

How Schneider Electric can help you comply with the new machine safety directive

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[Machines]

NOW!

Why safety?



Because human life is the most important value in a company!

New machines -

The European Machinery Directive

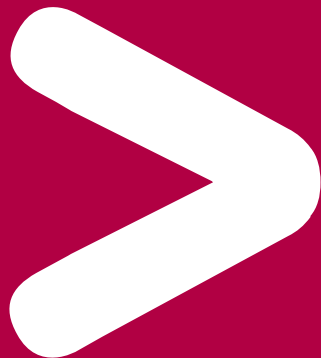
- Compliance with Machinery Directive is mandatory
 - Compliance with European harmonised standard give compliance with the related directive
- A new legal framework
 - New Machinery Directive



- New harmonised safety standards



How to achieve machine safety and meet safety standards?



With MachineStruxure solutions, simplifying machine safety

Simplifying machine safety



Helping you to determine easily your machine safety level required

Collaborating with you to implement the new functional safety standards based on the reliability of the components

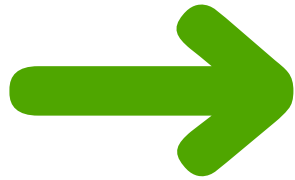


Certified safety chain Solutions from a market leader in automation

Safety function architectures certified by notify body (TÜV Nord) Can help you to simplify the determination of safety integrity (SIL) and performance (PL) levels

