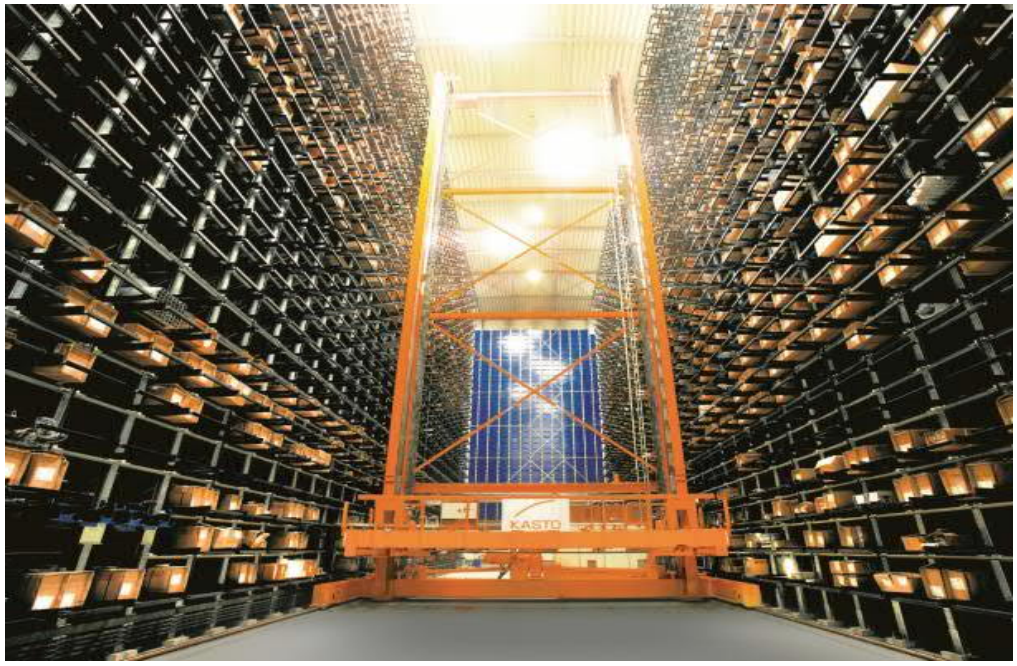
Introduction to Safety Integrated

Wherever human health and machine functionality need to be protected



Your advantages when using SINAMICS Safety Integrated

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Introduction to Safety Integrated

- Powerful safety concepts with short response times
- Simplified verification of machine safety according to ISO 13849 and EN 62061
- No additional hardware components required (contactors, safety relays, etc.)
- Lower wiring costs
- High degree of flexibility:
  Practical safety and operating concepts can be realized
- High degree of cost effectiveness:
  Reduction of hardware and installation costs
- Higher availability:
  Electromechanical switching elements that are prone to faults are eliminated

