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- Safe from PLa – PLe
- Concept Comparisons
- Personal Consulting

SAFETY TECHNOLOGY

From Murrelektronik

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OPTIMUM PROTECTION FOR MAN AND MACHINE

Safety Technology from Murrelektronik

Optimum protection for man and machine. Safety technology is a major topic in the automation industry. Murrelektronik's decentralized installation concepts make it possible to reach the highest safety categories within a complete system.

Murrelektronik offers a variety of solutions for different applications and requirements – all with excellent price/performance ratios.

If your goal is to switch off outputs safely (by shutting down the affected components), you can design a safe installation by combining both passive safety fieldbus modules with reliable safety relays. Using fully tested, well-known standard fieldbus modules makes it easy to access this technology.

With MVK Metal Safety and Cube20S, Murrelektronik offers high-end safety solutions. These fieldbus modules generate safe inputs and outputs in combination with a safe control (F-PLC or CNC). By using either PROFINET/PROFIsafe or PROFIBUS/PROFIsafe fieldbus protocols you ensure the reliable transfer of safety-related data and make it possible to achieve the highest safety standards. Their comprehensive diagnostic options simplify operation.

APPLICATIONS

- Two-hand control devices
- Emergency stop circuits
- Guard doors
- Safety mats
- Light barriers

INDUSTRIES

- Machine tools and machining centers
- Forming and sheet metal working
- Warehousing, logistics and automotive
- Foundry plants and forges
- Cutting and welding units


MURR
MIRO SAFE+
T 2 24
MURR
MIRO SAFE+
T 1 24

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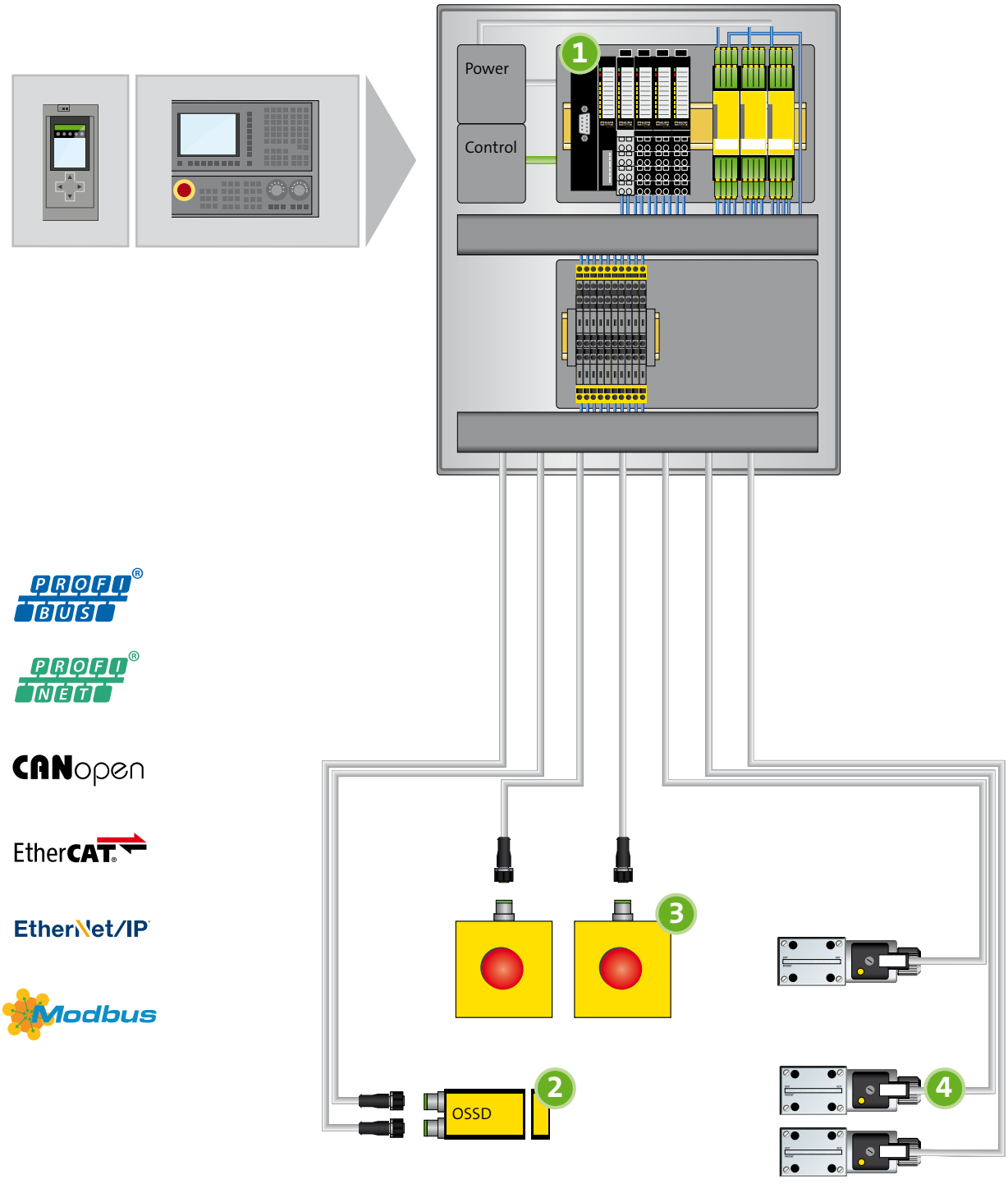
SAFETY RELAYS

Safety technology is a major topic in machine building and plant engineering. Most basic machine safety applications have been using safety relays for many years. They provide a high degree of ability to work correctly or to fail in a safe manner. Low complexity, no programming or additional software to purchase or maintain make them a popular safety device in many applications.

Murrelektronik's MIRO SAFE+ safety relays are the solution for achieving safety standards up to performance level e (PLe) according to EN ISO 13849-1. They allow you to design many different safety applications including emergency stops, guard doors, two hand monitoring, light curtains, pressure sensitive mats and safety magnet switch monitoring. Moreover, they work with wide input voltage ranges and provide clear identification thanks to status LEDs and label plates.
High reliability, user-friendly installation and maintenance as well as engineering flexibility are what describe MIRO SAFE+.



PROFIBUS®

PROFINET®

CANopen

EtherCAT®

EtherNet/IP™

Modbus

ADDITIONAL COMPONENTS

1 CUBE20S
- Easy to install
- High performance and flexibility
- Response time: up to 20 µs
- Modular: 2-, 4- and 8-channel modules

2 SAFETY DEVICES
- Compatible with different types of safety devices
- Manufacturer independent
- Guard door switches, light curtains etc.

3 EMERGENCY STOP BUTTON
- Easy M12 (4, 5 or 8 pole) plug & play connection
- Available with reset button and/or illumination
- Easy mounting (Ex: aluminum profiles)

