

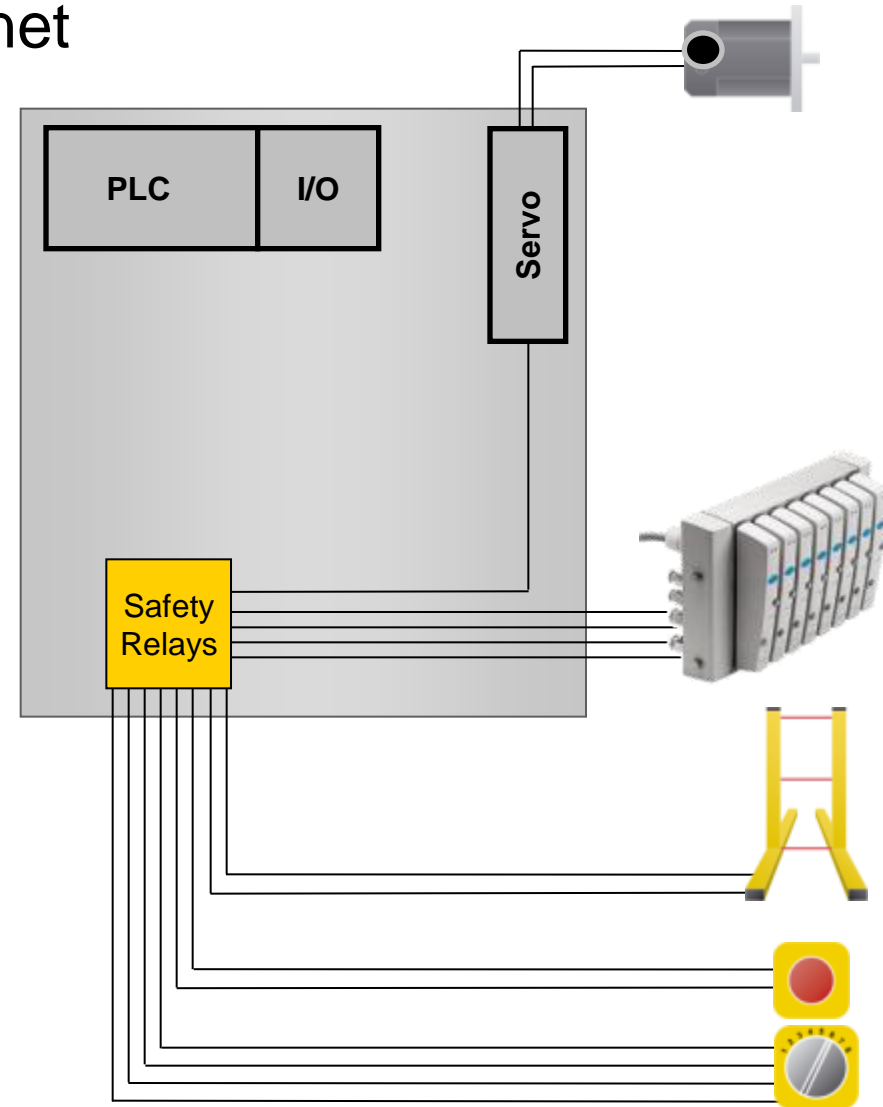
open 
SAFETY

open**SAFETY**

The open safety standard for all
communication protocols

What does Safety normally look like?

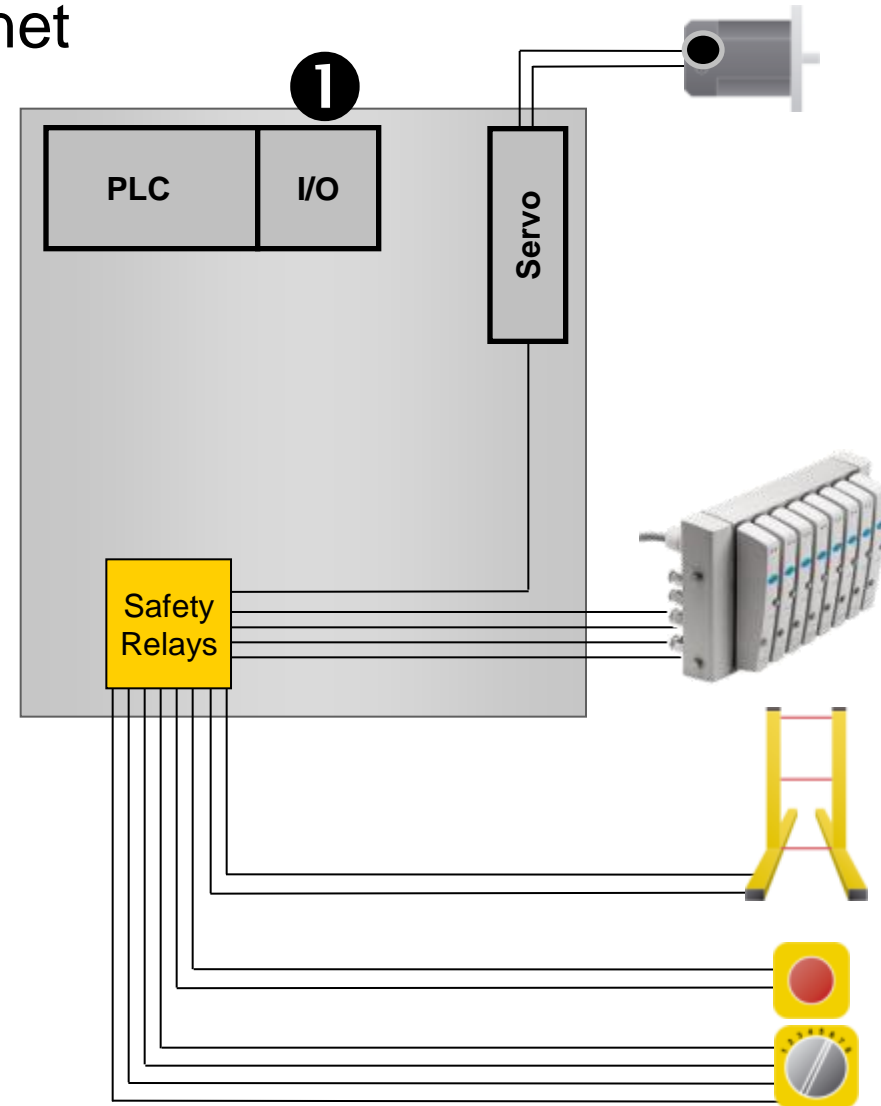
- Safety Relays within the cabinet
- Safety application by discrete wiring



What does Safety normally look like?

- Safety Relays within the cabinet
- Safety application by discrete wiring

① Additional DI/DO module

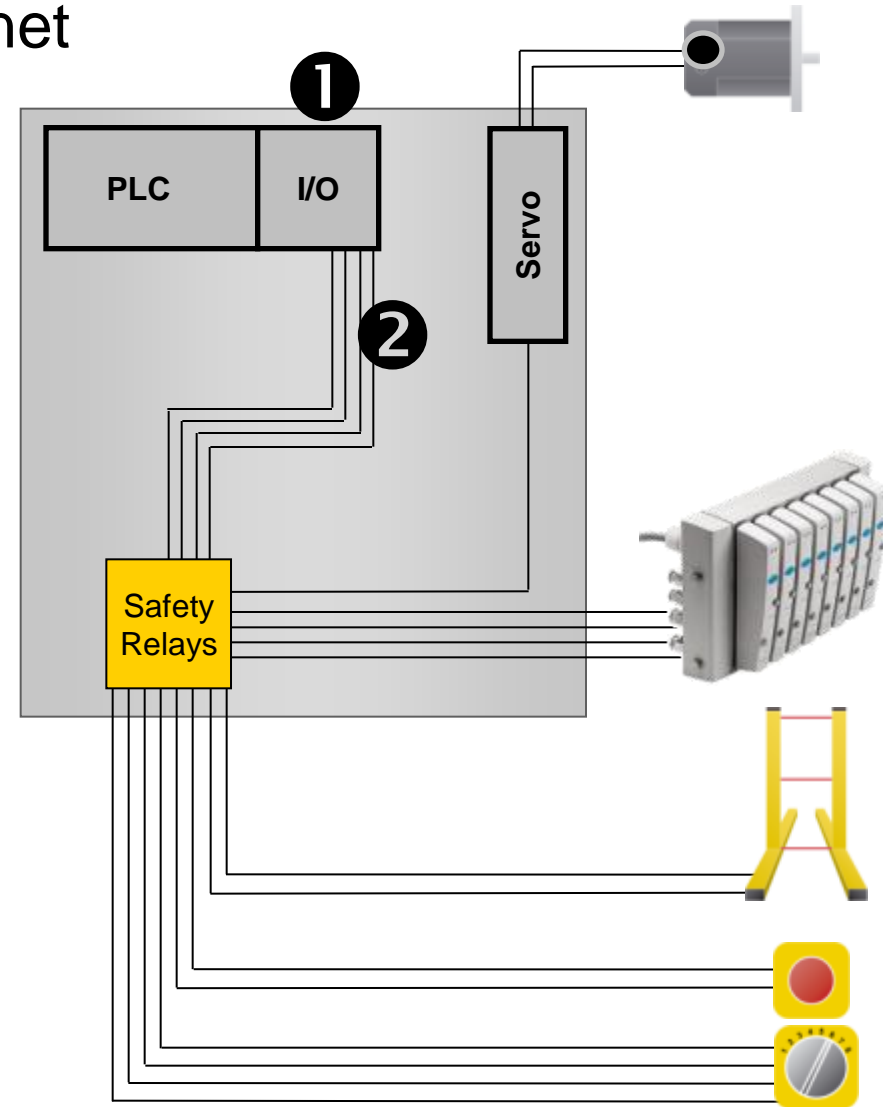


What does Safety normally look like?