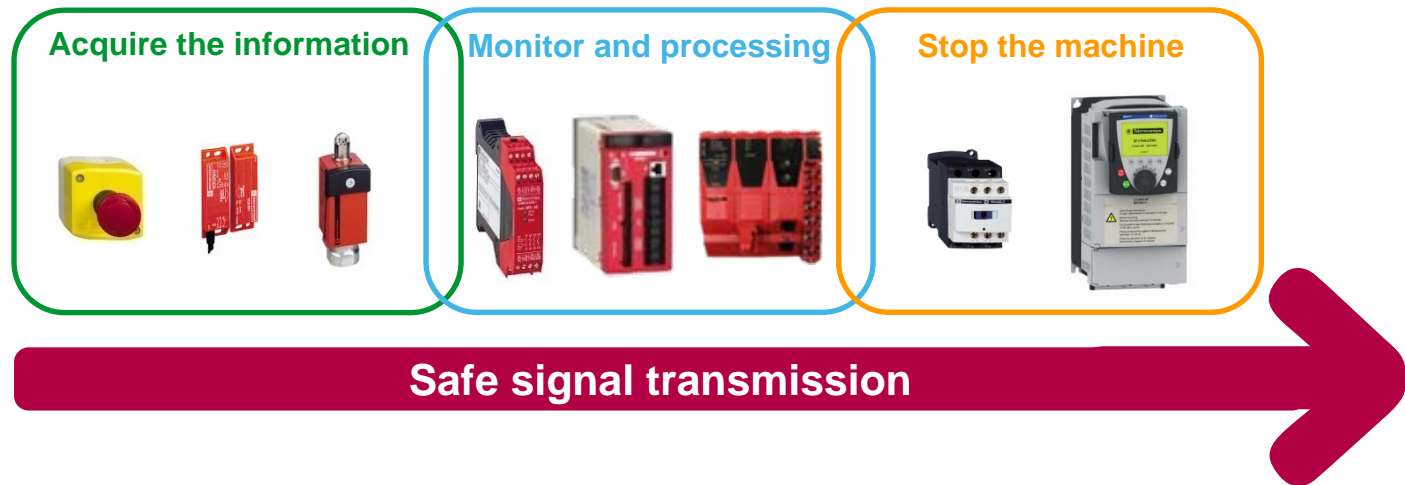


The 'Safety Chain' approach



One provider for the complete Safety chain

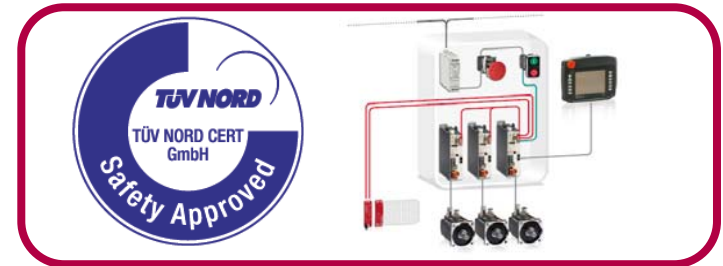
- Reduce time and cost on the safety machine application through a single automation and complete safety chain provider



What we have done to help you

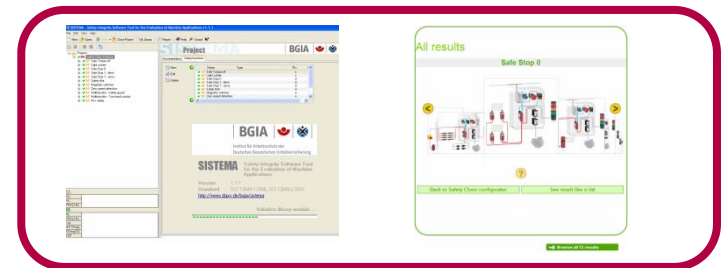
> Safety Chain Solutions

- 13 approved safety architectures to help you to start



> Calculation tool, libraries & Safety Chain Selector

- Free SISTEMA software (from IFA) with the our libraries included
- Online Safety Chain Selector



> Services

- Machine design support
- Local safety expertise
- Strong contacts to local certification bodies (e.g. TÜV)

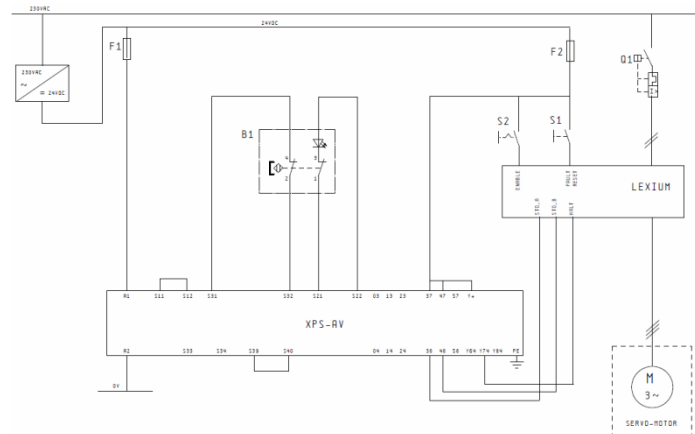
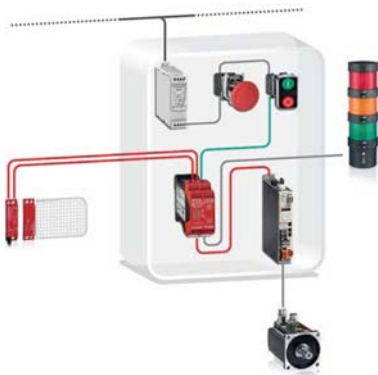


Safety Chain Solution www.infoPLC.net

- **The concept:**

- A combination of interoperating products to realize a safety function, which includes an approved principle diagram to save time and cost in obtaining the machine certificate according to the new European Machinery Directive

Safe Stop 1 (PL e, SIL 3)



Cycle time (s)	30
Number of hours operation per day (h)	12
Number of days operation per year	220
Number of operations per year (n _a)	319600