Certified according to

- IEC 61508
  SIL 2
- EN ISO 13849-1
  Cat. 3 and **PL d**

Your advantages when using SINAMICS Safety Integrated

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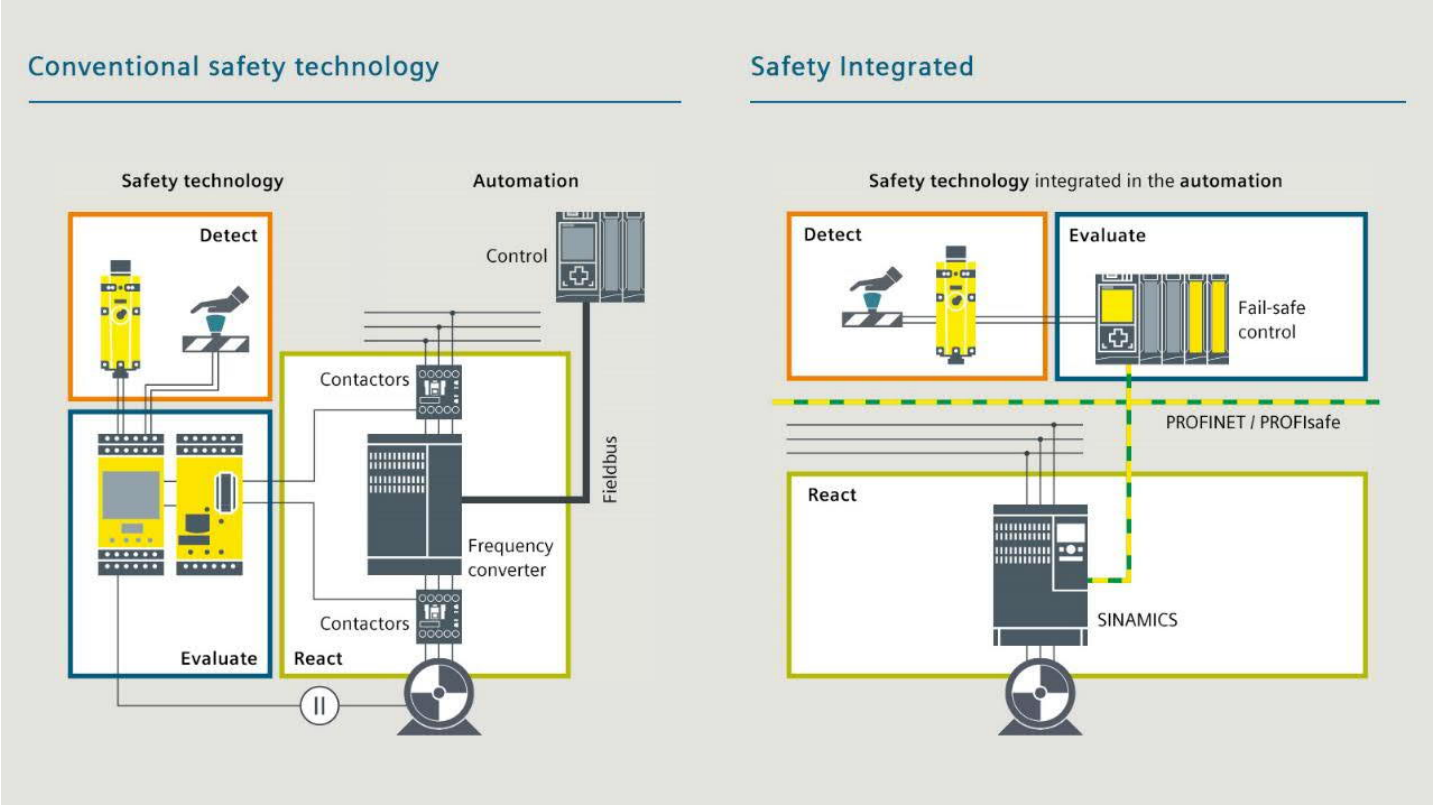
Introduction to Safety Integrated



Integrated Safety

- Less hardware
- Reduced wiring effort
- Perfect interaction of sensors, control and drives

SINAMICS Safety Integrated drives in the TIA Portal: The optimum converter for each and every application

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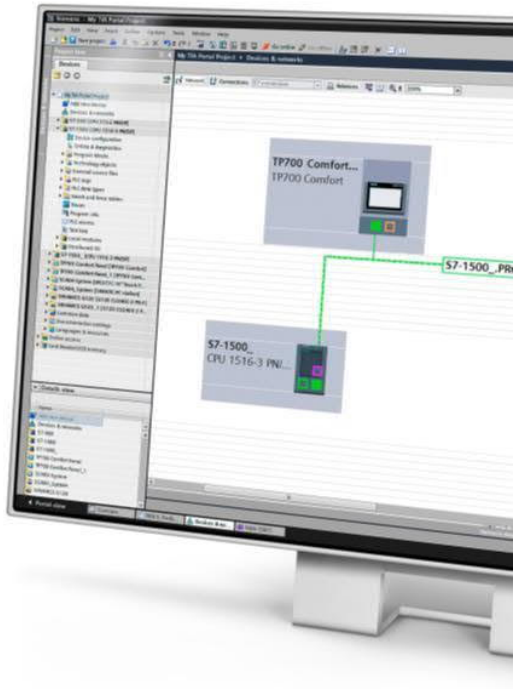
Introduction to Safety Integrated