- Safety Relays within the cabinet
- Safety application by discrete wiring

❶ Additional DI/DO module

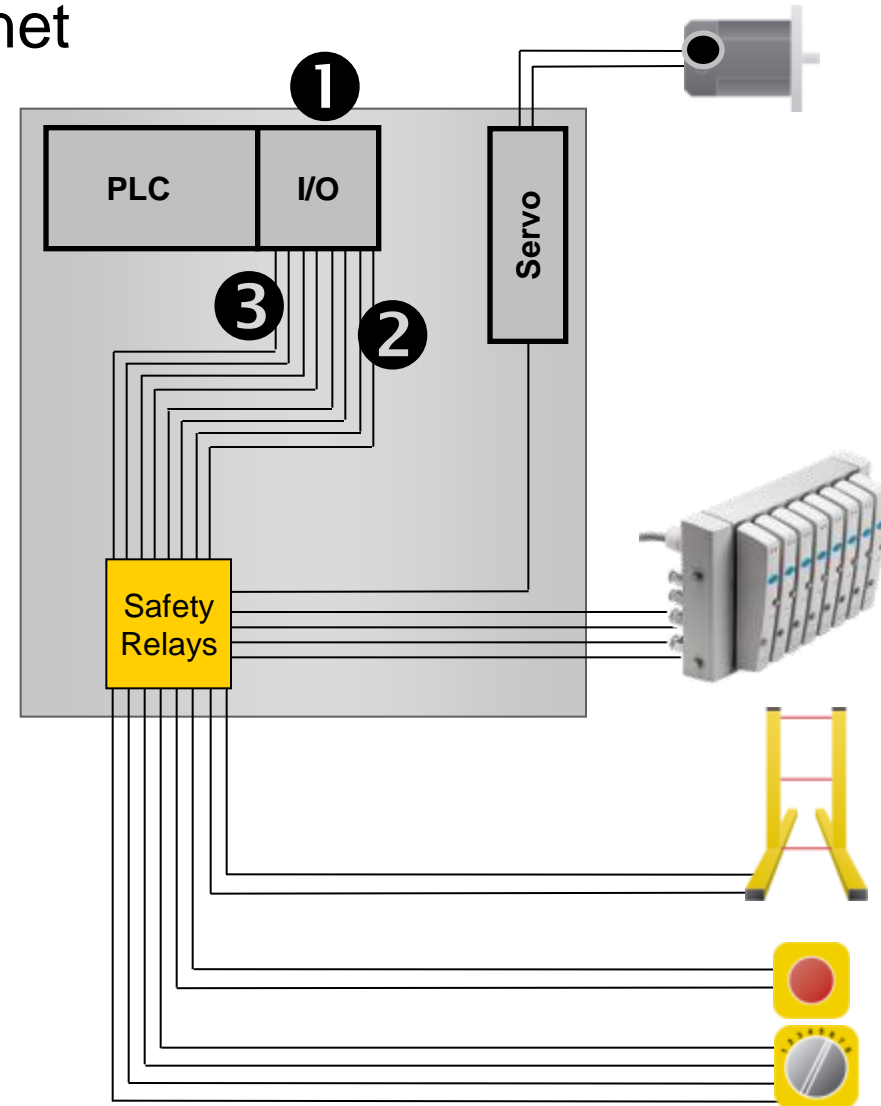
❷ Extra wiring of safe sensors



What does Safety normally look like?

- Safety Relays within the cabinet
- Safety application by discrete wiring

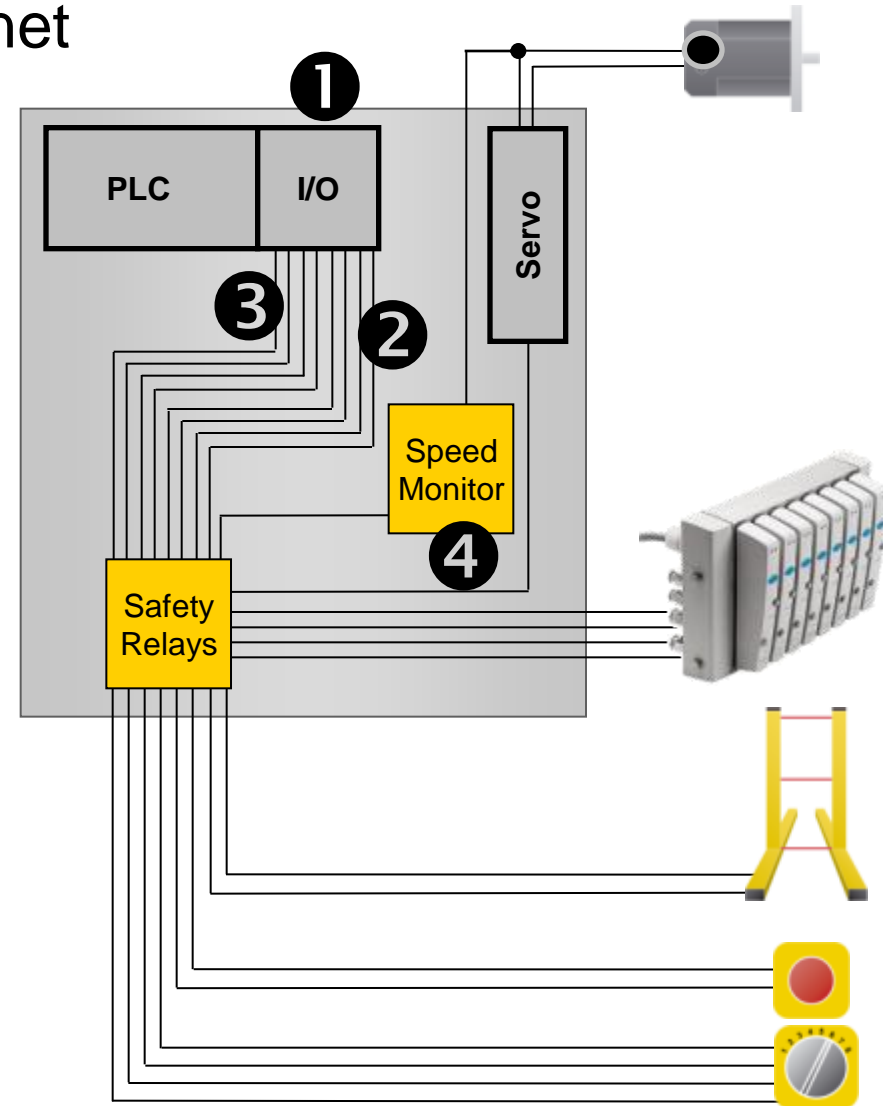
- ❶ Additional DI/DO module
- ❷ Extra wiring of safe sensors
- ❸ Extra wiring required to control safe actuators



What does Safety normally look like?

- Safety Relays within the cabinet
- Safety application by discrete wiring

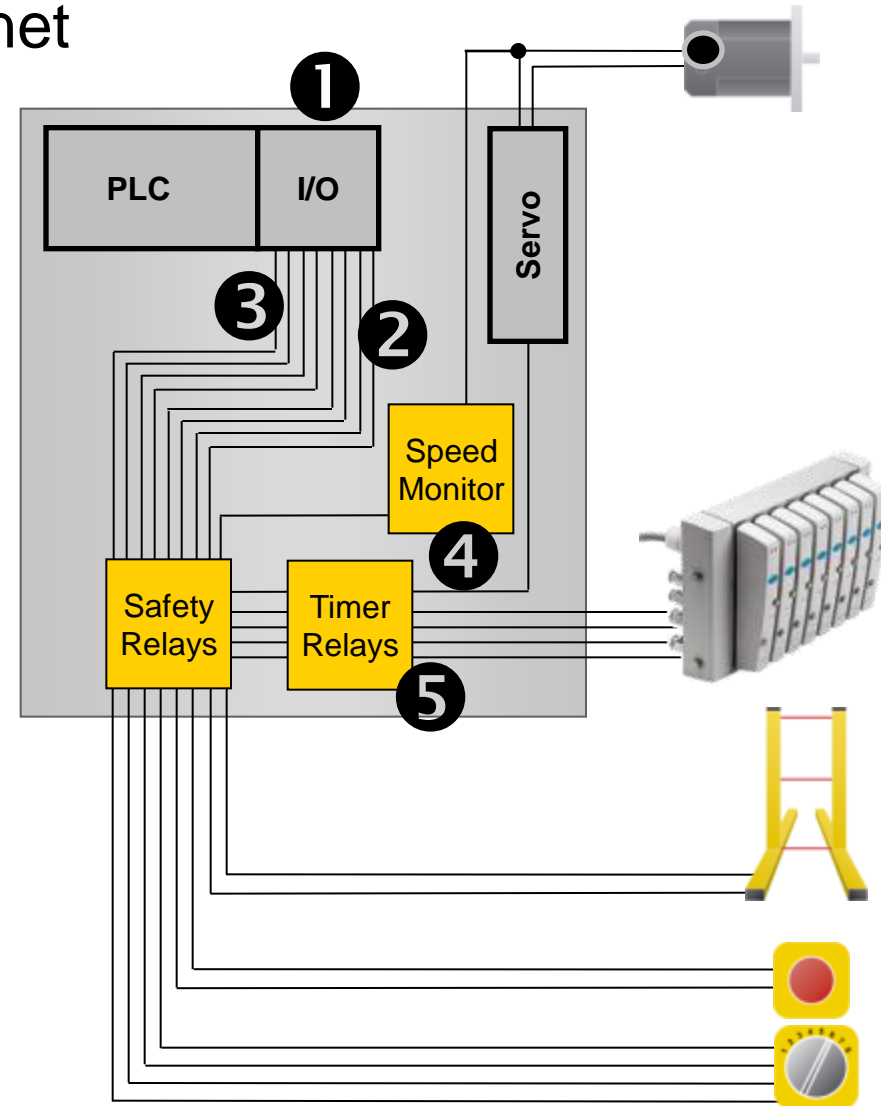
- ❶ Additional DI/DO module
- ❷ Extra wiring of safe sensors
- ❸ Extra wiring required to control safe actuators
- ❹ Extra speed monitor for safe motion control functions



What does Safety normally look like?