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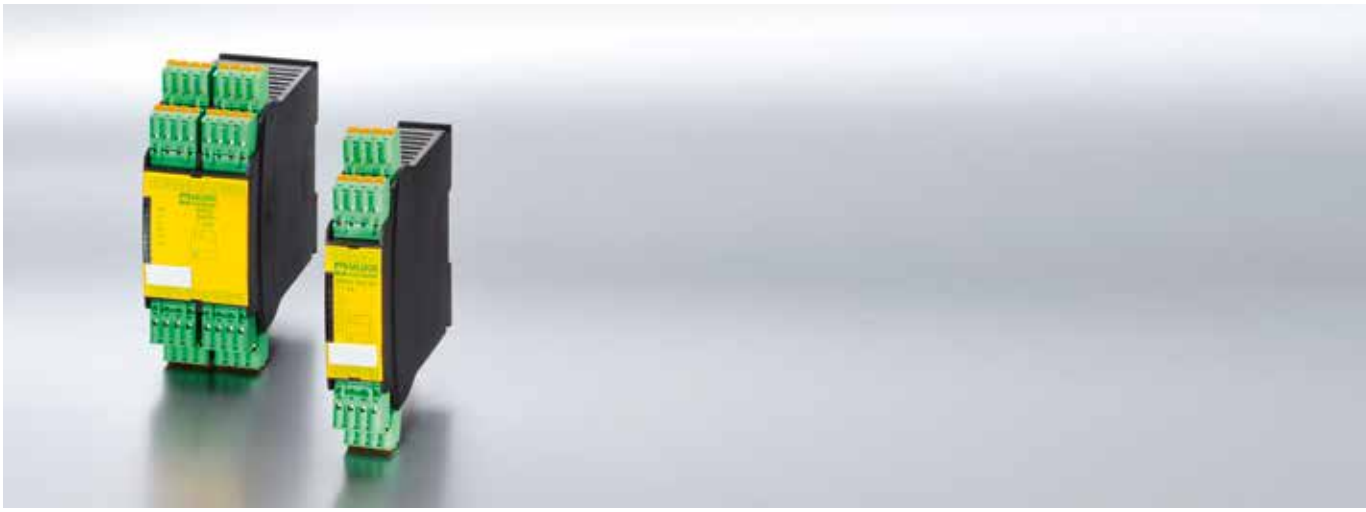
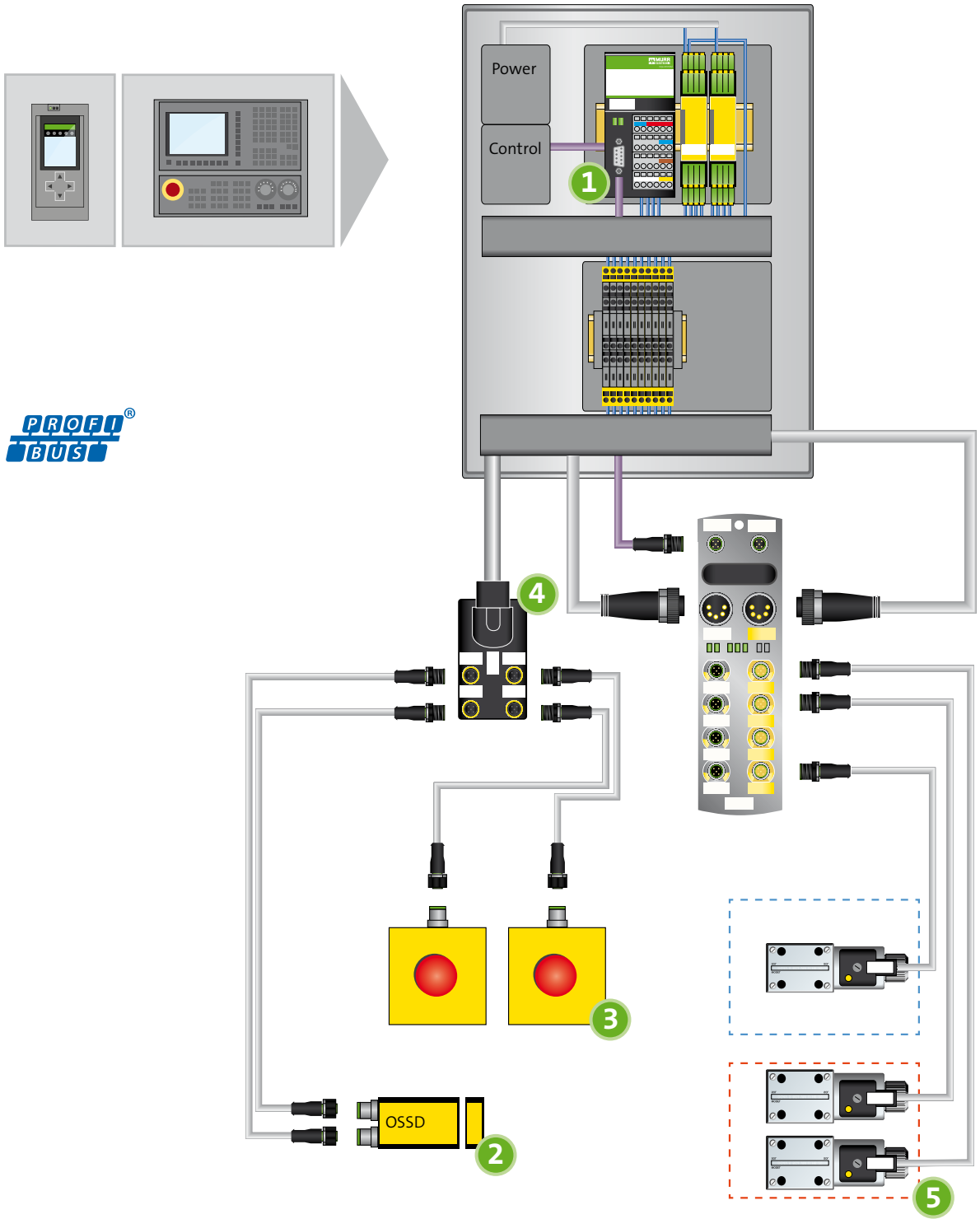
SINGLE WIRING
WITH SAFETY RELAYS



DESCRIPTION

- The universal solution for emergency stop, guard door, light curtain and magnetic switch applications
- LED status indicator on the front of the relay
- Pluggable spring clamp terminals
- Clear identification with label plates
- Start-button monitoring available
- Wide voltage input at 24 V DC (-15%/+20%)
- Suitable up to max. SIL 3/PLe

VALVE CONNECTORS
- Field wireable or molded Solutions
- Optional cabling to simplify installation
- Quick connection technology



ADDITIONAL COMPONENTS

1 IMPACT20
- Predefined inputs and outputs
- Single Channel Diagnostic via LED
- Group Diagnostic via the bus
- Channel-Related shut down

2 SAFETY DEVICES
- Compatible with different types of safety devices
- Manufacturer independent
- Guard door switches, light curtains etc.

3 EMERGENCY STOP BUTTON
- Easy M12 (4, 5 or 8 pole) plug & play connection
- Available with reset button and/or illumination
- Easy mounting (Ex: aluminum profiles)

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SAFETY BLOCK CIRCUIT

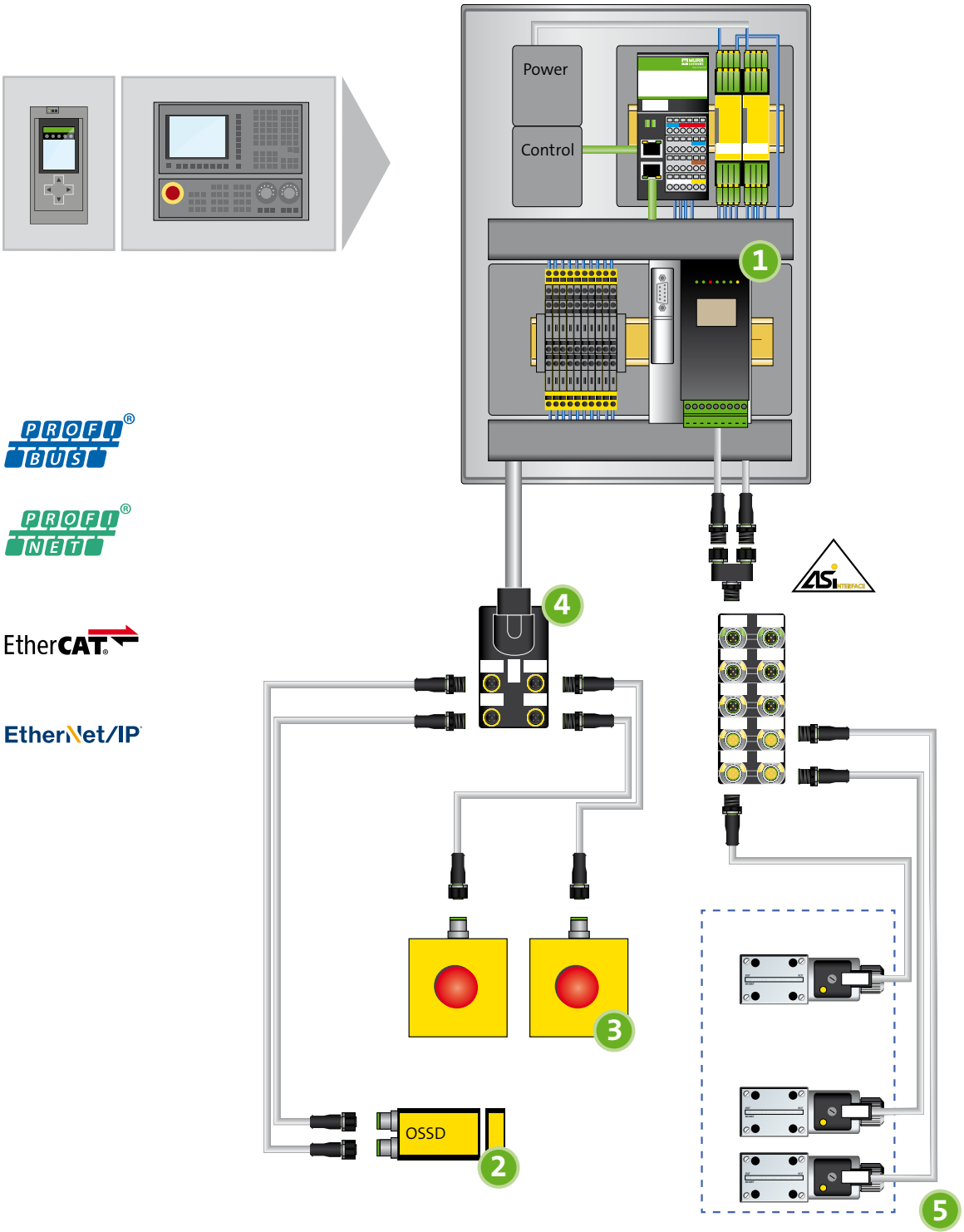
with MVK Metal compact Fieldbus modules and safety relays

DESCRIPTION

- Profibus applications
- Two safety groups per module
- Standard signals and safety outputs in one module
- Safety outputs with 2 A (short-circuit and overload protected)
- 8 standard digital signals (multiconfigurable)
- Compact module with rugged metal housing (IP67)
- Safety outputs up to PLd (in combination with MVK Safety, CUBE20S or safety relay)

4 SAFETY DISTRIBUTION BOX
- Service adapter for setup, troubleshooting and control
- TPU molding: sealed, resistant to coolants, oil and vibration (50g)
- 4 or 8 port models

5 VALVE CONNECTORS
- Field wireable or molded solutions
- Optional cabling to simplify installation
- Quick connection technology



PROFIBUS®

PROFINET®

EtherCAT®

EtherNet/IP™

ADDITIONAL COMPONENTS

1 GATEWAY
- 1 AS-Interface Master = up to 62 slaves
- AS-Interface 3.0 specification
- Diagnostics by display, LED, bus interface
- AS-Interface Power 24 gateways also available

2 SAFETY DEVICES
- Compatible with different types of safety devices
- Manufacturer independent
- Guard door switches, light curtains etc.