		Values	
		Channel 1	Channel 2
Input (magnetic switch) XCS	BTG (operations)	50 000 000	50 000 000
	TTFd (years)	150	150
	MTTF _r (years)	1578.3	1578.3
	MTTF _r resulting (years)	100	100
	PFH _r resulting (1/h)	2.47 x 10 ⁻²	2.47 x 10 ⁻²
DC (%)	99	99	
Logic (safety module) XPSAV	PFH _r (1/h)	7.95 x 10 ⁻²	7.95 x 10 ⁻²
Output (actuator) LXM32 servo-drive	MTTF _r (years)	1400	1400
	DC (%)	90	90
	PFH _r (1/h)	1 x 10 ⁻¹	1 x 10 ⁻¹
Safety function	MTTF _r (years)	30.1 (high)	
	DC (%)	96.3 (medium)	
	PFH _r resulting (1/h)	3.36 x 10 ⁻²	
	PL attained	e	
	SIL attained	3	



The 'Safety Chain Solution' files can be included like a reference in the technical documentation of your machine!

13 certified safety chain solutions

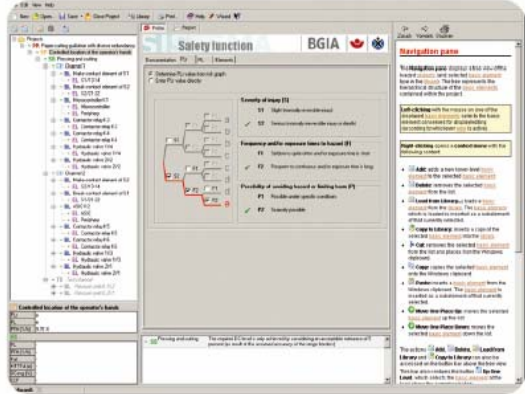
- Motor starter (PL c, SIL 1)
- Light curtain (PL c, SIL 1)
- Safe stop 1 (PL d, SIL 2)
- Safe stop 0 (PL e, SIL 3) High performance
- Safe stop 1 (PL d, SIL 2) Variable speed drive
- Safe stop 1 (PL e, SIL 3) High performance
- Safe stop 1 (PL e, SIL 3) Servo drive
- Safe stop 2 (PL e, SIL 3) Servo-enhanced safety
- Safety Mat (PL d, SIL 2)
- Magnetic switches (PL e, SIL 3)
- Zero speed detection (PL e, SIL 3)
- Multifunction (PL e, SIL 3) Safety guard
- Multifunction (PL e, SIL 3) Two hand control



NOW!

Simplifying EN ISO 13849-1 Standards

- **SISTEMA**, a free-to download software developed by German Institute for Occupational Health (IFA) to simplify the determination of the Performance Level (PL)
- Automated calculation of the reliability values with various levels of detail
- Saving time with Schneider Electric components library for SISTEMA
- Safety Chain Solutions can be reused like basic examples and to be adapted for your specific safety applications
- Print your summary and see the final results



SISTEMA software Interface

Step by Step instructions...

- Download [SISTEMA software](#) from the IFA website
- Install the SISTEMA software
- Download the [Schneider Electric library for SISTEMA](#)
- Open the Library file in the SISTEMA software

Safety Chain Solution selector

www.infoPLC.net

- Find easily the right safety function required
 - The machine safety selector is available in our website

1. What is the performance level required (PLr **) of the safety function on your machine ?

> ▾

2. What type of control of access to hazardous zones do you use ?

> ▾

3. How many different safety functions do you have on each machine ?

> ▾

4. Do you use an I/O field bus in your machine?

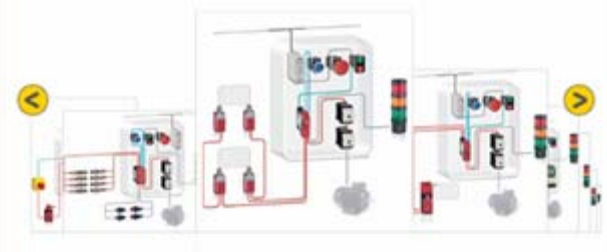
> ▾

5. What category of safety stop do you need? **

> ▾

All results

Safe Stop 0



[Back to Safety Chain configurator](#)