SINAMICS G120 drive family		Converter system for general applications as well as distributed converter system for applications in conveyor technology
SINAMICS V90		Basis servo drive system for standard motion control applications
SINAMICS S210		Servo drive system with Safety Integrated, simple engineering, high dynamic performance and precision for machinery construction
SINAMICS S120 & Large Drives		Flexible and modular servo drive system over a wide range of power ratings for high-performance applications in the production industry



Overview according to EN 61800-5-2 functional safety
Fulfills: SIL 2, Cat. 3 and PL d

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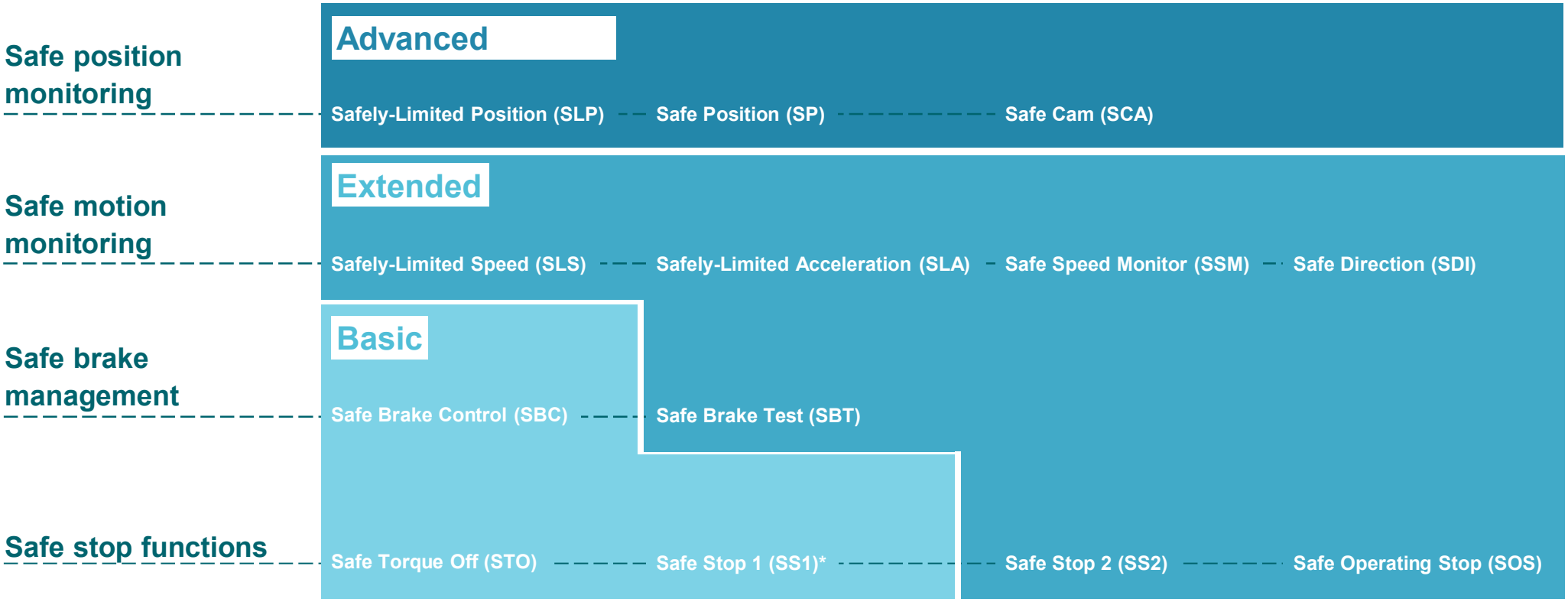
Overview of safety functions in the drive



SBT and SP go beyond the scope laid down in standard EN 61800-5-2.
*SS1 is available from the Basic Functions; additional differentiations are possible in SS1–t; -a -r

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

Safe stop functions
Safe Torque Off (STO)