3 EMERGENCY STOP BUTTON
- Easy M12 (4, 5 or 8 pole) plug & play connection
- Available with reset button and/or illumination
- Easy mounting (Ex: aluminum profiles)

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SAFETY BLOCK CIRCUIT

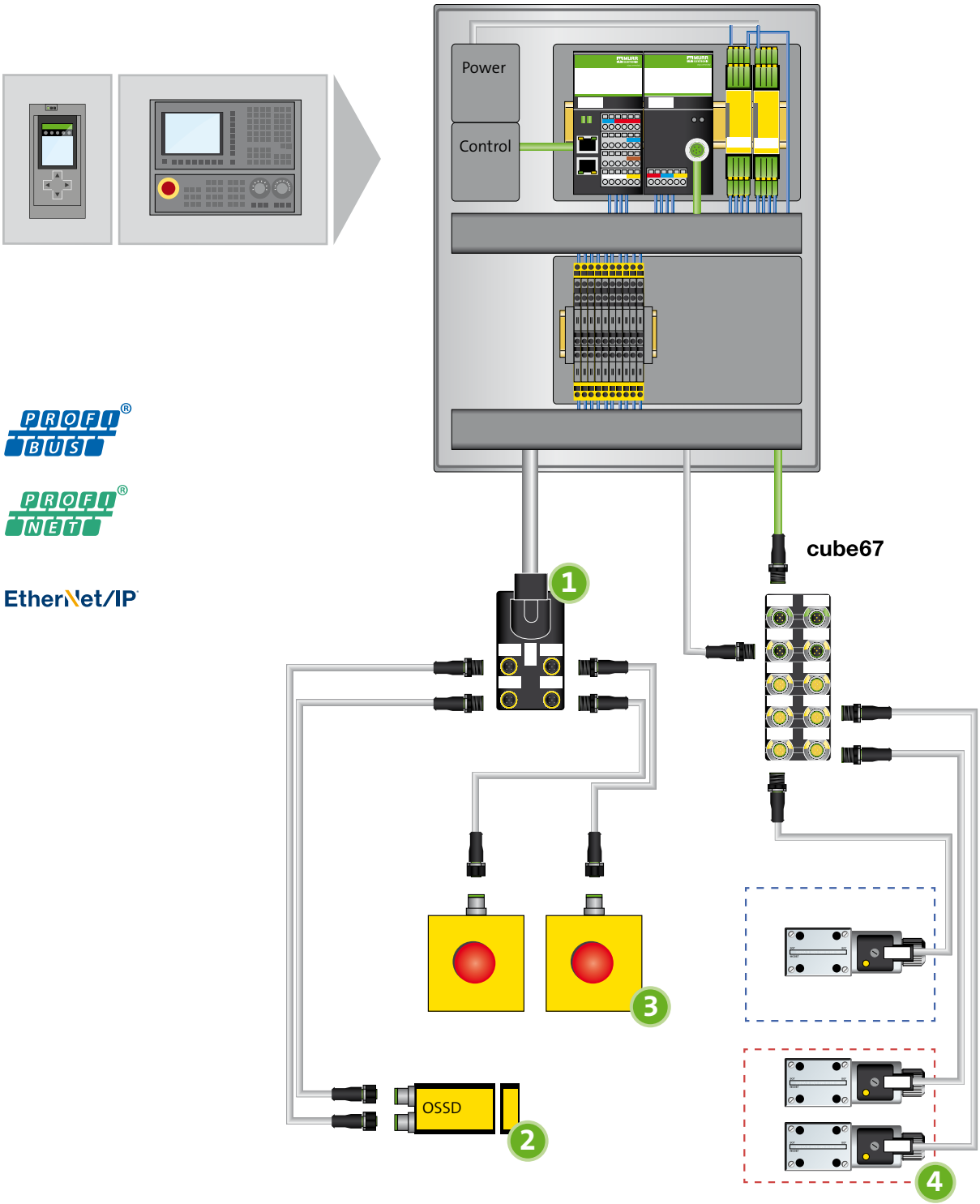
with MASI fieldbus modules and Safety Relais

DESCRIPTION

- Modular system, MASI safety modules available with combination with popular fieldbus applications
- Modules for flat (IP67) and round (IP68) cable, plus cabinet applications (IP20)
- Versions with combined safe outputs and non-safe signals
- Safety outputs with 1.6 A (short-circuit and overload protected)
- Safety outputs up to PLd (in combination with MVK Safety, CUBE20S or safety relay)

4 SAFETY DISTRIBUTION BOX
- Service adapter for setup, troubleshooting and control
- TPU molding: sealed, resistant to coolants, oil and vibration (50g)
- 4 or 8 port models

5 VALVE CONNECTORS
- Field wireable or molded solutions
- Optional cabling to simplify installation
- Quick connection technology



PROFIBUS®

PROFINET®

EtherNet/IP

ADDITIONAL COMPONENTS

1 SAFETY DISTRIBUTION BOX
- Service adapter for setup, troubleshooting and control
- TPU molding: sealed, resistant to coolants, oil and vibration (50 g)
- 4 or 8 port models

2 SAFETY DEVICES
- Compatible with different types of safety devices
- Manufacturer independent
- Guard door switches, light curtains etc.

3 EMERGENCY STOP BUTTON
- Easy M12 (4, 5 or 8 pole) plug & play connection
- Available with reset button and/or illumination
- Easy mounting (Ex: aluminum profiles)

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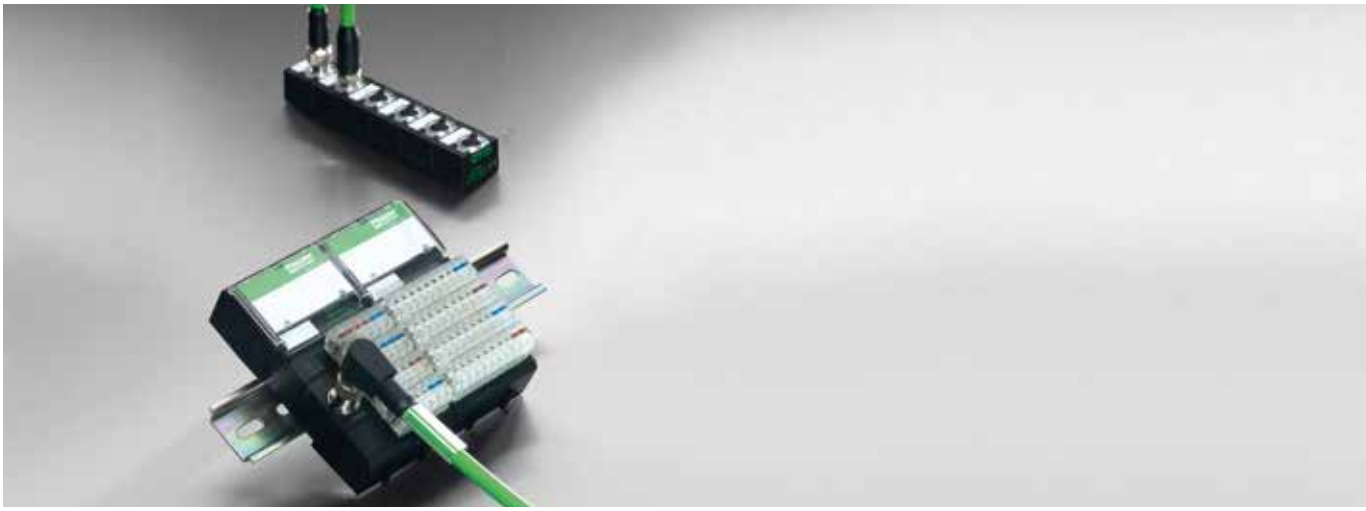
SAFETY BLOCK CIRCUIT