[See result like a list](#)

[→ Browse all 13 results](#)

Benefits



- > Certification easily obtained for your installation
- > Reduce design time by using our illustrative safety architectures
- > Minimise the risks of accidents and increase productivity

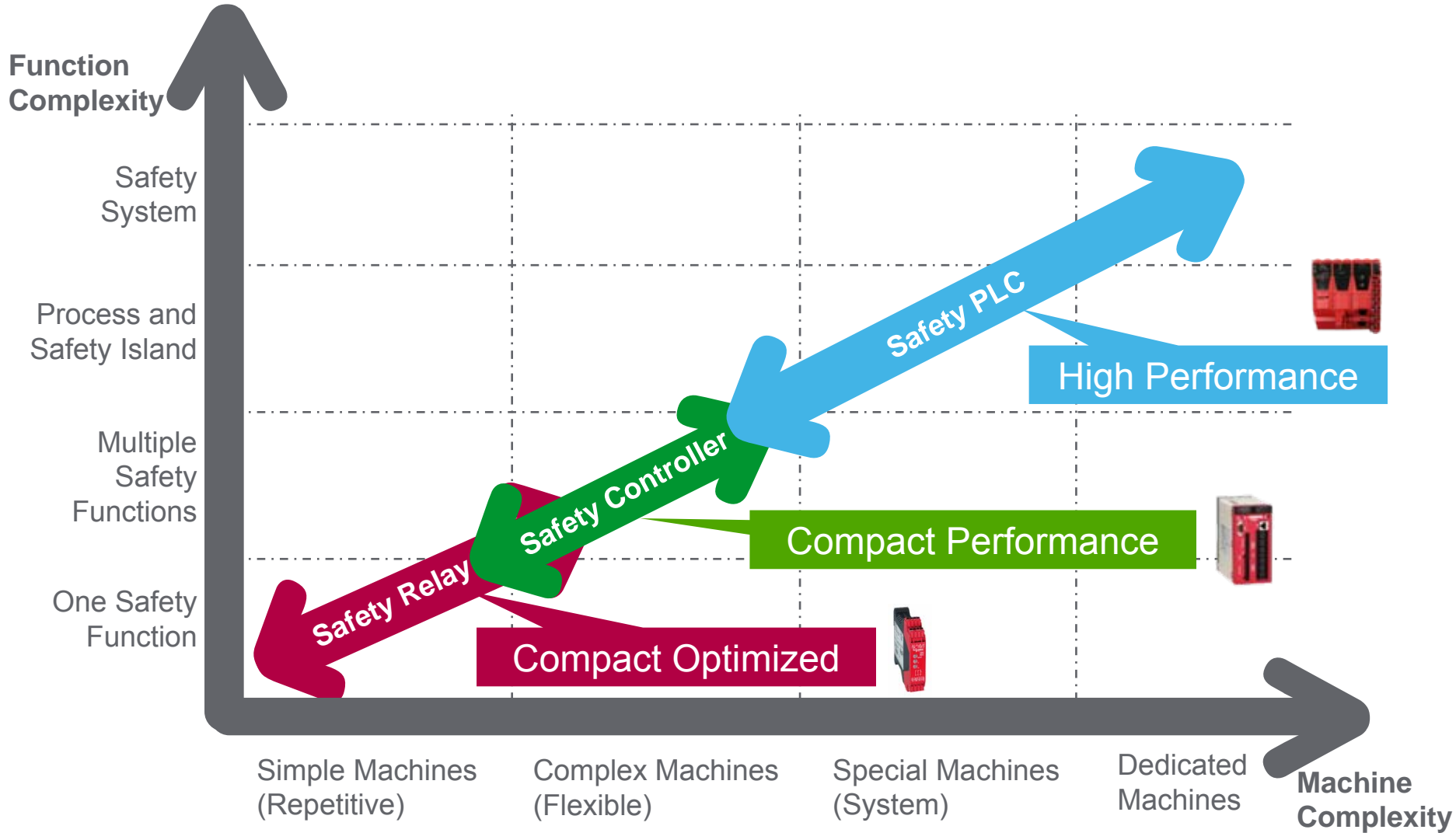


Approved
safety chain
solutions to
achieve the
safety level
required



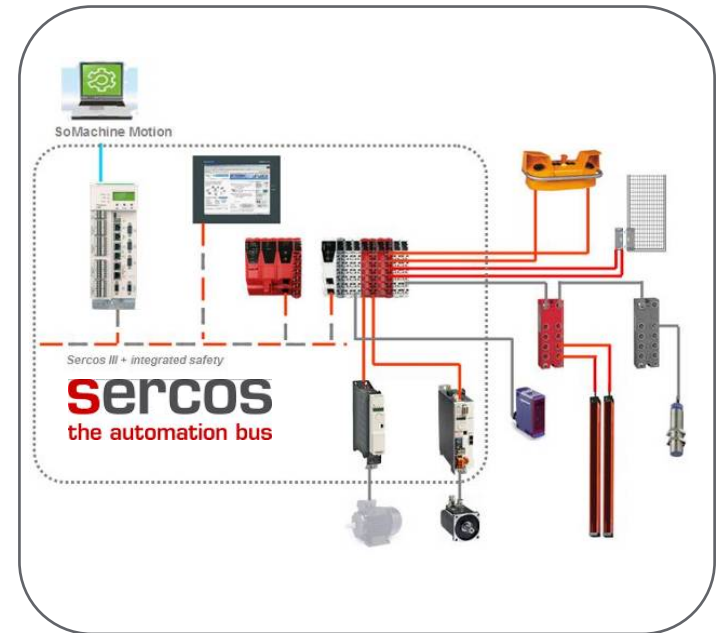
Our Certified Safety Chain Solutions cover 80% of the typical machine safety applications

Positioning of the Machine Safety Solutions



Integrated Safety Solution with PacDrive

- A combination of standard automation and machine safety. PacDrive system integrates the machine safety solution, with no additional wiring or safety bus.