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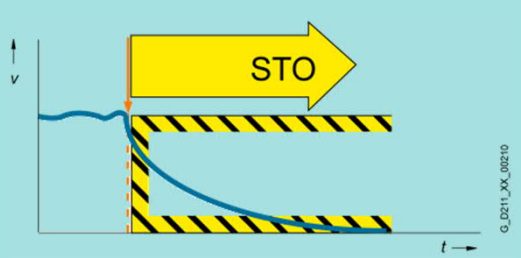
Overview of safety functions in the drive

Function



- Prevents torque-generating energy from being supplied to the motor
- Protects against automatic restart
- Fast restart is possible as the DC link remains charged

Application

Can be used in all plants, machines and systems with moving axes, e.g. conveyor technology

Customer benefits

- Allows work to be safely carried out with the protective door open (restart inhibit)
- Classic Emergency Stop with electromechanical power disconnection not required
- No wearing parts as shutdown is purely electronic
- The converter remains connected to the line supply – and can still be fully diagnosed

Safe stop functions
Safe Stop 1 (SS1)

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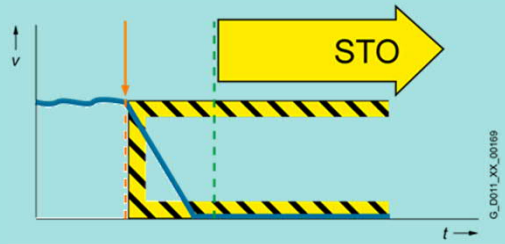
Overview of safety functions in the drive

Function



- The drive is electrically braked when SS1 is initiated
- This is followed by the torque-generating energy being safely shut down (STO)

Application

Fastest possible, safe braking of high inertia loads, e.g. saws, winders

Customer benefits

- Reduced stress on mechanical brakes as a result of the electrical braking
- Various versions (SS1-t,SS1-a,SS1-r)
- Complete drive group stopped in synchronism (SS1E)

Safe brake management
Safe Brake Control (SBC)

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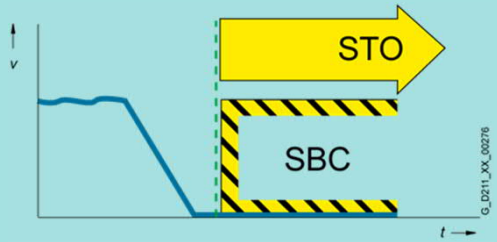
Overview of safety functions in the drive

Function



- Brakes that operate according to the closed-circuit principle can be safely controlled
- SBC is firmly coupled to STO

Application

For applications where a safe position must be maintained, even when the motor is in a quiescent current state, e.g. for vertical axes

Customer benefits

- Prevents suspended loads from sagging/falling
- No external logic or additional switching elements required
- Faults in the brake control are identified

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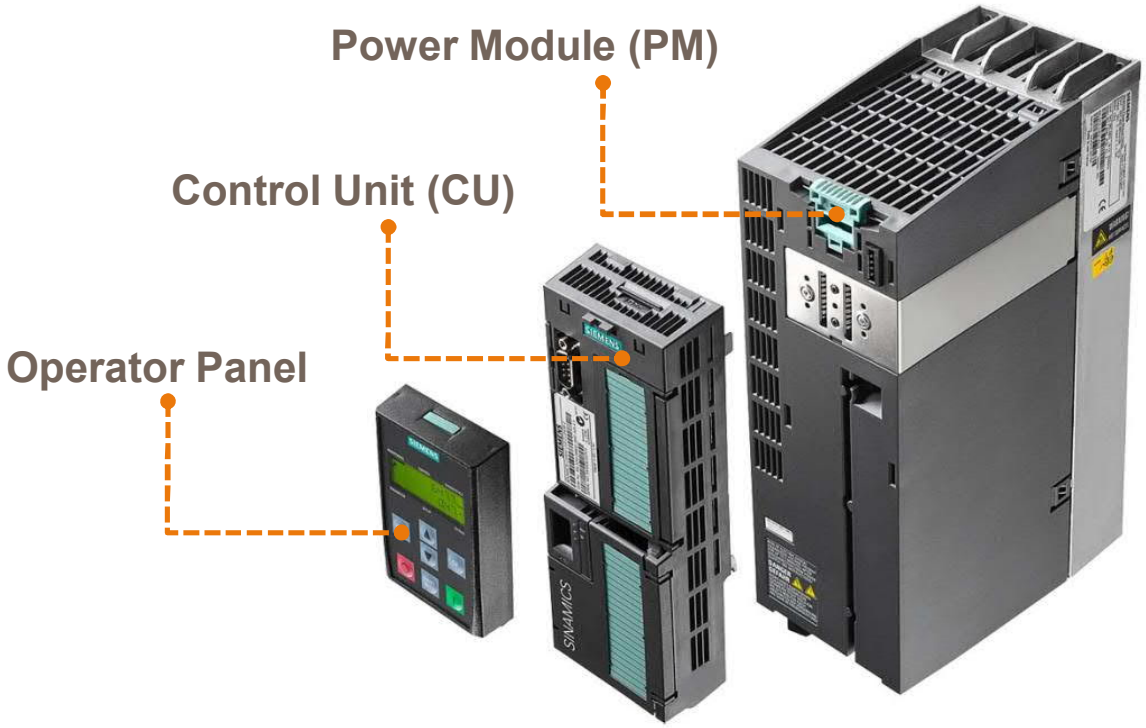
The modular concept