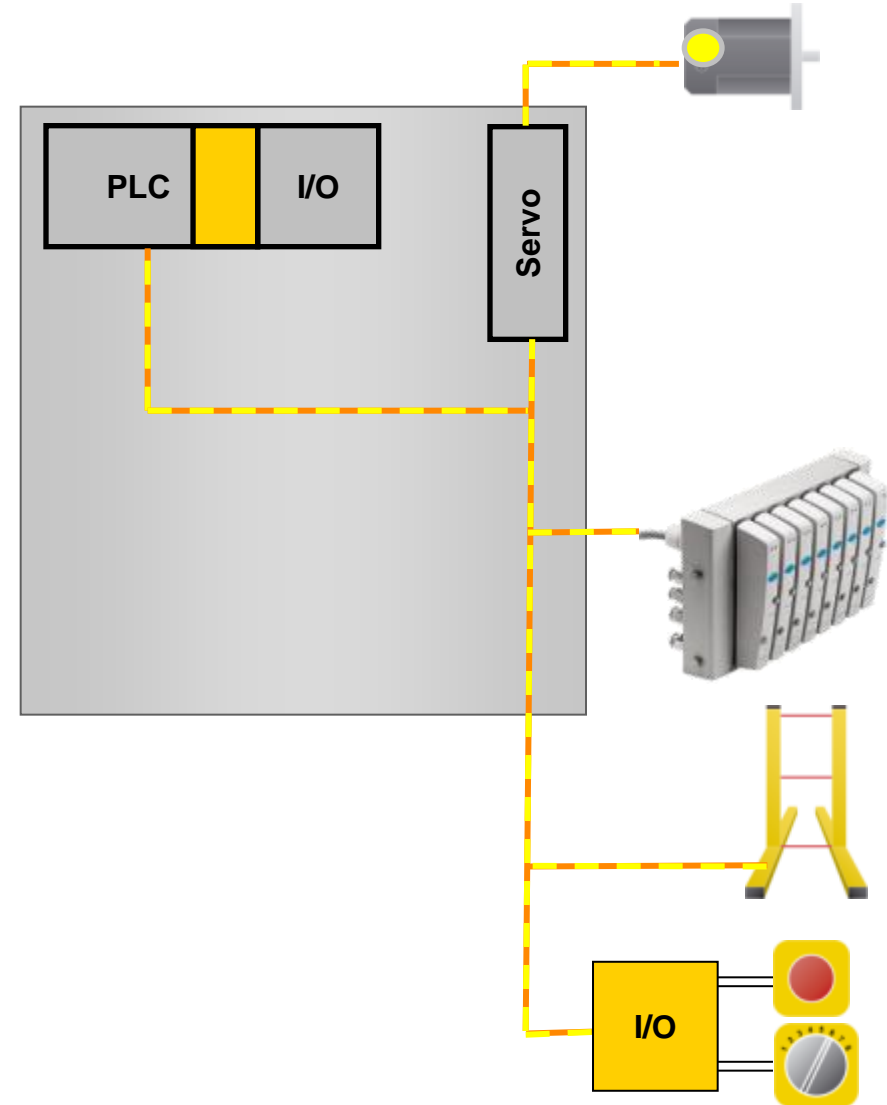
- Safety Relays within the cabinet
- Safety application by discrete wiring

- ➊ Additional DI/DO module
- ➋ Extra wiring of safe sensors
- ➌ Extra wiring required to control safe actuators
- ➍ Extra speed monitor for safe motion control functions
- ➎ Timer Relays for synchronous shutdown



What Safety should look like!

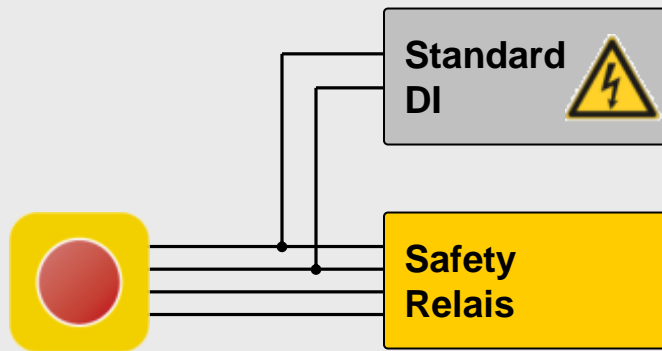
- Integrated
- Flexible
- Decentralized
- Certified



Benefit

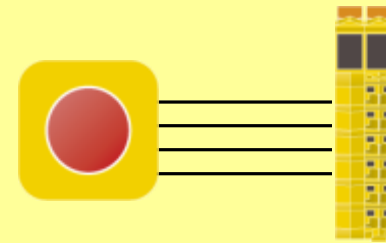
1

Hard-wired safety



- **Additional Wiring**
- **Failure of standard I/O's can affect safety**

Integrated safety



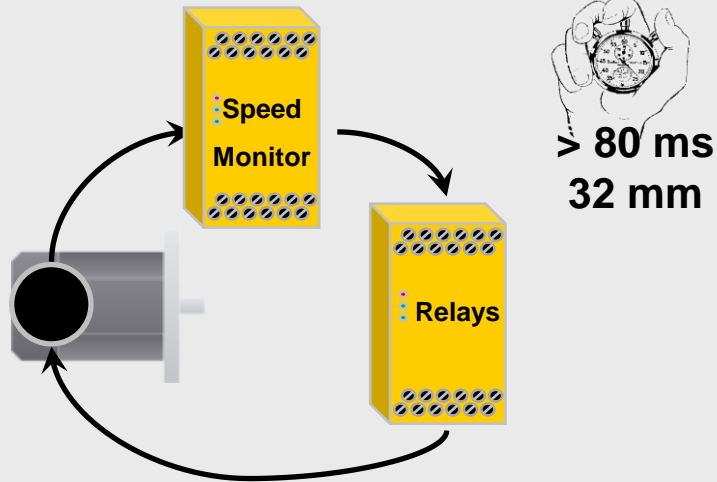
- **Less wiring**
- **Less components**

Decreased Response Time

Benefit

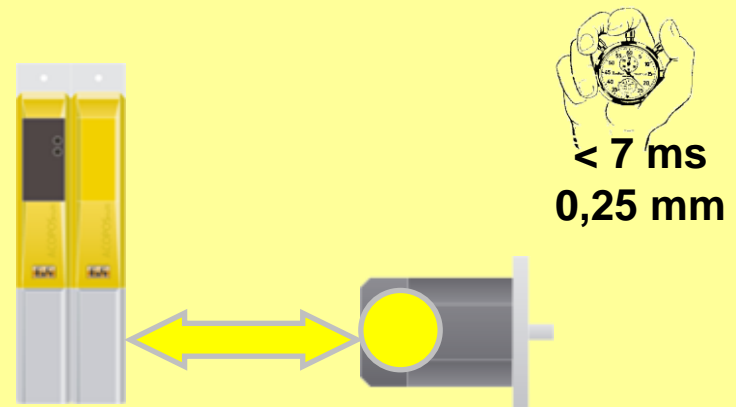
2

Hard-wired safety



- Latency induced by relays

Integrated safety



- Fastest reaction time
- Smaller footprint of machine

Elimination of Setup Errors

Benefit

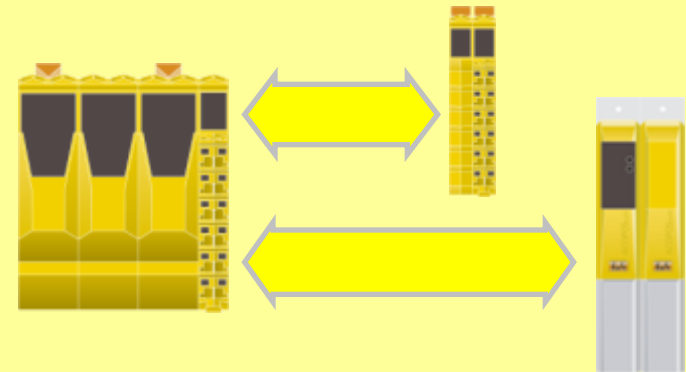
3

Hard-wired safety



- Significant risk of errors during maintenance

Integrated safety

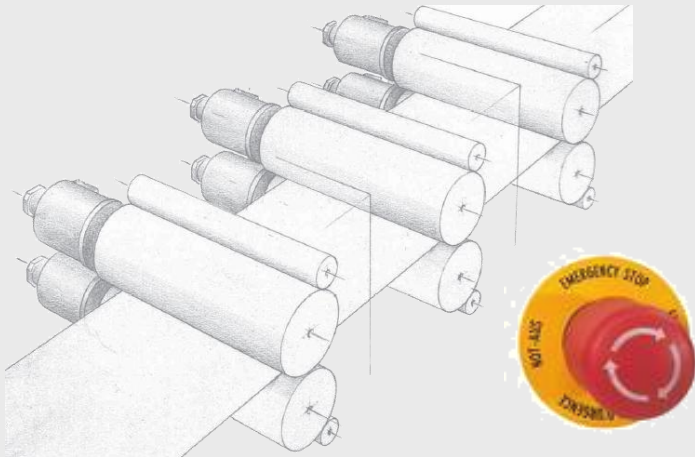


- Electronic data sheet
- Maintenance logging
- Password protection

Benefit

4

Hard-wired safety



- Only Safe Torque Off

Integrated safety

Function acc. IEC61800-5-2

STO – Safe Torque Off
STO1 – Safe Torque Off one channel
SBC – Safe Brake Control
SS1 – Safe Stop 1
SS2 – Safe Stop 2
SOS – Safe Operating Stop
SLS – Safely Limited Speed
SDI – Safe Direction
SLI – Safely Limited Increment
SMS – Safe Maximum Speed

- Intelligent safe motion functions

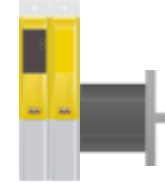
- Available Safety Protocols
 - ProfiSafe is **limited** to Profibus and Profinet
 - CIPSafety is **limited** to Rockwell protocols and SERCOS
 - Safety EtherCAT is **limited** to EtherCAT
 - Safety Net p is a **proprietary** protocol from PILZ

- Available Safety Protocols
 - ProfiSafe is **limited** to Profibus and Profinet
 - CIPSafety is **limited** to Rockwell protocols and SERCOS
 - Safety EtherCAT is **limited** to EtherCAT
 - Safety Net p is a **proprietary** protocol from PILZ
- These protocols are **proprietary** or **limited** to a certain Fieldbus!

- Available Safety Protocols
 - ProfiSafe is **limited** to Profibus and Profinet
 - CIPSafety is **limited** to Rockwell protocols and SERCOS
 - Safety EtherCAT is **limited** to EtherCAT
 - Safety Net p is a **proprietary** protocol from PILZ
- These protocols are **proprietary** or **limited** to a certain Fieldbus!
- These technologies are **NOT** compatible with each other!

- Available Safety Protocols
 - ProfiSafe is **limited** to Profibus and Profinet
 - CIPSafety is **limited** to Rockwell protocols and SERCOS
 - Safety EtherCAT is **limited** to EtherCAT
 - Safety Net p is a **proprietary** protocol from PILZ
 - openSAFETY is **open** and available for **any fieldbus**
- openSAFETY is fully **open** and totally **independent** of the fieldbus!