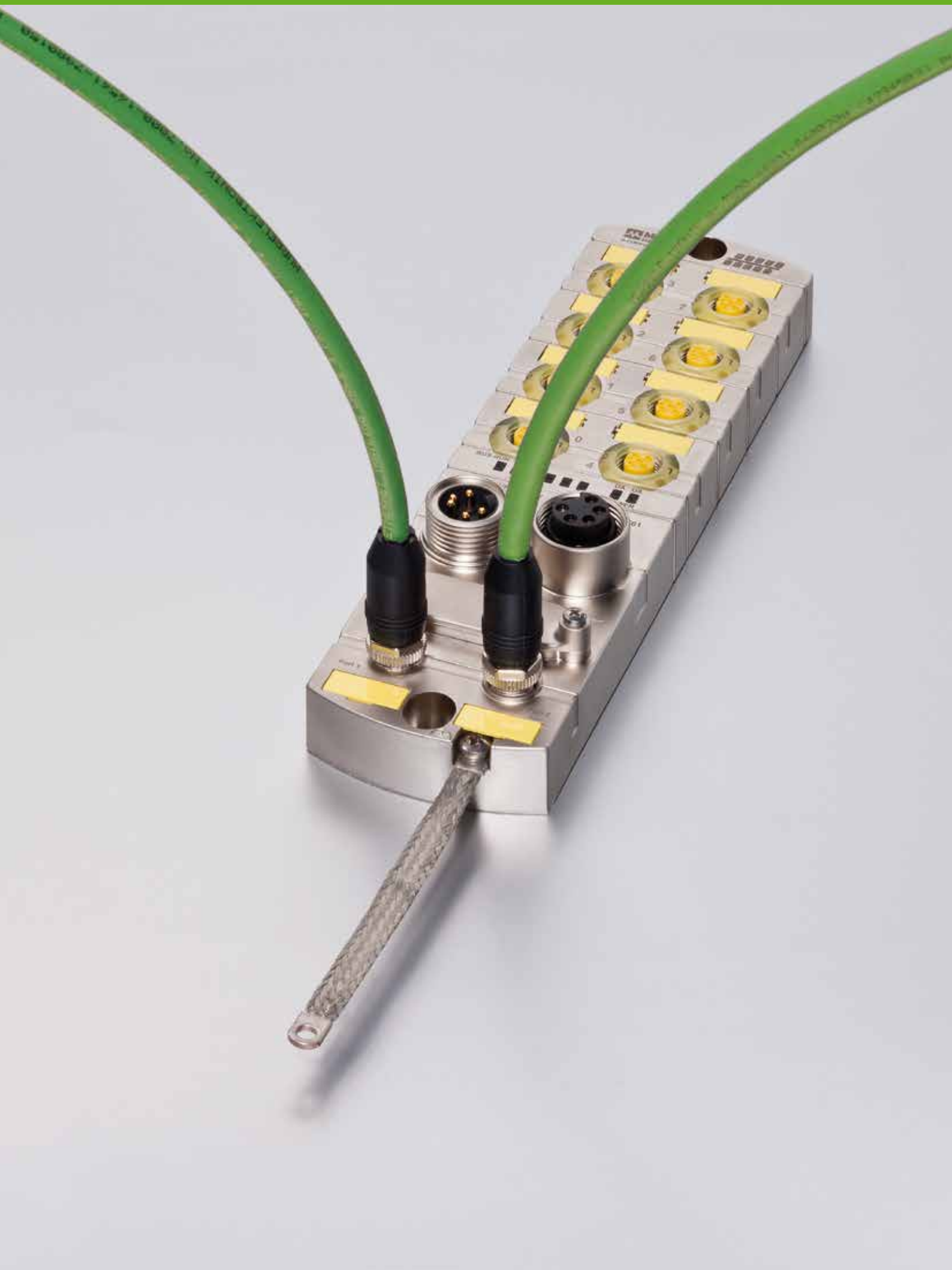
with Cube fieldbus modules and safety relays



DESCRIPTION

- Modular system, safety available for all Cube67/20 bus nodes
- Two safety groups per module
- 1.6 A Safety outputs (short-circuit and overload protected)
- Safety power daisy-chaining
- Safety outputs up to PLd (in combination with MVK Safety, Cube20S or safety relay)

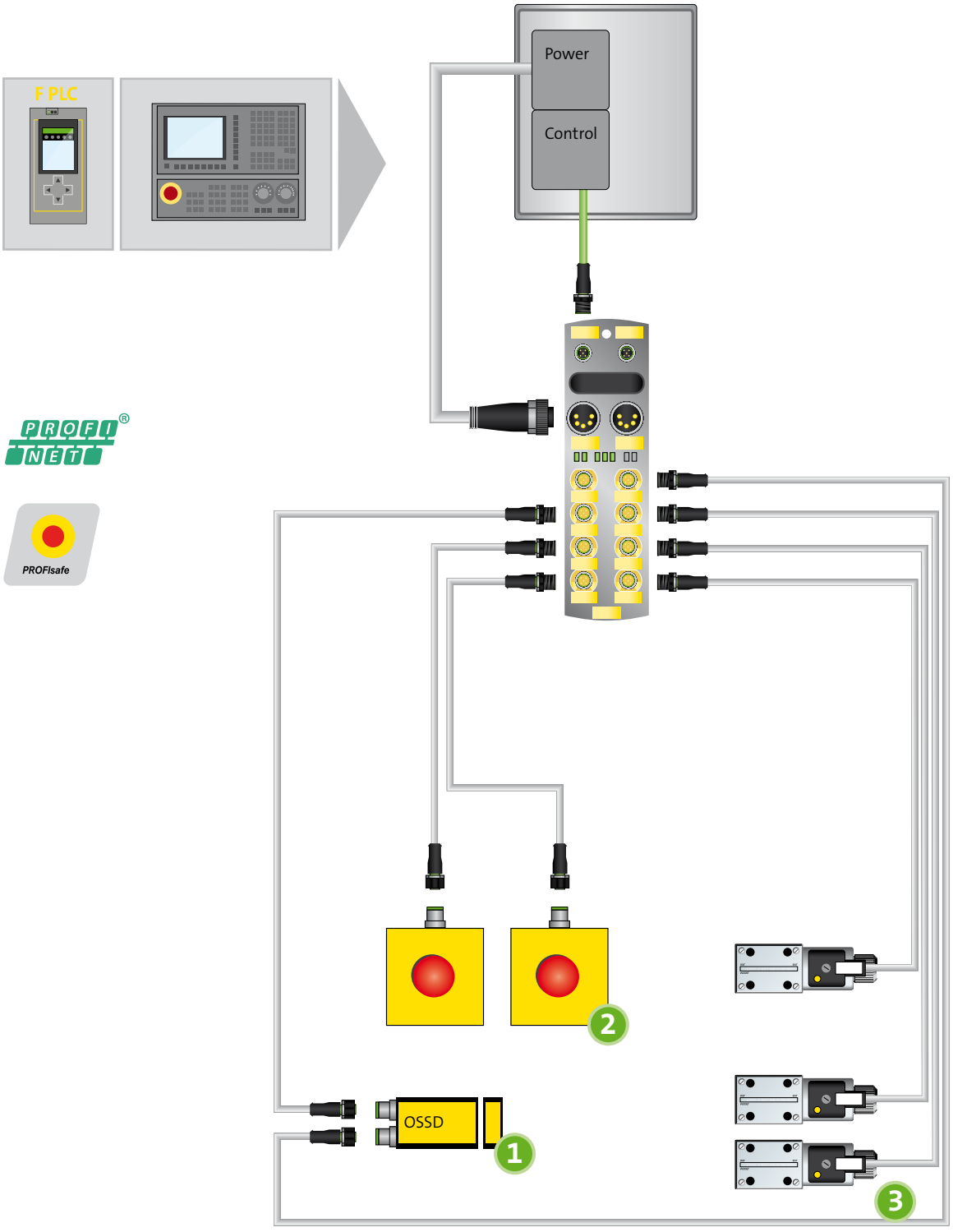
VALVE CONNECTORS
- Field wireable or molded solutions
- Optional cabling to simplify installation
- Quick connection technology



FIELDBUS MODULES

The fully potted I/O modules are suitable for applications in harsh industrial environments, thanks to IP67 protection and a high resistance to media and vibrations. Moreover, they feature comprehensive diagnostic options. Errors such as overload, sensor short circuit or wire breaks are monitored for each individual channel, signaled by an LED at the affected port and reported to the control.

MVK Metal Safety uses PROFIsafe – a safety-related expansion of ProfiNet to transfer safety-related data. This standard protocol for industrial applications allows you to use preexisting communication technologies which saves on both wiring and installation time. Another benefit is that standard ProfiNet modules can be integrated into the individual lines.



ADDITIONAL COMPONENTS

1 SAFETY DEVICES
- Compatible with different types of safety devices
- Manufacturer independent
- Guard door switches, light curtains etc.