The G120 comprises three function units



SINAMICS G120
Components

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SINAMICS G120

PM240P-2/ PM230 IP20/IP20PT/IP55

PM240-2 / PM240 IP20

PM250 IP20

CU230P-2

CU240E-2

CU250S-2

BOP-2

IOP-2

SIRIUS ACT
Convinces with its flexible communication

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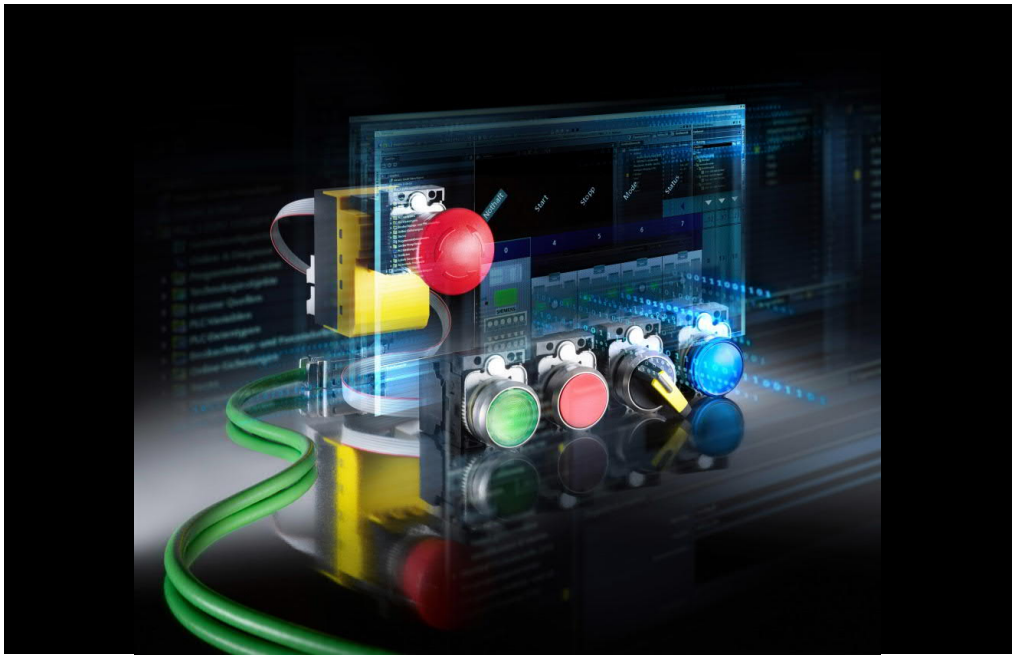
Flexible communication



Benefits

- Reduced wiring outlay and thus less sources of error during installation and commissioning
- High flexibility for modifications due to the modular and plug-in design
- Extended diagnostics and parameterization options resulting from integration in the TIA Portal
- Safety Integrated option:
  EMERGENCY STOP incorporated via PROFIsafe/ASIsafe communication
- Communication solution for PROFINET (control panel), IO-Link (enclosure solution/ID key-operated switch) and AS-i (enclosure solution/emergency stop connection for the control panel)

Reduce your wiring outlay through diverse communication solutions.