Black channel mechanism

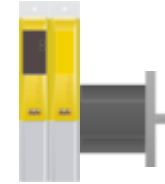


Black channel mechanism



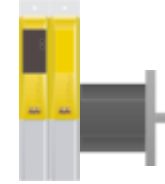
Black channel mechanism

open SAFETY



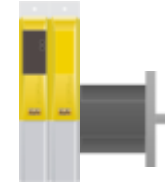
open SAFETY

Black channel mechanism



open SAFETY

Black channel mechanism



open SAFETY

Black channel mechanism



open SAFETY

Any fieldbus



POWERLINK

Modbus

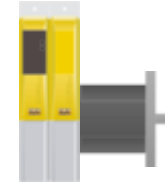
SERCOS

EtherNet/IP

PROFINET

Black channel mechanism

open SAFETY



open SAFETY



Any fieldbus



POWERLINK

Modbus

SERCOS

EtherNet/IP

PROFINET

Black channel mechanism



open SAFETY



Any fieldbus



POWERLINK

Modbus

SERCOS

EtherNet/IP

PROFINET

Black channel mechanism

open SAFETY



open SAFETY



Any fieldbus

POWERLINK Modbus SERCOS EtherNet/IP PROFINET

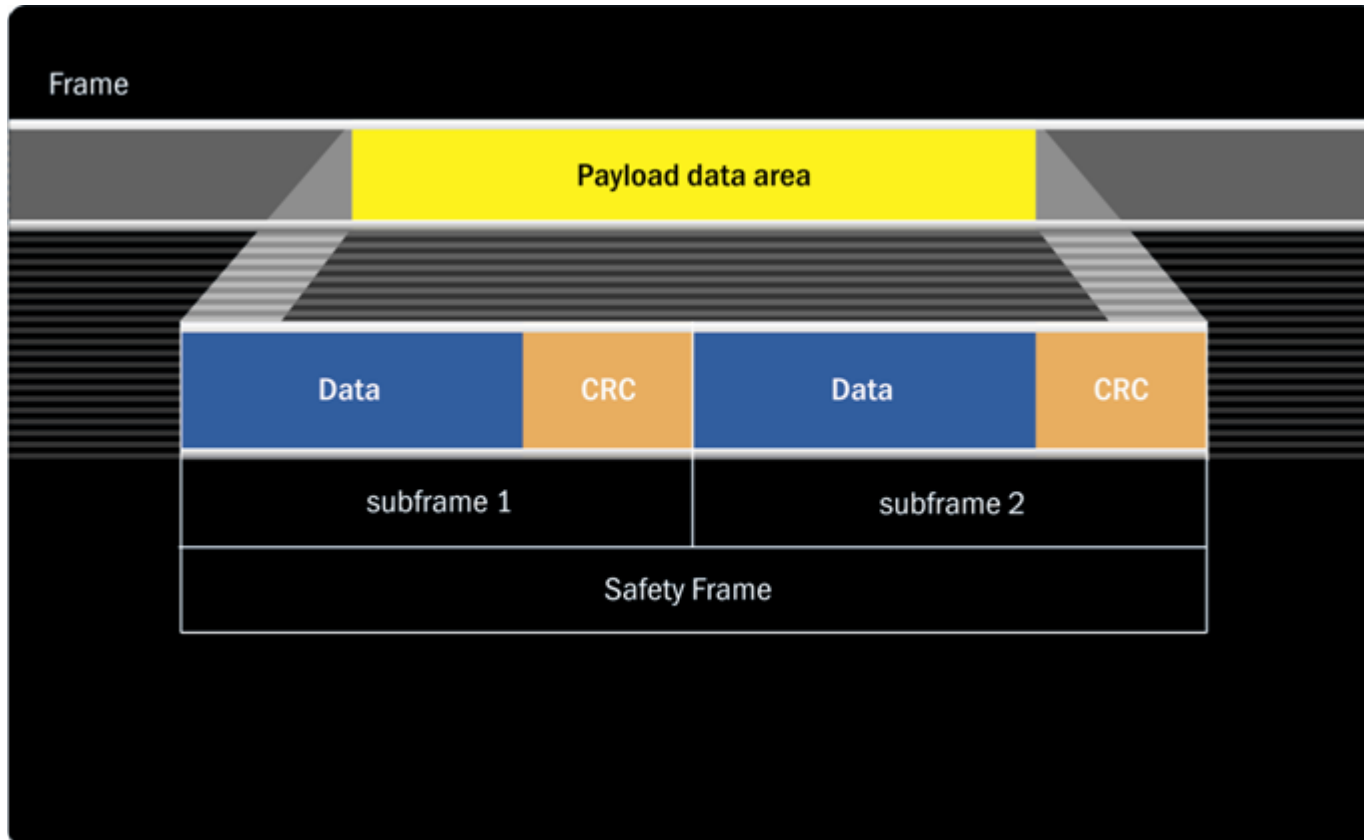
Errors and preventive/corrective measures

- No faults go undetected!

Preventive/corrective measures

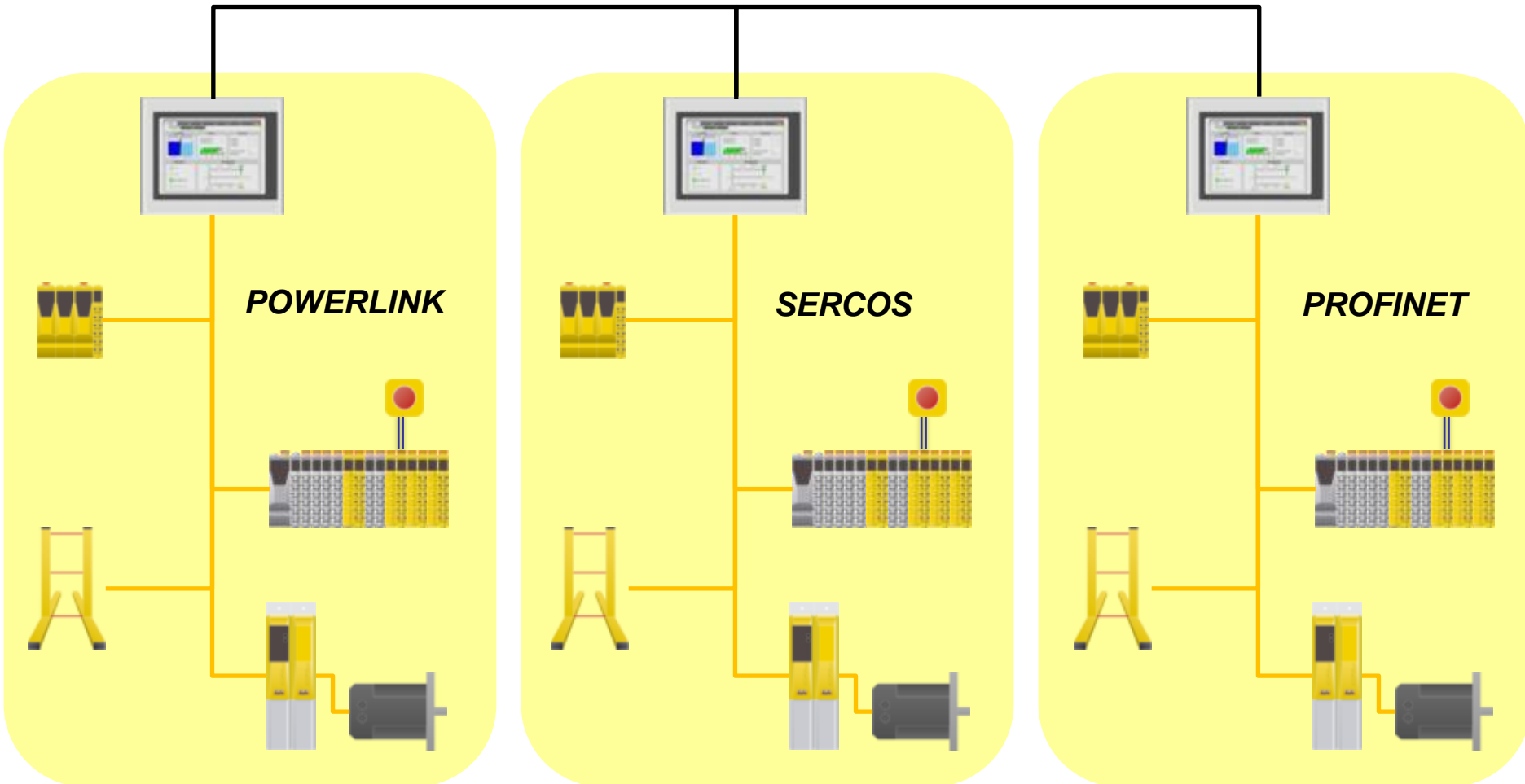
Faults	Time stamp	Time monitoring	Identifier	CRC Protection	Redundancy with cross-checks	Distinct frame structures
Duplication	Blue					
Loss		Green				
Insertion			Blue			
Incorrect sequence	Blue					
Delay	Blue	Green				
Distortion				Blue	Orange	
Mix-up of standard and Safety Frames						Green

- The frame consists of two sub frames and is able to transport data up to 254 bytes of payload data