2 EMERGENCY STOP BUTTON
- Easy M12 (4, 5 or 8 pole) plug & play connection
- Available with reset button and/or illumination
- Easy mounting (Ex: aluminum profiles)

3 VALVE CONNECTORS
- Field wireable or molded solutions
- Optional cabling to simplify installation
- Quick connection technology

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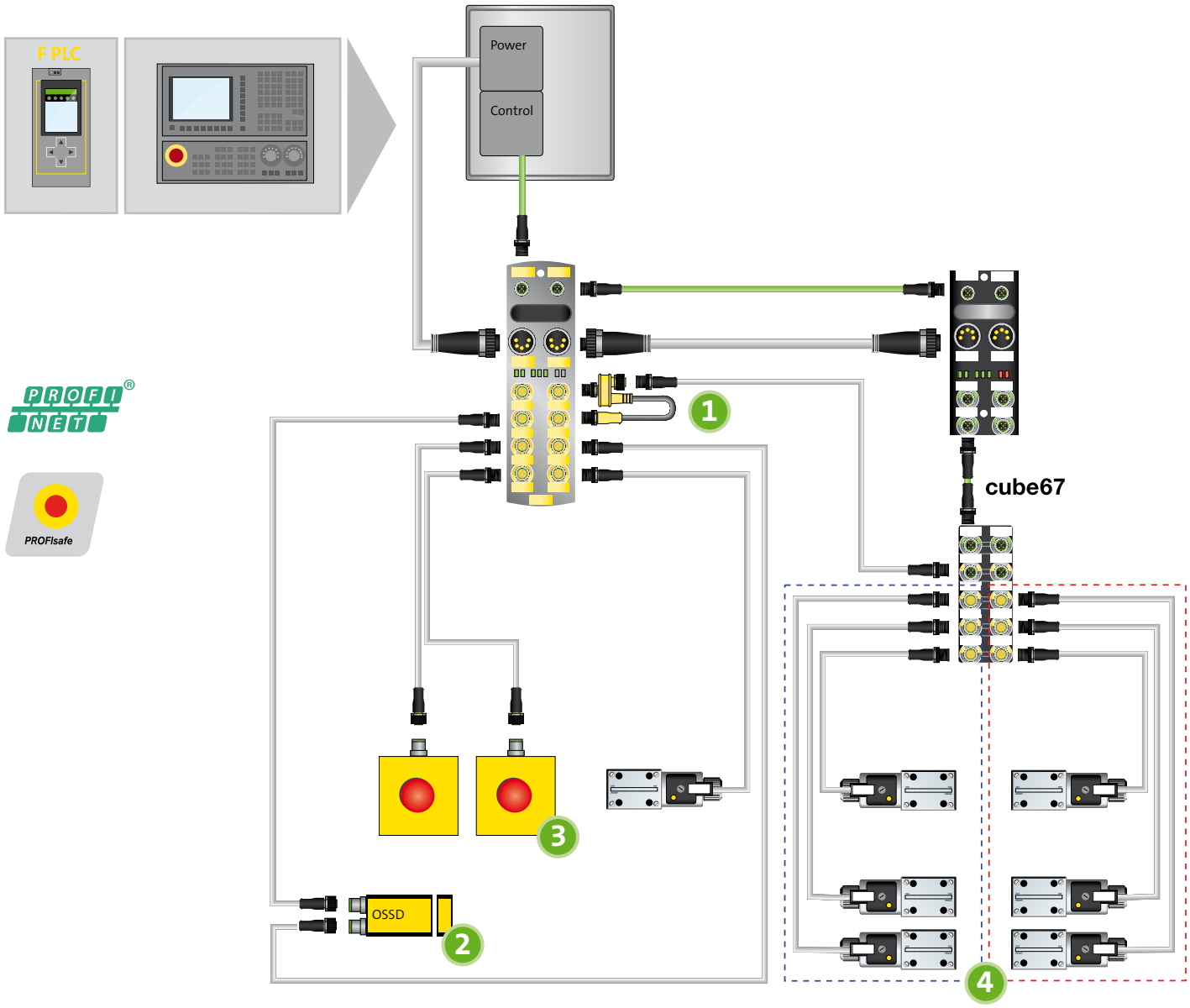
SAFE INPUT AND OUTPUT CIRCUITS

by a safe control with MVK metal safety compact fieldbus modules

DESCRIPTION

- Profinet/Profisafe applications, suitable up to max. SIL3/PLe
- Compact module with rugged metal housing (IP67)
- Safe inputs and outputs combined in a single module
- Comprehensive diagnostics
- Activation of test pulses for each channel individually
- Safety with opposite polarity between channels
- Single-/Two-Channel inputs
- Cable break recognition and output overload monitoring
- Adjustable discrepancy time
- PM switching



PROFINET®

PROFIsafe

ADDITIONAL COMPONENTS

1 T-COUPLERS
- Wide range of T- and Y-couplers
- Standard signals and special application solutions
- 5-pole and 8-pole Adaptors

2 SAFETY DEVICES
- Compatible with different types of safety devices
- Manufacturer independent
- Guard door switches, light curtains etc.

3 EMERGENCY STOP BUTTON
- Easy M12 (4, 5 or 8 pole) plug & play connection
- Available with reset button and/or illumination
- Easy mounting (Ex: aluminum profiles)

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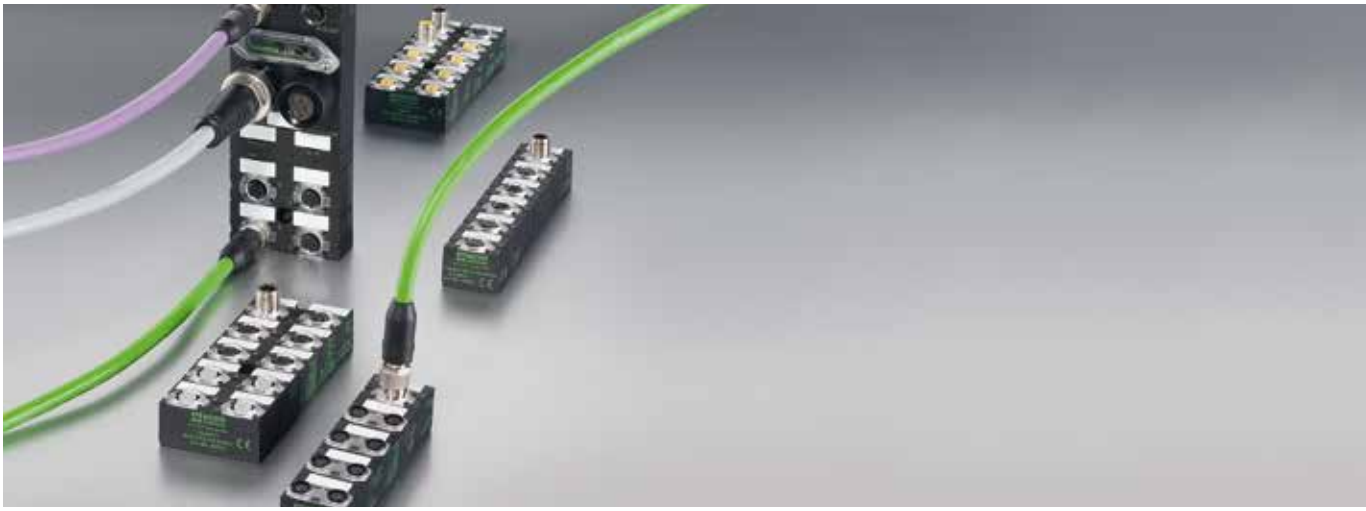
SAFE INPUT AND OUTPUT CIRCUITS

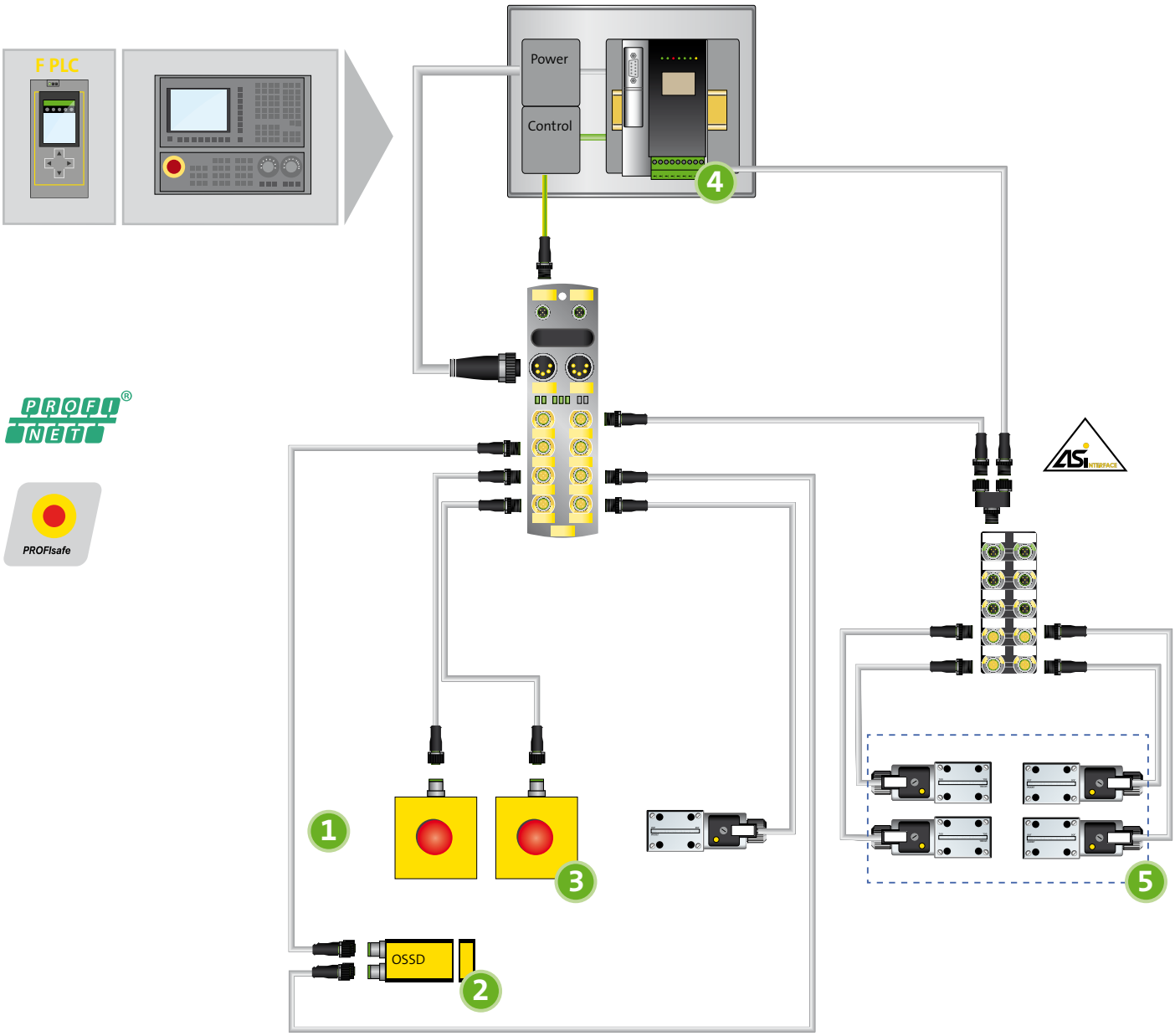
by a safe control with compact fieldbus modules and Cube67 block circuit