 - Centralized management of safety configuration over single device.
 - Integrated software utility for development of standard and safety applications.
 - High performance level on machine diagnostics.
 - Minimization of machine stand-still time, Increase of flexibility and reduced wiring by distributed I/O.

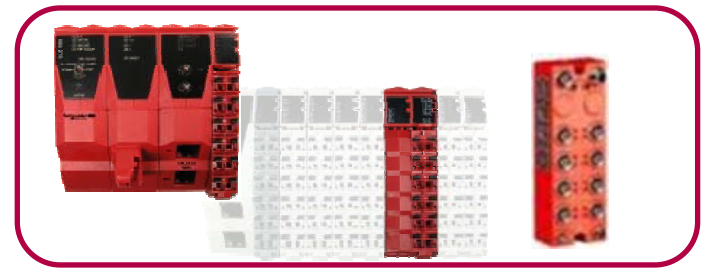


NOW!

High Performance Safety Offer

● Safety PLC and Safe I/Os:

- Safe PLC
 - PL e and SIL3
 - SERCOS III interface
- Safe I/O slices
 - IP20 and IP67
 - Combination of standard and safe I/Os



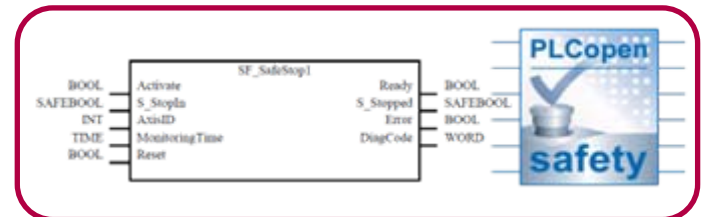
● Safety Tool:

- Embedded in SoMachine Motion
- Safety editor for Configuration, Programming, Diagnostic, Maintenance
- Engineering of machine and safety application