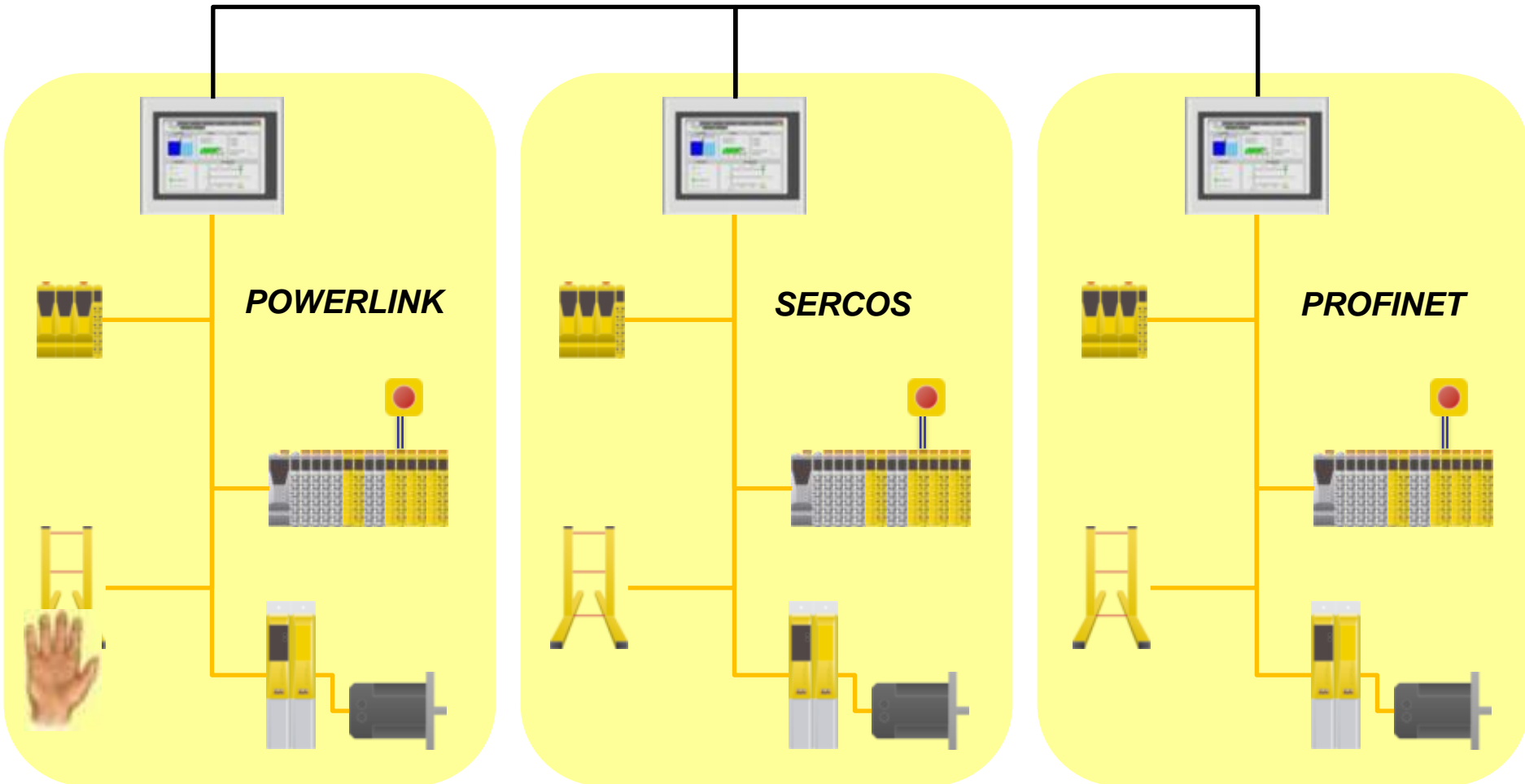
One standard for all networks

EtherNet/IP



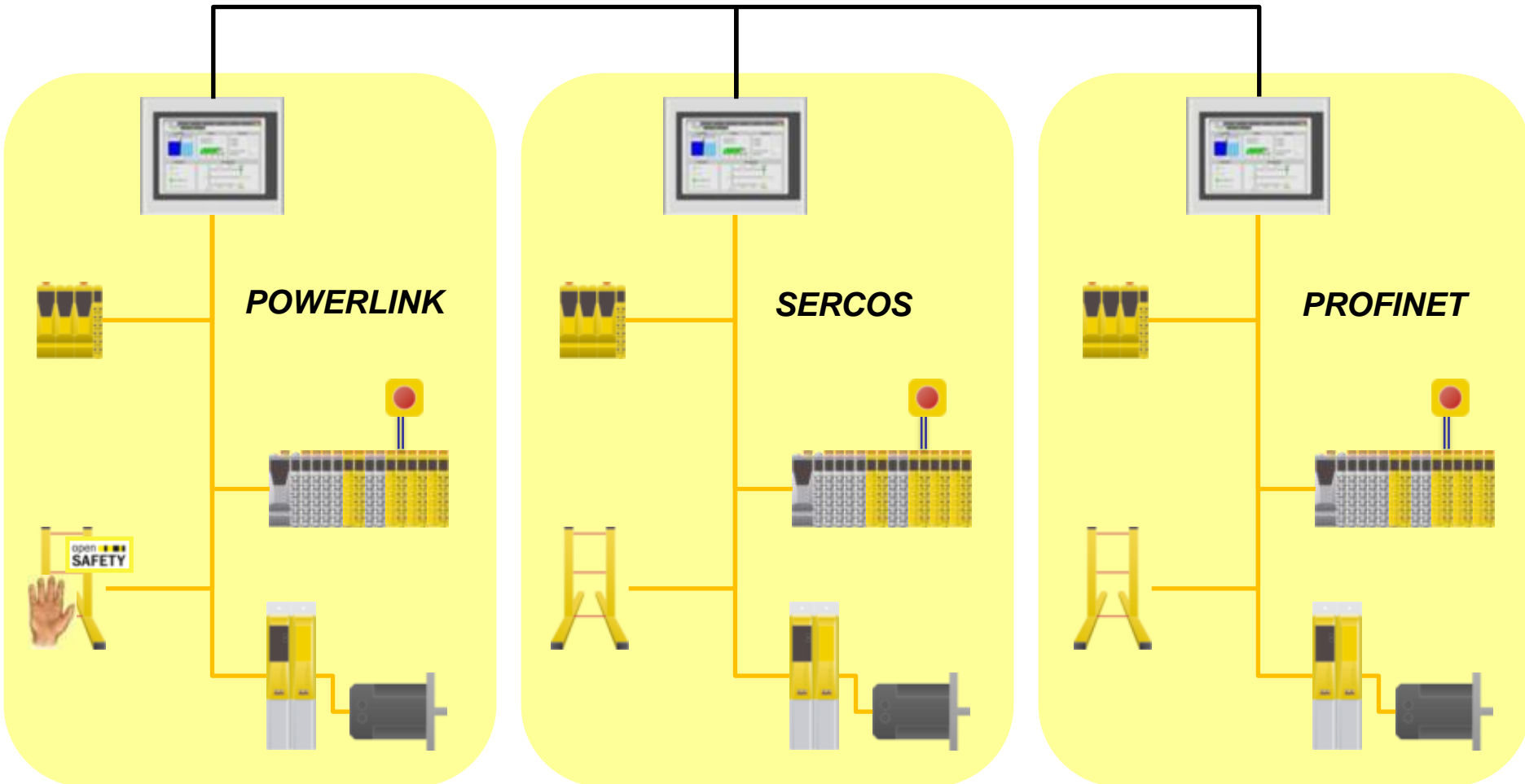
One standard for all networks

EtherNet/IP



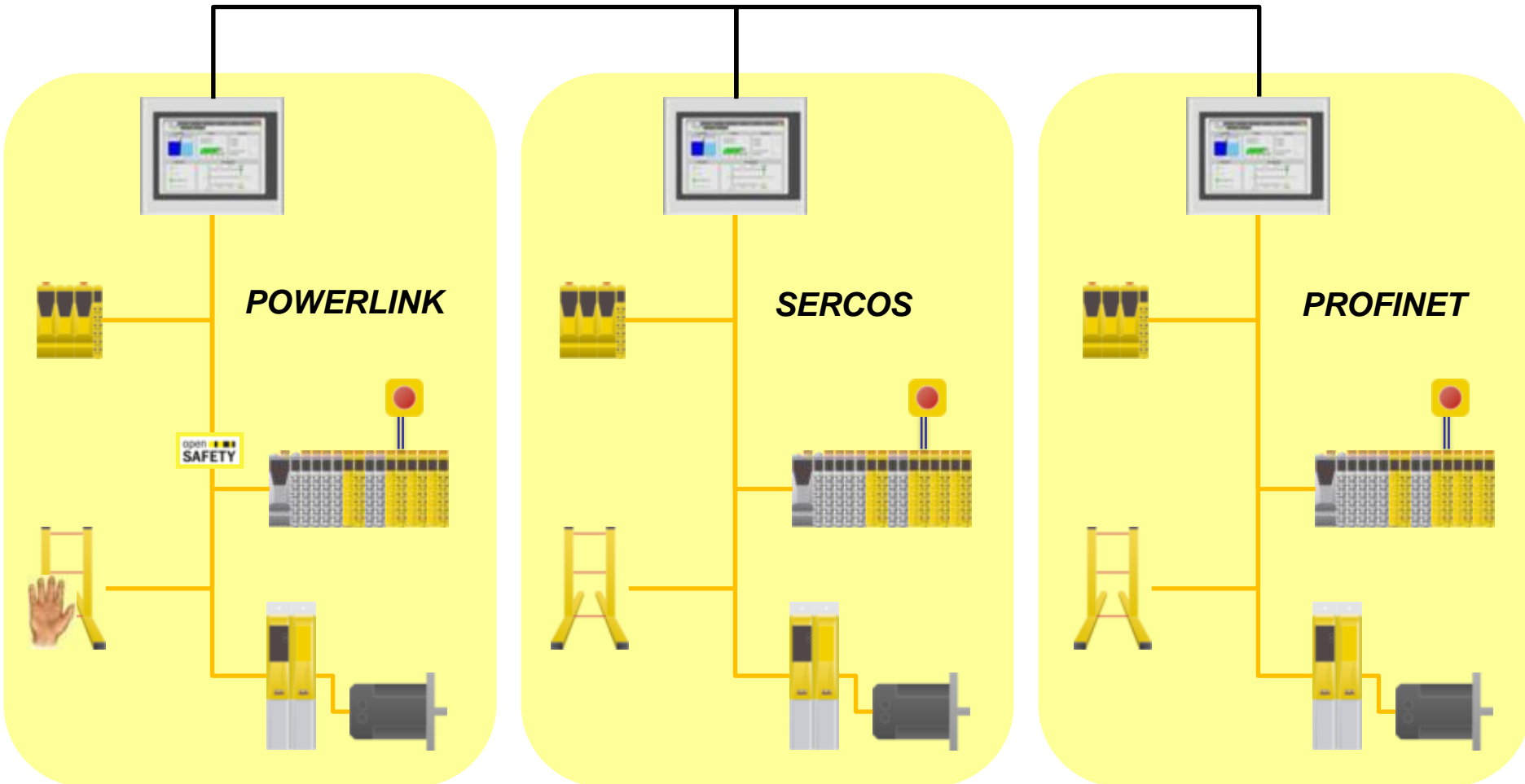
One standard for all networks

EtherNet/IP



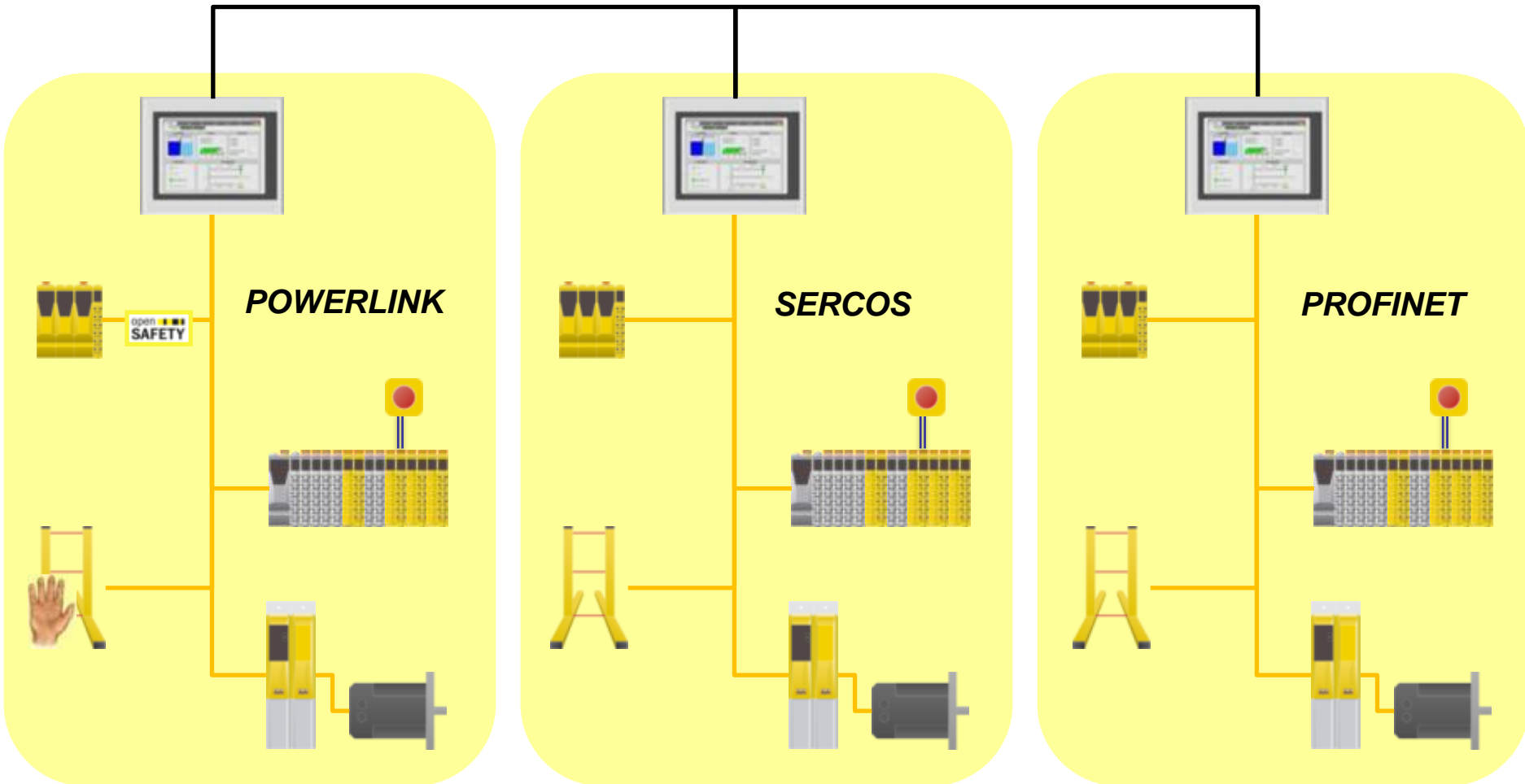
One standard for all networks

EtherNet/IP



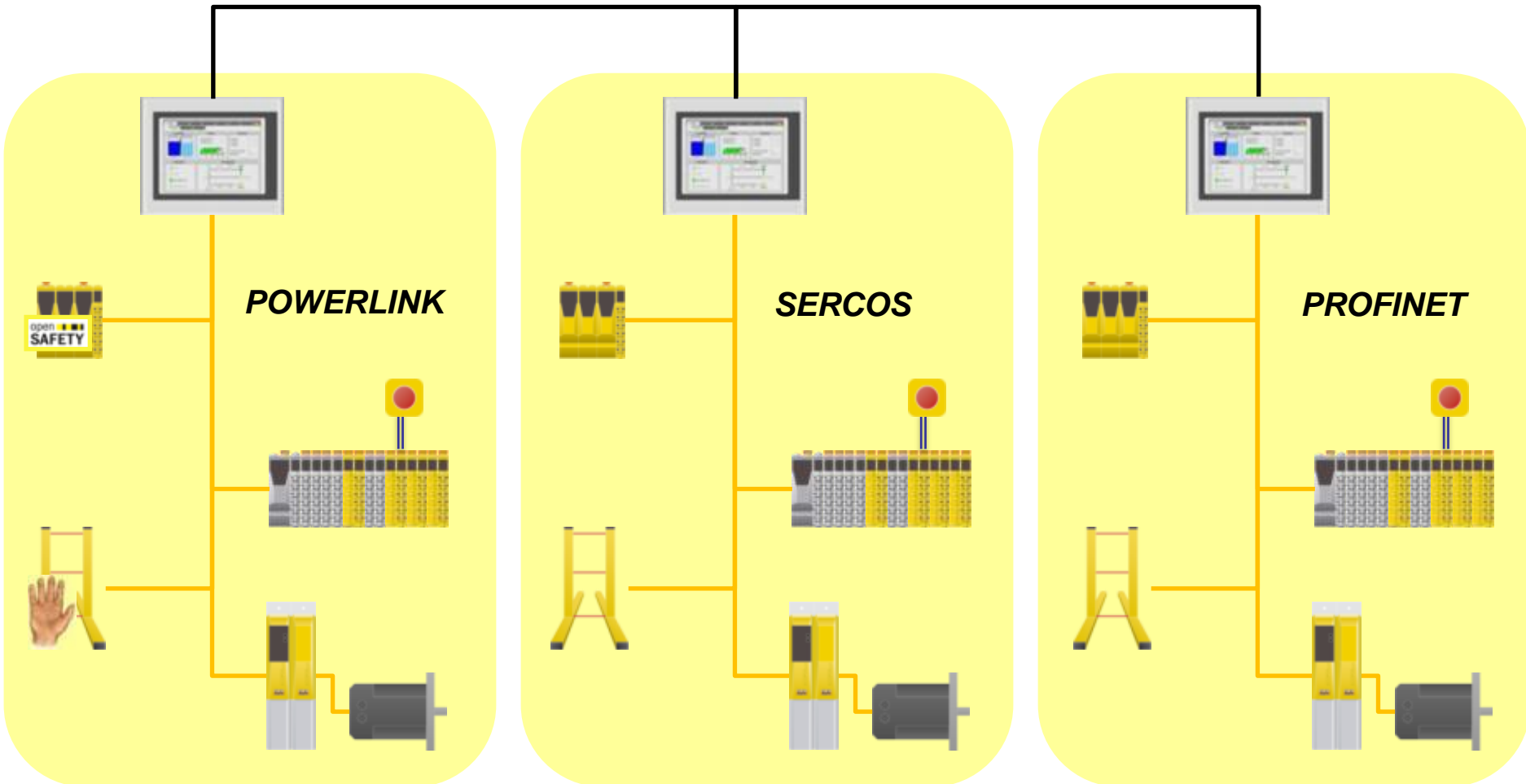
One standard for all networks

EtherNet/IP



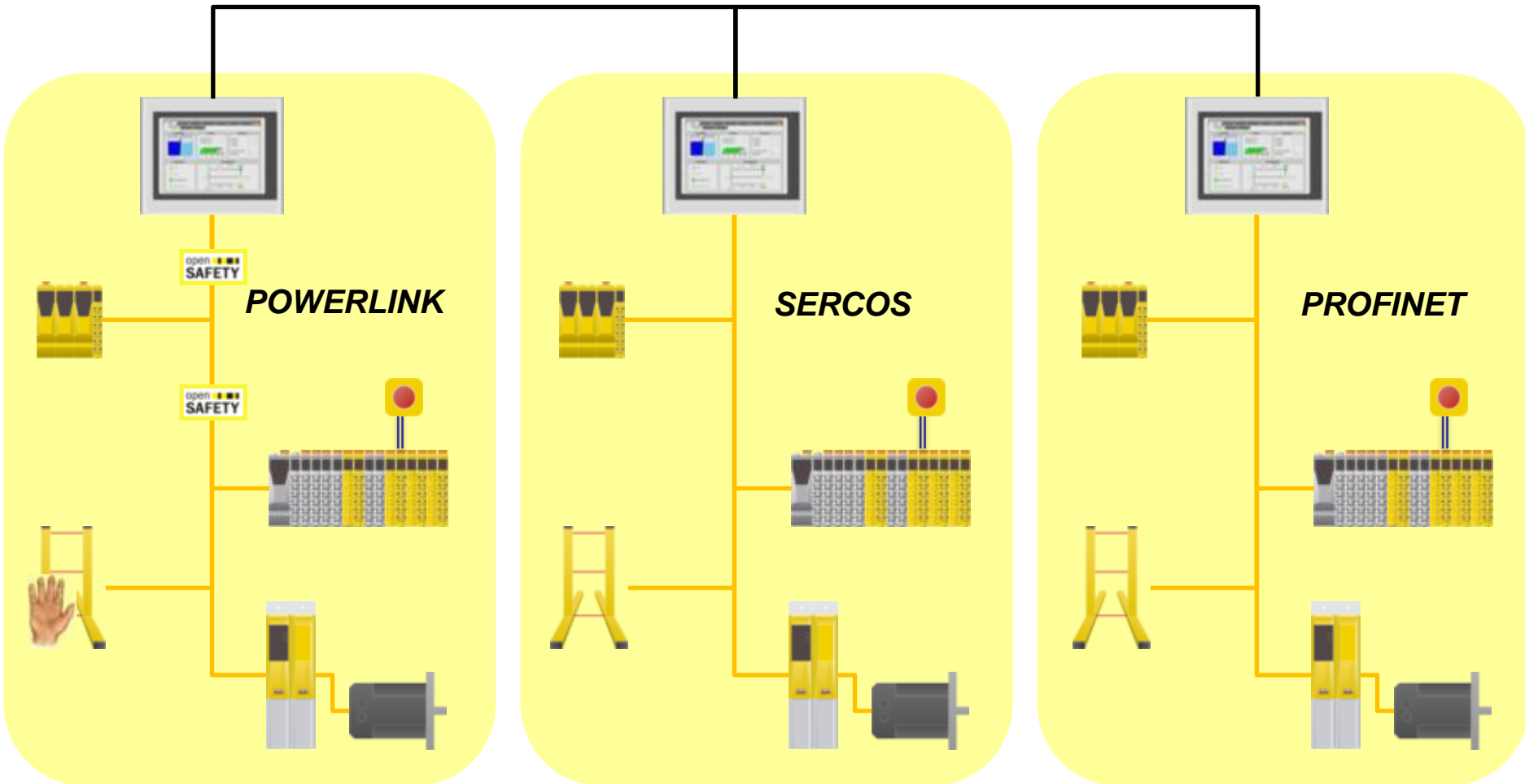
One standard for all networks

EtherNet/IP



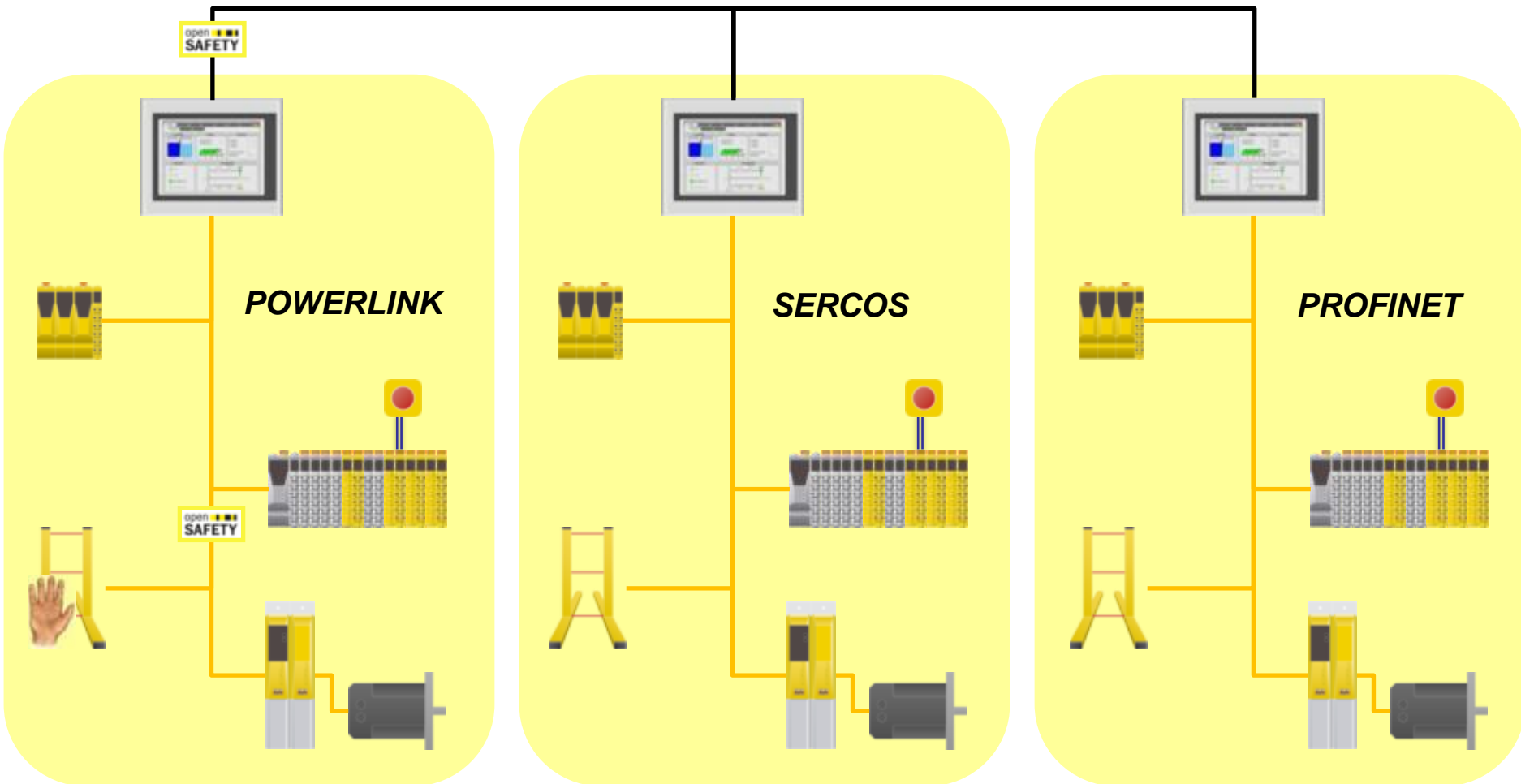
One standard for all networks

EtherNet/IP



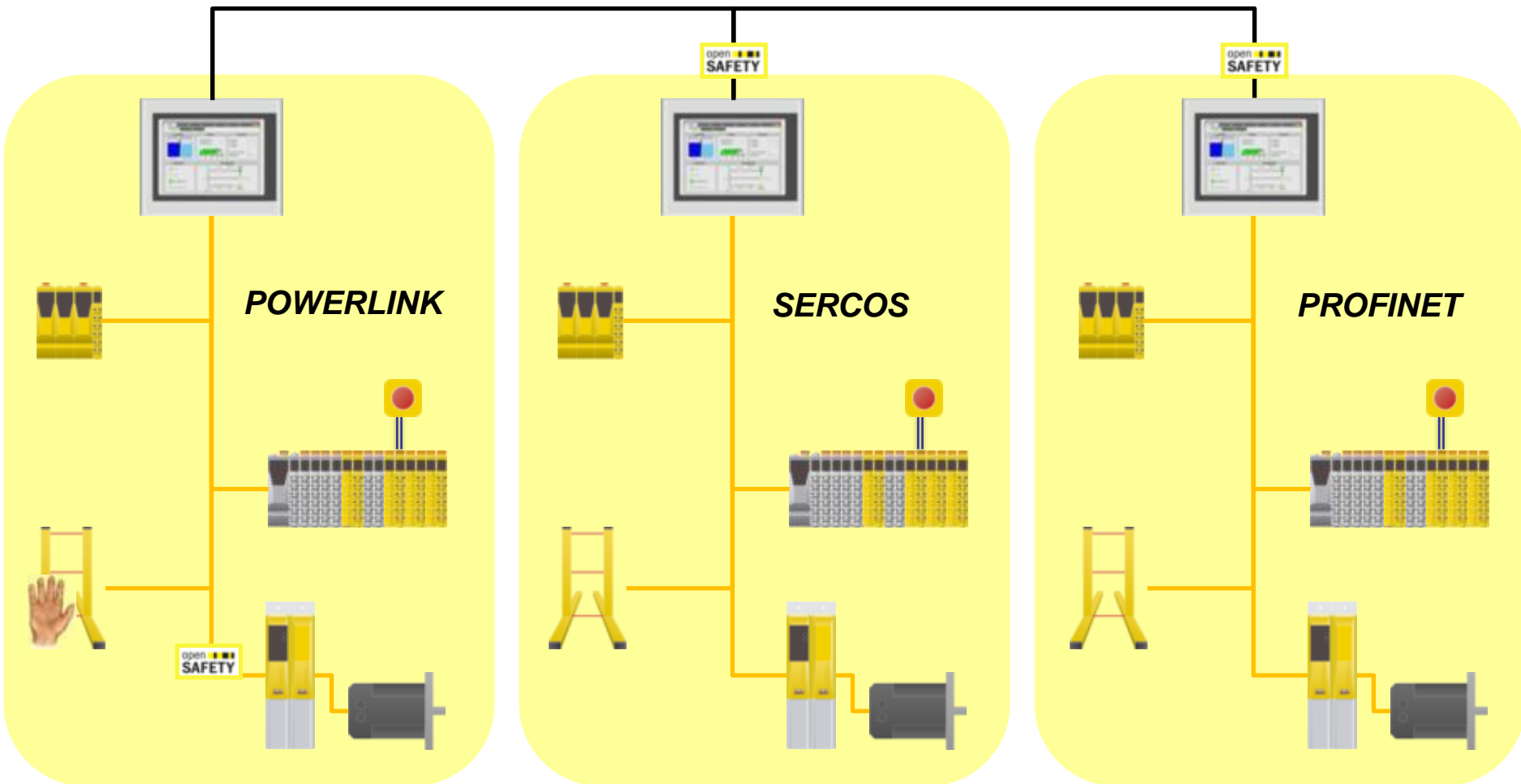
One standard for all networks

EtherNet/IP



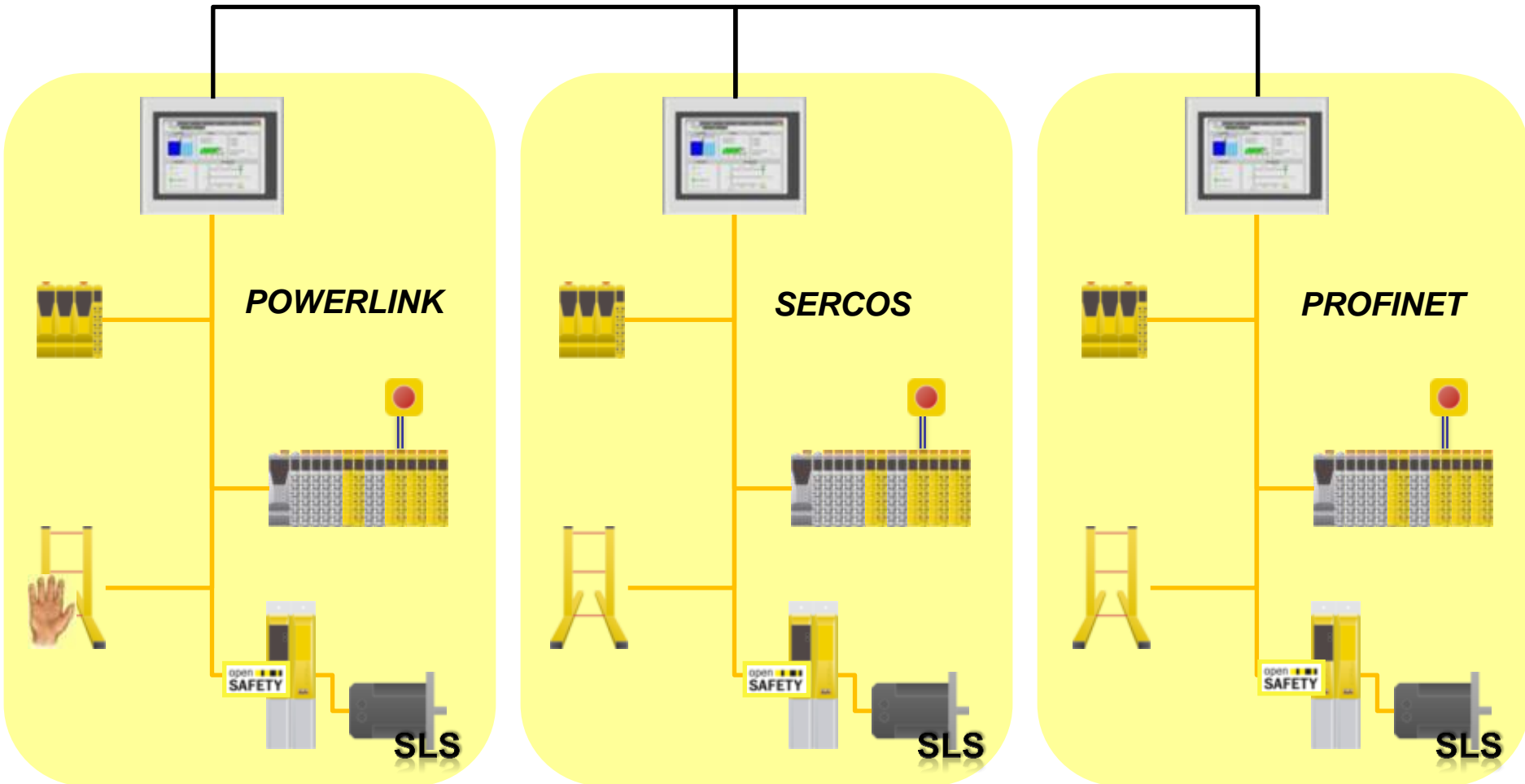
One standard for all networks

EtherNet/IP



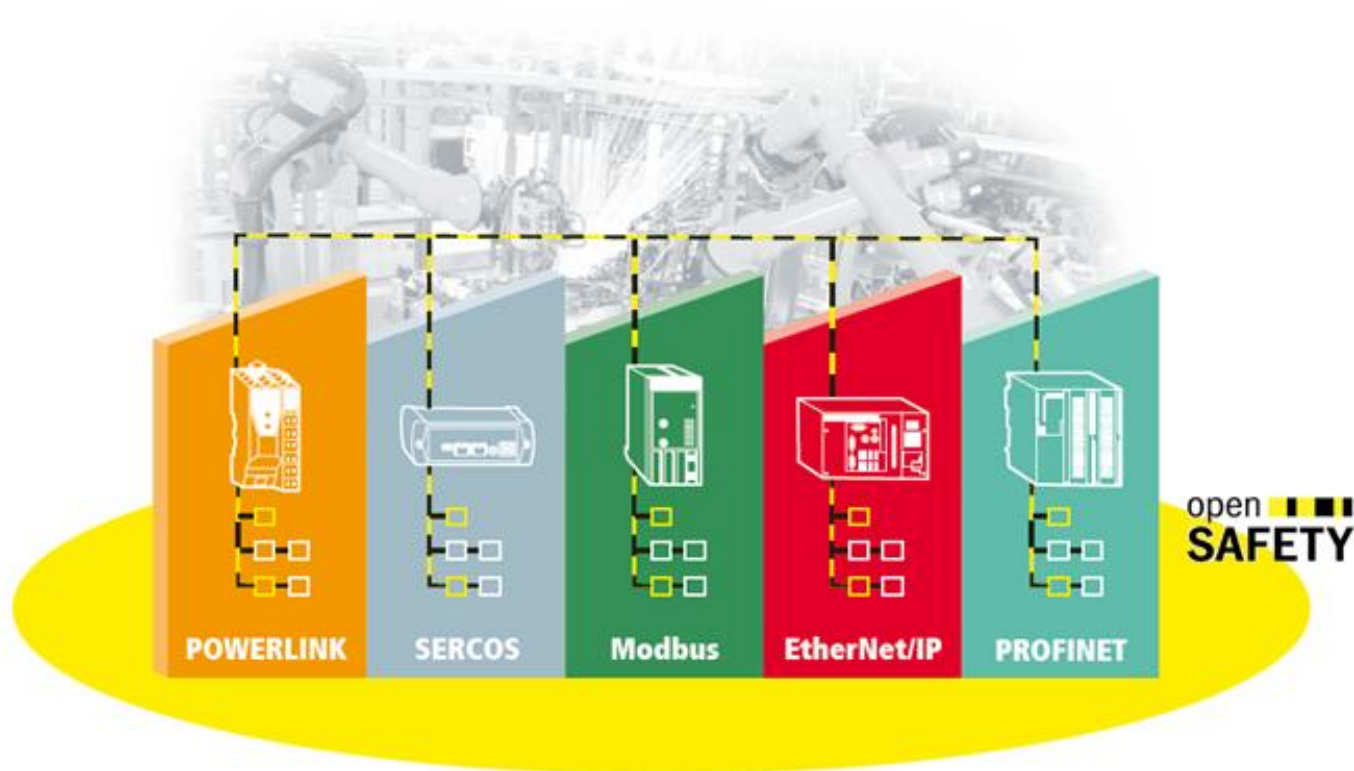
One standard for all networks

EtherNet/IP

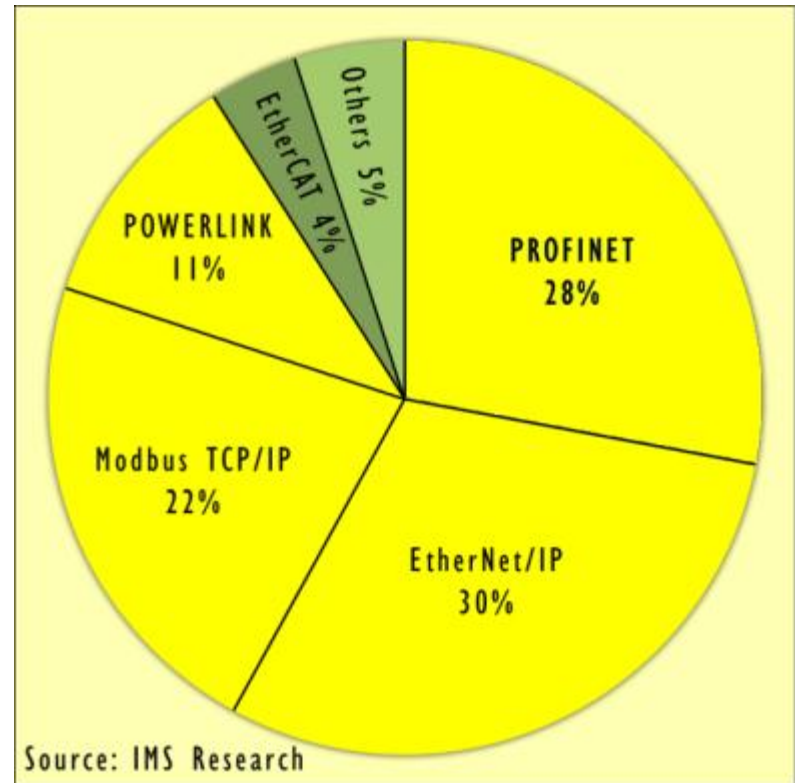


openSAFETY is open and independent

- The world's first 100% open safety protocol
- Totally independent from technical and legal aspects
- Supported by the international user organization EPSG



- openSAFETY is already operational on:
 - Ethernet TCP/UDP/IP
 - EtherNet/IP
 - Modbus TCP/IP
 - POWERLINK
 - SERCOS III