DESCRIPTION

- Modular system, safety available for all Cube67/20 bus nodes
- Two safety groups per module
- 1.6 A safety outputs (short-circuit and overload protected)
- Safety power daisy-chaining
- Safety outputs up to PLd (in combination with MVK Safety, Cube20S or safety relay)

VALVE CONNECTORS
- Field wireable or molded solutions
- Optional cabling to simplify installation
- Quick connection technology



ADDITIONAL COMPONENTS

1 CORDSETS
- Over 30,000 types. Each fully tested.
- IP67 protection, shock and vibration resistant
- AIDA specification versions with yellow overmold available

2 SAFETY DEVICES
- Compatible with different types of safety devices
- Manufacturer independent
- Guard door switches, light curtains etc.

3 EMERGENCY STOP BUTTON
- Easy M12 (4, 5 or 8 pole) plug & play connection
- Available with reset button and/or illumination
- Easy mounting (Ex: aluminum profiles)

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SAFE INPUT AND OUTPUT CIRCUITS

by a safe control with compact fieldbus modules and MASI block circuit

DESCRIPTION

- Modular system, MASI safety modules available to work in combination with popular fieldbus applications
- Modules for flat (IP67) and round (IP68) cable, plus cabinet applications (IP20)
- Versions with combined safe outputs and non-safe signals
- 1.6 A safety outputs (short-circuit and overload protected)
- Safety outputs up to PLd (in in combination with MVK Safety, CUBE20S or safety relay)

4 GATEWAY
- 1 AS Interface Master = up to 62 slaves
- AS Interface 3.0 specification
- Diagnostics by display, LED, bus interface
- AS Interface Power 24 Gateways available

5 VALVE CONNECTORS
- Field wireable or molded solutions
- Optional cabling to simplify installation
- Quick connection technology


PWR
BF
MT
LNK1
ACT1
LNK2
ACT2
RUN
MF
PWR
PF
RUN
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PWR ID
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PWR ID
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MF

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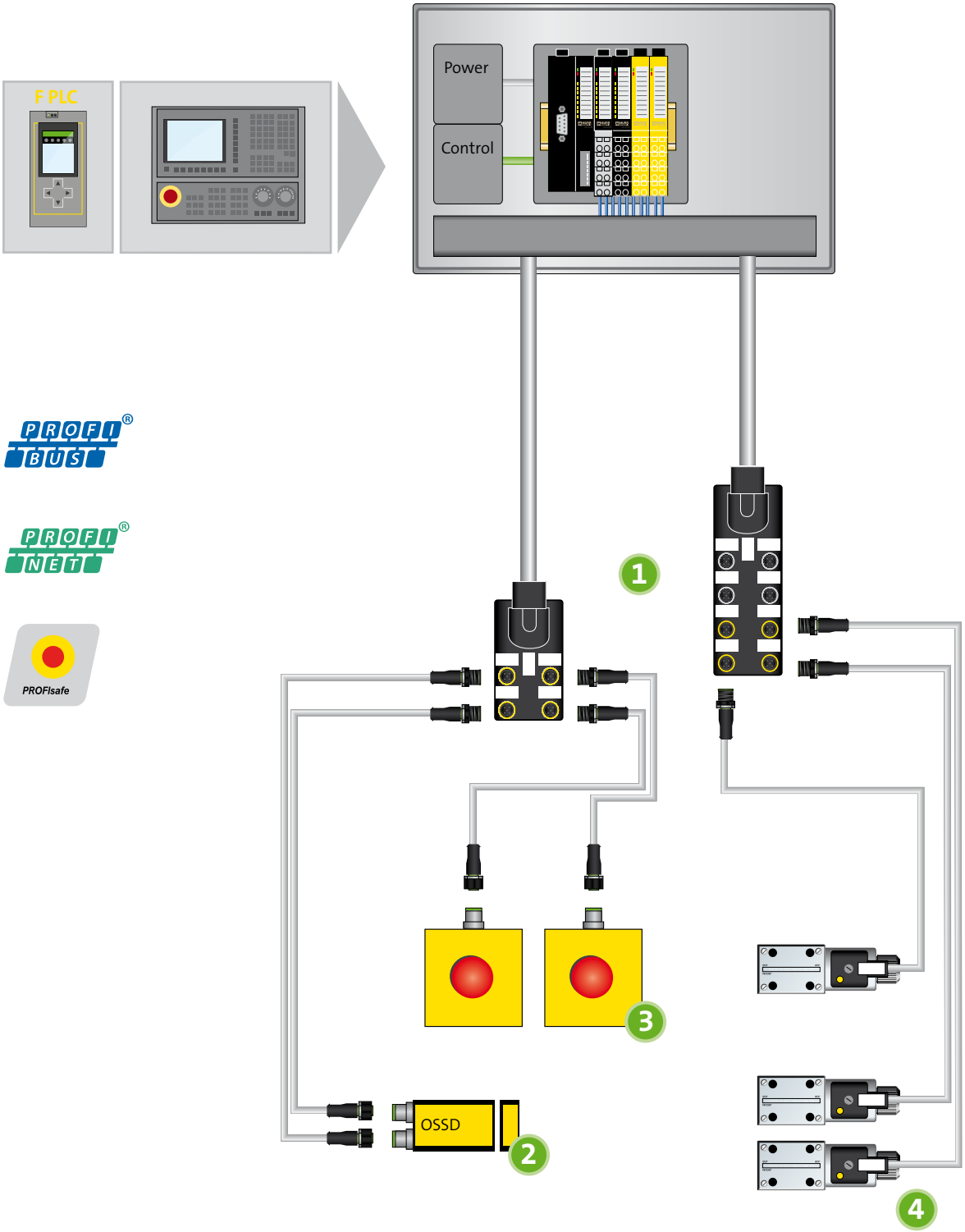
CUBE20S

Murrelektronik's Cube20S I/O system is an IP20 rated member of the field-tested Cube family. The 12.9-millimeter wide modules can be easily and quickly connected – the integrated backplane bus connects up to 64 modules per bus node to power and data.

Safety modules (inputs and outputs) can be used in Profinet/ PROFIsafe and Profibus/PROFIsafe applications. Cube20S offers standard and safety I/Os in one system making it highly flexible and efficient.



PROFIBUS®

PROFINET®

PROFIsafe

ADDITIONAL COMPONENTS

1 SAFETY DISTRIBUTION BOX
- Service adapter for setup, troubleshooting and control
- TPU molding: sealed, resistant to coolants, oil and vibration (50g)
- 4 or 8 port models

2 SAFETY DEVICES
- Compatible with different types of safety devices
- Manufacturer independent
- Guard door switches, light curtains etc.