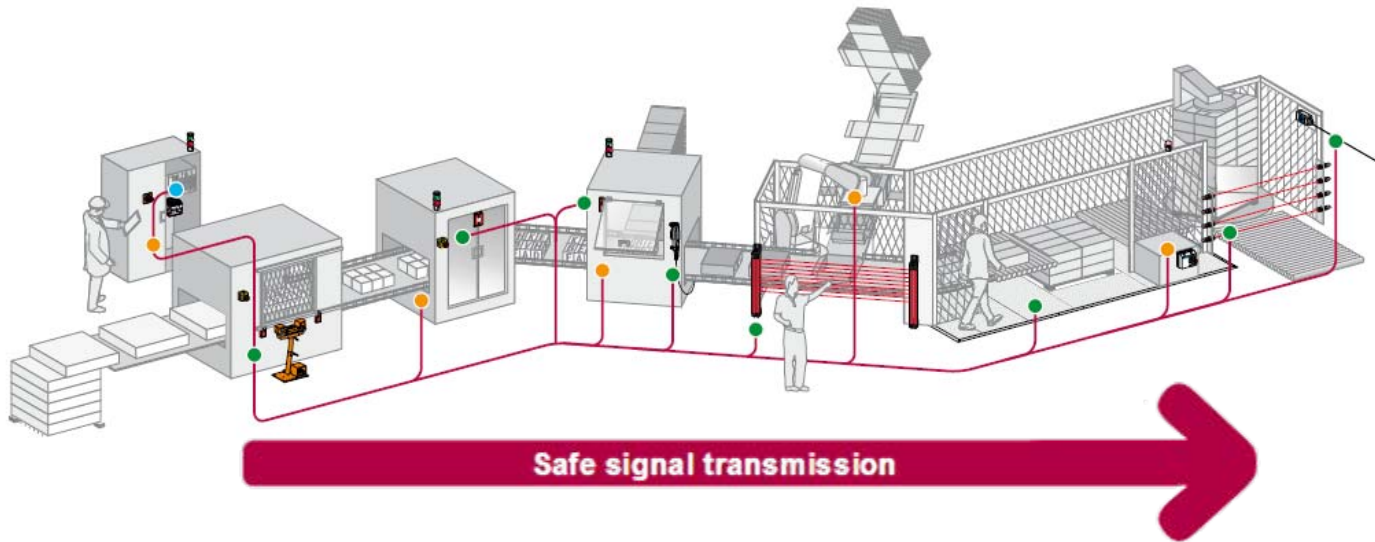
● Safety Libraries:

- PLCopen safety library
- Safe and standard data types
- Standard and safe logic function blocks



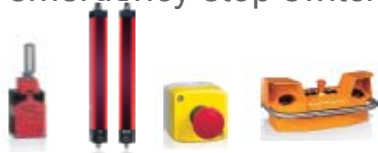
NOW!

One provider for the complete safety chain to save time and money



Acquire information

- Protective guard devices, light curtains, safety mats, two-hand control stations, switches, generic protection, and emergency stop switches



Monitoring and processing

- Safety relay modules, safety controllers, safety PLCs, AS-Interface safety at work



Stop the machine

- Contactors, variable speed and servo drives, rotary switch disconnectors



- > Build **safe**, **legal** and **efficient** machines
- Protect people
- Simplify machine safety
- Improve productivity

NOW!

Helping you to reach easily your safety machinery and standard level required

- Don't wait more to implement easily the new functional standards, we guide you step by step:

1

Machine Safety guide



[Learn about the changes in a comprehensive Machine safety guide](#)

2

Select the right safety chain solution



[Schneider Electric's safety chain solutions, approved by the TÜV to achieve the safety level required](#)

3

Evaluate the safety of your machine



[A software assistant tool for the Easy Application of the Control Standard EN ISO 13849-1](#)

NOW!
You know!