

**Networking sensors.  
Distributing safety.  
Reducing automation cost.**

Product Overview AS-Interface

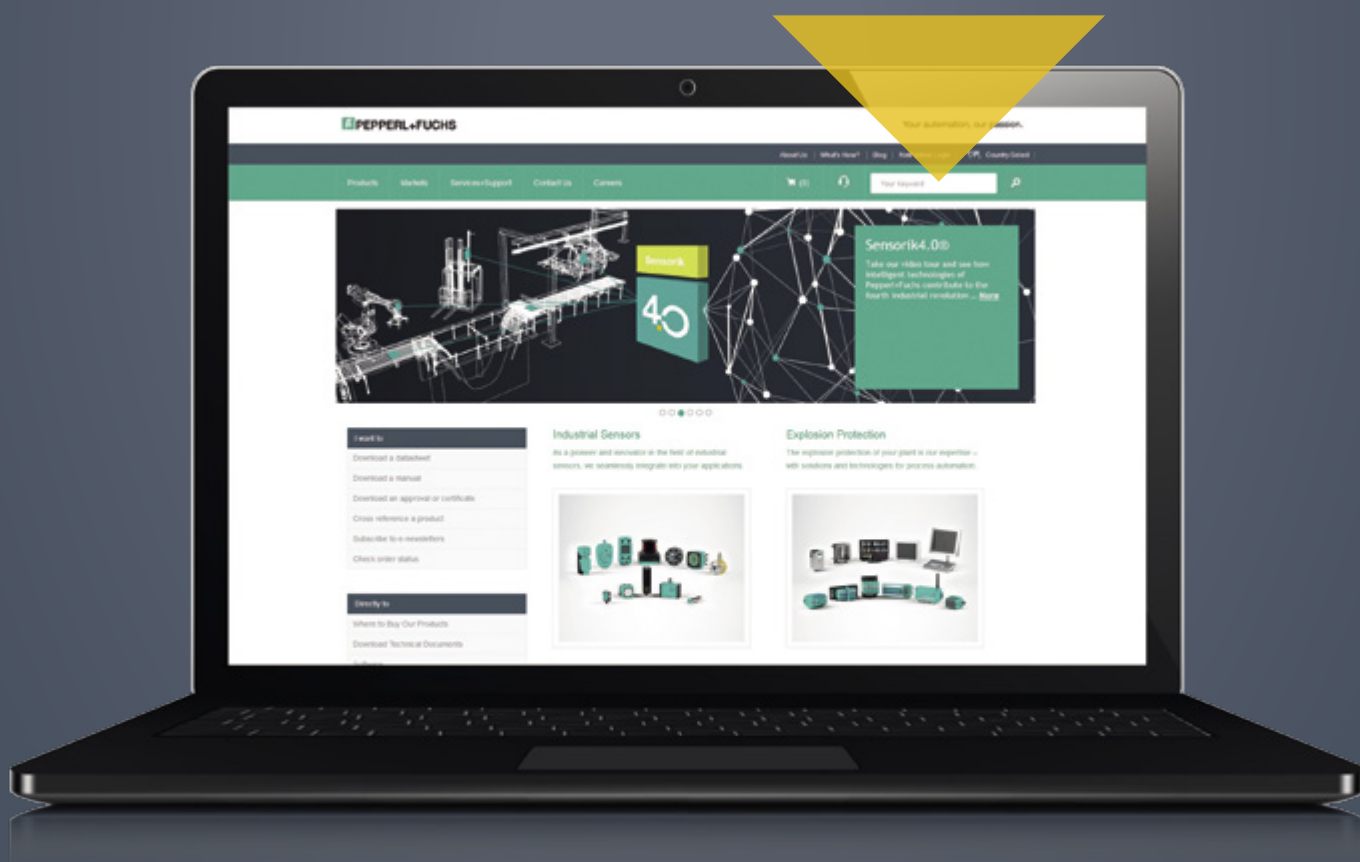


Your automation, our passion.

 **PEPPERL+FUCHS**

# How to use the Short Links

Just insert **#keyword** in the search field on our website and push 'enter'. You will directly get a selection of appropriate products.



# Why Use AS-Interface?

AS-Interface (actuator-sensor interface) is an industrial network solution specifically designed for simplicity, flexibility, and reliability.

Easy decentralized installation replaces the clutter, disorder and the frustration that comes with traditional cabling methods. The network connects your lowest level I/O devices such as discrete I/O, sensors, analog and safety data, encoders, light curtains, and e-stops to a single network cable.