SIRIUS ACT
Performance in Action

Live Demo

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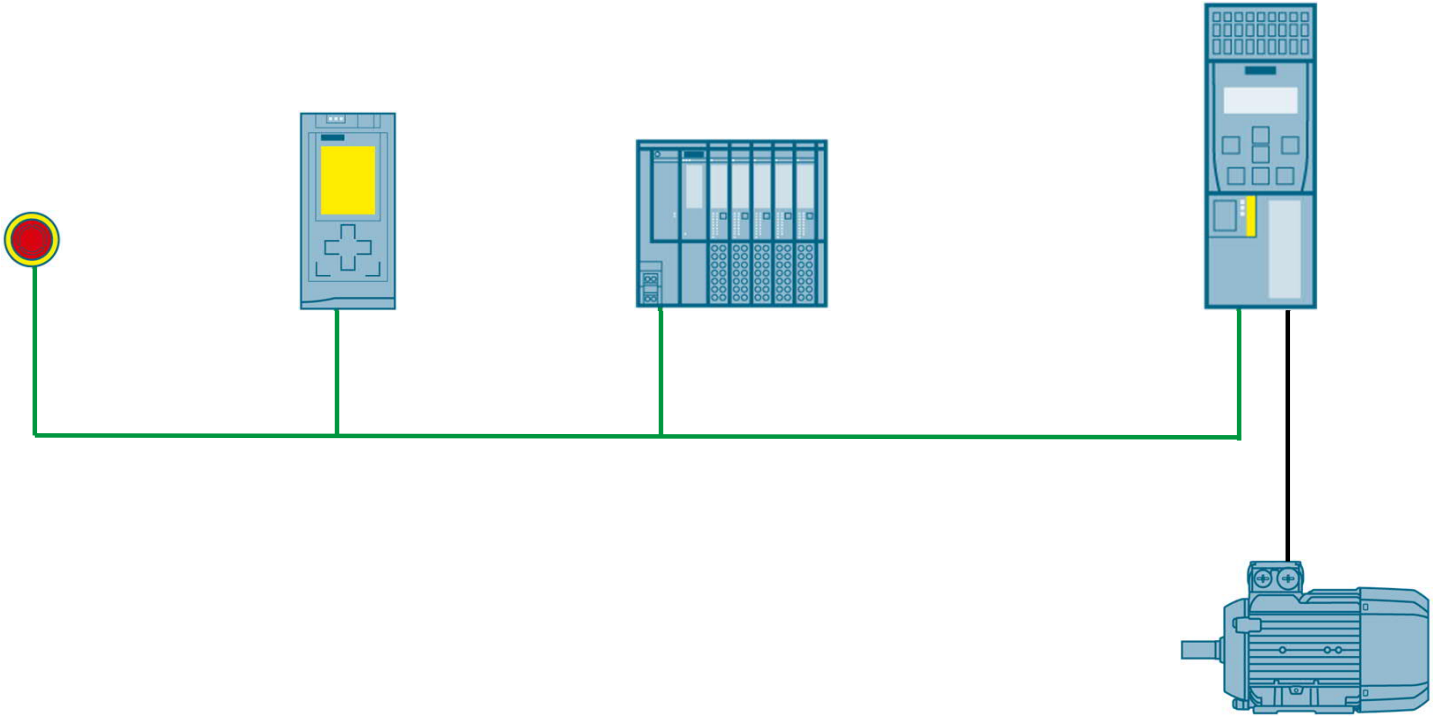

Controlling a SINAMICS G120 via PROFIsafe with a SIMATIC S7-1200 F-CPU
https://support.industry.siemens.com/cs/au/en/view/109746271

Thank you for your attention!

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Andrew Lau

Product Manager

DI MC GMC

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