3 EMERGENCY STOP BUTTON
- Easy M12 (4, 5 or 8 pole) plug & play connection
- Available with reset button and/or illumination
- Easy mounting (Ex: aluminum profiles)

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SAFE INPUT AND OUTPUT CIRCUITS

by a safe control with Cube20S IP20 fieldbus modules

DESCRIPTION

- Profinet/Profisafe and Profibus/Profisafe Applications
- Standard and Safety I/Os in one modular system
- Status LEDs with clear channel assignment
- 4 single-channel inputs or 2 two-channel inputs (configurable)
- 4 outputs (two-channel structure internally, PP switching)
- No special node required
- Suitable up to max. SIL3/PLe

VALVE CONNECTORS
- Field wireable or molded solutions
- Optional cabling to simplify installation
- Quick connection technology

MVK SAFETY

Description	Art.-No.
MVK ProfiNet/PROFIsafe Compact Module, metal, DI16/8, IRT, push-pull connection	**55562**
MVK PROFINET/PROFIsafe Compact Module, metal, DI8/4 DO4, IRT, push-pull connection	**55563**
MVK ProfiNet/PROFIsafe Compact Module, metal, DI16/8, IRT, 7/8“ power connection	**55556**
MVK ProfiNet/PROFIsafe Compact Module, metal, DI8/4 DO4, IRT, 7/8“ power connection	**55557**
Accessory: Cable fixation 8xM12 black, to lock the plug position of actor/sensor cables	**55554**

CUBE20S

Description	Art.-No.
Cube20S Safety Input Module, DI4/2	57290
Cube20S Safety Output Module, DO4/2	57390
Cube20S Profinet Bus node	57106
Cube20S Profibus Bus node	57101

K3 MODULES

Description	Art.-No.
MVK Profibus DP Compact Module K3, metal, 8 digital passive safety outputs/8 multif. channels (2 groups)	55291
Cube67 I/O Extension Module K3, 12 digital passive safety outputs (2 Groups)	56605
Cube67 I/O Comapct Module K3, Valve-interface, 16 digital passive safety outputs (4 groups)	56650
Cube67 I/O Comapct Module K3, Valve-interface, 8 digital passive safety outputs (4 groups)	5665003
MASI67 I/O Module AB K3, 4 digital inputs, 4 digital passive safety outputs (2 groups)	56414
MASI67 I/O Module AB K3, 8 digital inputs, 8 digital passive safety outputs (2 groups)	56415
MASI68 I/O Extension Module AB K3, 8 digital passive safety outputs	56447
MASI68 I/O Compact Module AB K3, 4 digital inputs, 4 digital passive safety outputs	56423
MASI68 I/O Extension Module AB K3, 4 digital inputs, 4 digital passive safety outputs	56428
MASI20 I/O Module AB K3, 4 digital inputs, 4 digital passive safety outputs	56440

MIRO SAFE+

Description	Art.-No.
MIRO SAFE+ Switch ECOA 24 safety relay with 2 N/O contacts and 1 PLC output	3000-33113-3020005
MIRO SAFE+ Switch BCS L 24 safety relay with 3 N/O contacts and 1 N/C contact	3000-33113-3020020
MIRO SAFE+ Switch BA L 24 safety relay with 3 N/O contacts and 1 N/C contact	3000-33113-3020025
MIRO SAFE+ Switch H L 24 safety relay with 3 N/O contacts and 1 N/C contact	3000-33113-3020012
MIRO SAFE+ Switch H 48-230 safety relay with 3 N/O contacts and 1 N/C contact	3000-33113-1020012
MIRO SAFE+ Hand 24 safety relay with 2 N/O contacts and 1 N/C contact	3000-33113-3020030
MIRO SAFE+ Step 24 safety relay with 3 N/O contacts and 1 N/C contact	3000-33113-3020050
MIRO SAFE+ T 2 24 safety relay with 3 N/O contacts and 2 N/O contacts delayed	3000-33113-3020060
MIRO SAFE+ T 1 24 safety relay with 2 N/O contacts and 1 N/O contact delayed	3000-33113-3020065
MIRO SAFE+ E 24 safety relay expansion module with 4 N/O contacts and 2 N/C contacts	3000-33113-3020075

EXACT12 SAFETY

Description	Art.-No.
Exact12 Safety base module, 4 ports M12 5-pin, pins wired 1:1 to terminal	8000-94702-0000000
Exact12 Connection cap with spring clamp terminals (21 pole)	8000-84749-0000000
Exact12 Safety base module, ports 1-4: M12 5-pin LED, p. 5-8: M12 3-pin 1:1 no LED	8000-98700-0000000
Exact12 Safety pre-wired cap with terminals, 3 m PUR	8000-98749-4080300
Exact12 Safety pre-wired cap with terminals, 5 m PUR	8000-98749-4080500
Exact12 Safety pre-wired cap with terminals, 7 m PUR	8000-98749-4080700
Exact12 Safety pre-wired cap with terminals, 10 m PUR	8000-98749-4081000
Exact12 Safety pre-wired cap with terminals, 15 m PUR	8000-98749-4081500
Exact12 Safety pre-wired cap with terminals, 20 m PUR	8000-98749-4082000
Exact12 Safety pre-wired cap with terminals, 25 m PUR	8000-98749-4082500
Exact12 Safety with homerun cable + terminals, ports 1-4: M12 5-pin LED, p. 5-8: M12 3-pin 1:1 no LED, 3 m PUR/PVC	8000-98710-4070300
Exact12 Safety with homerun cable + terminals, ports 1-4: M12 5-pin LED, p. 5-8: M12 3-pin 1:1 no LED, 5 m PUR/PVC	8000-98710-4070500
Exact12 Safety with homerun cable + terminals, ports 1-4: M12 5-pin LED, p. 5-8: M12 3-pin 1:1 no LED, 10 m PUR/PVC	8000-98710-4071000
Exact12 Safety with homerun cable + terminals, ports 1-4: M12 5-pin LED, p. 5-8: M12 3-pin 1:1 no LED, 15 m PUR/PVC	8000-98710-4071500
Exact12 Safety with homerun cable, ports 1-4: M12 5-pin LED, p.5-8: M12 4 pin no LED, 5 m PUR/PVC	8000-987A0-4070500
Exact12 Safety with rear connection, ports 1-4: M12 5-pin LED, ports 5-8: M12 4/3-pin 1:1 no LED	8000-98790-0000000
Accessory: Pluggable Service Adapter for setup, check and troubleshooting (for transfer module 596154)	596153
Accessory: Transfer module for DIN rail mounting	596154

E-STOP DISTRIBUTION BOX

Description	Art.-No.
Safety Wiring System, 8-way distribution box with cap, without electrical feedback	8000-98752-0000000
Safety Wiring System, 8-way distribution box with cap, with electrical feedback	8000-98750-0000000
Accessory: M12 Bridge Blind Plug for Safety Wiring Systems	332779

E-STOP AND RESET BUTTON

Description	Art.-No.
E-Stop Button, 2 N/C, width 42 mm, M12 connection (4-pin)	69000
E-Stop Button, 2 N/C, width 42 mm, M12 connection (5-pin)	69001
E-Stop Button with illumination, 2 N/C, width 42 mm, M12 connection (8-pin)	69002
E-stop/Reset Button, 2 N/C, 1 N/O, width 42 mm, M12 connection (8-pin)	69003
E-Stop with illumination Button, 2 N/C, 1 N/O, width 42 mm, M12 connection (8-pin)	69004
Reset Button, 1 N/O, width 42 mm, M12 connection (4-pin)	69010
2 Reset Button, 2 N/O, width 42 mm, M12 connection (4-pin)	69011
2 Reset Button with illumination, 2 N/O, width 42 mm, M12 connection (8-pin)	69012
Reset Button with illumination, 1 N/O, width 42 mm, M12 connection (4-pin)	69013
E-Stop Button, 2 N/C, width 72 mm, M12 connection (4-pin)	55550
E-Stop Button, 2 N/C, width 72 mm, M12 connection (5-pin)	69041
E-Stop Button with protective collar, 2 N/C, width 72 mm, M12 connection (5-pin)	69042
E-Stop Button with protective collar, 2 N/C, width 72 mm, M12 connection (4-pin)	69040
E-Stop Button with illumination, 2 N/C, width 72 mm, M12 connection (8-pin)	69043