 - PROFINET
- openSAFETY covers 91% of Industrial Ethernet market !



openSAFETY is certified

open SAFETY

- TÜV certified protocol – IEC 61508 SIL3, PL e
- Certified Safe Motion Profiles – IEC 61800-5-2
- Approved as international safety standard - IEC 61784-3



open SAFETY certified product

- **Component manufacturer**
 - One time development investment
 - TÜV certified openSAFETY stack
 - Fastest possible Time-to-market
- **OEM**
 - Higher productivity
 - Reduced cost
 - Fast commissioning and easy maintenance
 - Minimal machine footprint
- **Users**
 - One safety standard for entire production plant
 - Simplified engineering and operations
 - Worldwide accepted technology
 - Total independence from technical and legal aspects

Users request openSAFETY to suppliers

- Nestlé requests their providers to support openSAFETY at Interpack fair



Bryan Griffen, Head of Electrical & Automation Engineering

Market leaders request openSAFETY

"WE FEEL SAFE ABOUT IT"

- Reliability, availability, interoperability, fast reaction times, deterministic behavior and open architecture are all key factors for power generation control. POWERLINK communication technology fulfills these requirements for distributed control systems and machine control, and with openSAFETY we are guaranteed full data integrity when exchanging data over multiple networks.

openSAFETY is the only safety standard that is fully open and independent, thus ensuring safe data exchange and complete interoperability in a multi-vendor network environment.

openSAFETY is the ideal solution for critical automation processes, today and in the future!"

Christian Reisinger
Vice President
Power Generation & Control



ALSTOM

The open standard for dependant safety technology significantly reducing safety costs, enables faster commissioning and reduces the number of safety controllers through efficient communication. openSAFETY gives you superior availability and performance. Download the openSAFETY whitepaper at www.open-safety.org

open SAFETY

"WE FEEL SAFE ABOUT IT"

- Needle is using automation and safety components from many different suppliers. Having a single safety communication standard would allow us to reliably exchange safety information across the entire factory floor, regardless of the brand of components. Such a standard would also facilitate engineering in terms of system design and commissioning and operations in regards to maintenance and troubleshooting of safety systems."



Ryan Gillies
Head of Central & Advanced Engineering
Power Generation & Control

The open standard for dependant safety technology significantly reducing safety costs, enables faster commissioning and reduces the number of safety controllers through efficient communication. openSAFETY gives you superior availability and performance. Download the openSAFETY whitepaper at www.open-safety.org

open SAFETY



"WE FEEL SAFE ABOUT IT"

- openSAFETY is a modern safety concept that allows Sidel to help our customers reduce the number of device types and the overall complexity of machine automation."

Dimitri Pasqual
President of the Division of Beverage
M&P



Sidel

The open standard for dependant safety technology significantly reducing safety costs, enables faster commissioning and reduces the number of safety controllers through efficient communication. openSAFETY gives you superior availability and performance. Download the openSAFETY whitepaper at www.open-safety.org

open SAFETY



openSAFETY for all industries



Take advantage of a strong community

open 
SAFETY

open 
SAFETY

www.open-safety.org

Linked  **in**®

<http://www.linkedin.com/groups?gid=3816766>