ADAPTOR & T-COUPLER



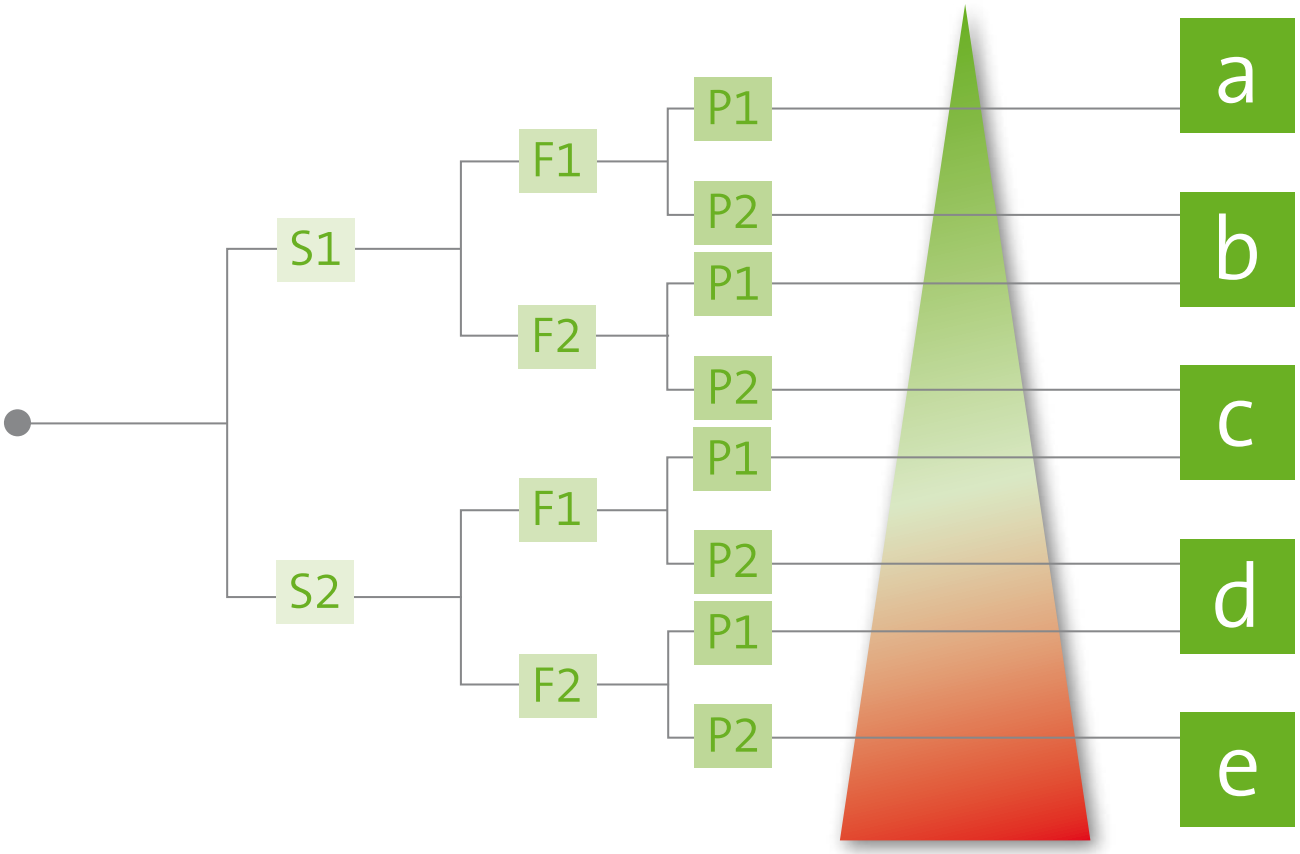

Description	Art.-No.
Adaptor M12 male / M12 female shielded AIDA	7030-42291-0000000
Adaptor M12 male / M12 female shielded for PIN adjustment (2-4/4-2/3-5)	333497
T-coupler (SlimLine) for connection of M12 8-pin devices at MVK Metal Safety	7030-42602-0000000
T-coupler (SlimLine) for connection of M12 8-pin Pilz Sensoren (z.B. PSEN sl-0.5p, sl-1.0p, cs3.1p, cs4.1p) at MVK Metal Safety module	7030-42603-0000000
T-coupler (SlimLine) for connection of M12 8-pin Euchner CES-A-... sensors at MVK Metal Safety module	7030-42642-0000000
T-coupler (SlimLine) for connection of M12 8-pin Euchner CETx-AP-..., CTP-AP-... sensors at MVK Metal Safety module	7030-42662-0000000
T-coupler (SlimLine) for connection of M12 8-pin Schmersal AZM400 sensors at MVK Metal Safety module	7030-42671-0000000
T-coupler (SlimLine) for connection of M12 8-pin E-Stop button at MVK Metal Safety module (not for article 69012)	7030-42622-0000000
T-coupler (SlimLine) for connection of 2 FDO (MVK Metal Safety) at Cube67 K3 module	7030-42612-0000000
T-coupler (SlimLine) M12 male 5p/2x M12 female 3p for connection of 2 one-channel sensors at one FDI port	7000-41155-0000000
T-coupler MASI with actuator cross input, for connection of AS-Interface and Power at MASI68 modules	7060-42701-0000000
Adaptor for connection of directional control valves at MVK Metal Safety module	342691
T-coupler (SlimLine) for connection of 69012	7030-42623-0000000
Buffer module for sensors (Pin 1-3) 24 VDC 94 µF	55110
Buffer module for actuators (Pin 4-3) 24VDC 11 µF	55112

Contact our technical support for more information on compatibility and other adapters.

M12 MALE/FEMALE


Description	Art.-No.
M12 MALE 0°/M12 FEMALE 0° 5-pin AIDA connection cable, PUR 5X0.34 yellow UL/CSA, 0.3 m	7030-40041-1260030
M12 MALE 0°/M12 FEMALE 0° 5-pin AIDA connection cable, PUR 5X0.34 yellow UL/CSA, 0.6 m	7030-40041-1260060
M12 MALE 0°/M12 FEMALE 0° 5-pin AIDA connection cable, PUR 5X0.34 yellow UL/CSA, 1 m	7030-40041-1260100
M12 MALE 0°/M12 FEMALE 0° 5-pin AIDA connection cable, PUR 5X0.34 yellow UL/CSA, 1.5 m	7030-40041-1260150
M12 MALE 0°/M12 FEMALE 0° 5-pin AIDA connection cable, PUR 5X0.34 yellow UL/CSA, 2 m	7030-40041-1260200
M12 MALE 0°/M12 FEMALE 0° 5-pin AIDA connection cable, PUR 5X0.34 yellow UL/CSA, 3 m	7030-40041-1260300
M12 MALE 0°/M12 FEMALE 0° 5-pin AIDA connection cable, PUR 5X0.34 yellow UL/CSA, 4 m	7030-40041-1260400
M12 MALE 0°/M12 FEMALE 0° 5-pin AIDA connection cable, PUR 5X0.34 yellow UL/CSA, 5 m	7030-40041-1260500
M12 MALE 0°/M12 FEMALE 0° 4-pin AIDA connection cable, PUR 4X0.34 black UL/CSA, 0.3 m	7030-40021-6340030
M12 MALE 0°/M12 FEMALE 0° 4-pin AIDA connection cable, PUR 4X0.34 black UL/CSA, 0.6 m	7030-40021-6340060
M12 MALE 0°/M12 FEMALE 0° 4-pin AIDA connection cable, PUR 4X0.34 black UL/CSA, 1 m	7030-40021-6340100
M12 MALE 0°/M12 FEMALE 0° 4-pin AIDA connection cable, PUR 4X0.34 black UL/CSA, 1.5 m	7030-40021-6340150
M12 MALE 0°/M12 FEMALE 0° 4-pin AIDA connection cable, PUR 4X0.34 black UL/CSA, 2 m	7030-40021-6340200
M12 MALE 0°/M12 FEMALE 0° 4-pin AIDA connection cable, PUR 4X0.34 black UL/CSA, 3 m	7030-40021-6340300
M12 MALE 0°/M12 FEMALE 0° 4-pin AIDA connection cable, PUR 4X0.34 black UL/CSA, 4 m	7030-40021-6340400
M12 MALE 0°/M12 FEMALE 0° 4-pin AIDA connection cable, PUR 4X0.34 black UL/CSA, 5 m	7030-40021-6340500

- Each system represents a risk
- The risk cannot be too high; it must be tolerable
- The risk graph is a method to evaluate a system and/or its components
- The goal is to find the point where the risk caused by the system and/or its components is tolerable
- The process is qualitative; it doesn't require any time-consuming evaluation of statistics
- The process is intuitive



RISK PARAMETERS

SEVERITY OF THE INJURY

S1	Minor, reversible injury
S2	Severe injury/death

FREQUENCY AND/OR TIME OF EXPOSURE

F1	Rare to less frequent and/or short duration of exposure
F2	Frequent to continuous and/or long duration of exposure

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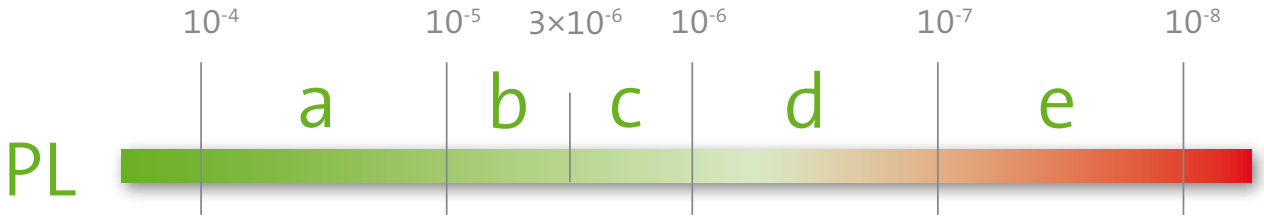
RISK GRAPH ACCORDING TO EN ISO 13849-1

Performance Level as safety-related reliability

PROBABILITY OF A DANGEROUS FAILURE PER HOUR



PROTECTION FROM LOW RISKS

PROTECTION FROM HIGH RISKS

Murrelektronik provides SISTEMA libraries for faster and easier calculation of the reliability values (including Performance Level). Each customer is responsible for conducting a risk assessment on the equipment to determine the required safety level.

POSSIBILITY OF HAZARD AVOIDANCE OR LIMITED DAMAGE

P1 Hazard prevention possible under certain circumstances

P2 Hazard prevention almost impossible

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