It's all about simplifying the design of a control system, reducing wiring complexity, cutting installation costs, improving diagnostics, and ultimately making automation more productive.

## Successful low-level I/O network

- Cost effective low-level networking solution
- Millions of AS-Interface field devices installed worldwide
- Supports transmitting standard and safe signals on one cable

## Simplicity with a single cable

- One, two-conductor cable connects I/O modules from any manufacturer
- Efficient installation method
- Cable design eliminates the danger of reversing polarity

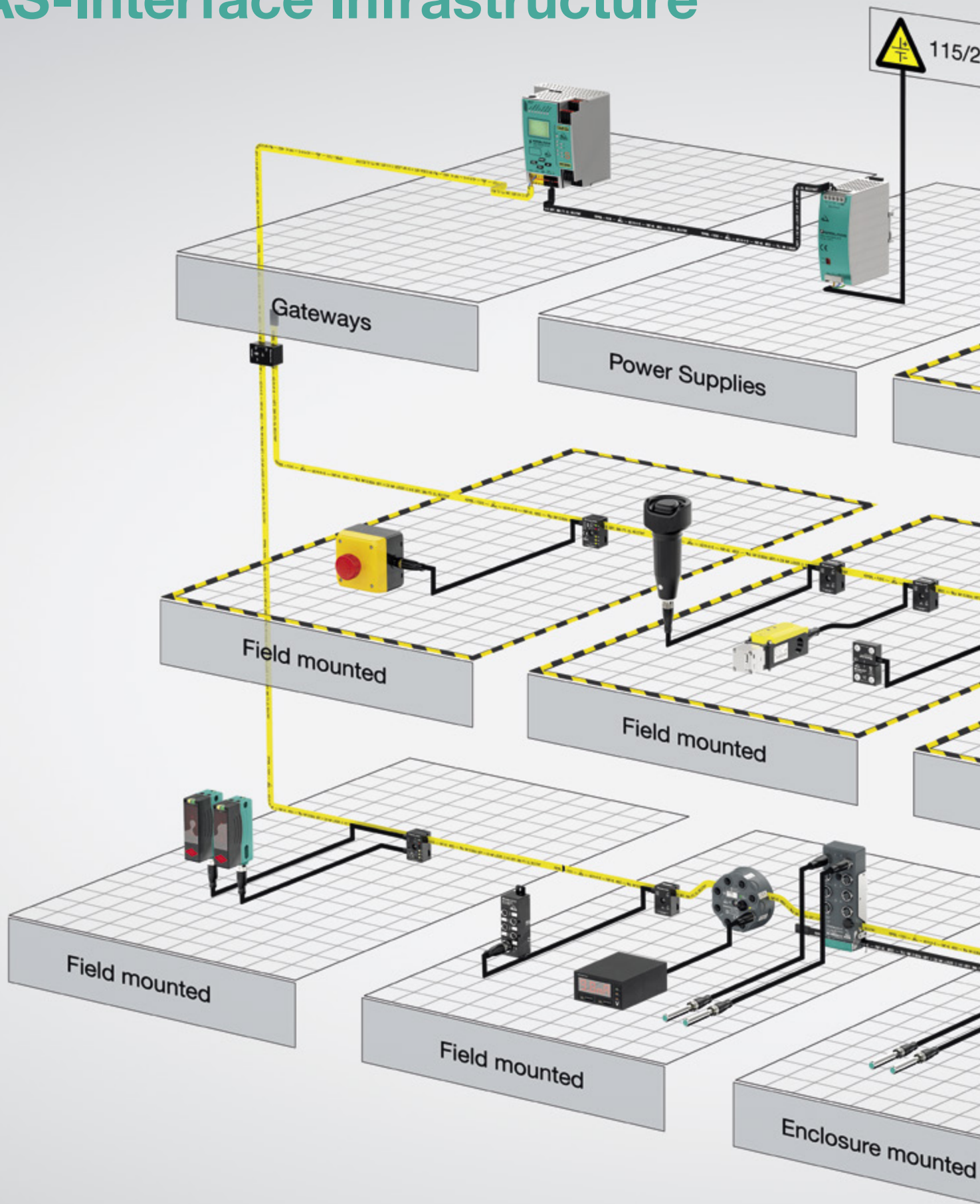
## Flexible and efficient

- Enables use of any network topology
- No limitations on how to route, expand, or split network runs
- Easily integrated into a larger fieldbus network
- Adding or removing modules has never been easier without disrupting the network
- Supported by just about every industrial PLC manufacturer

## Reliable technology guaranteed

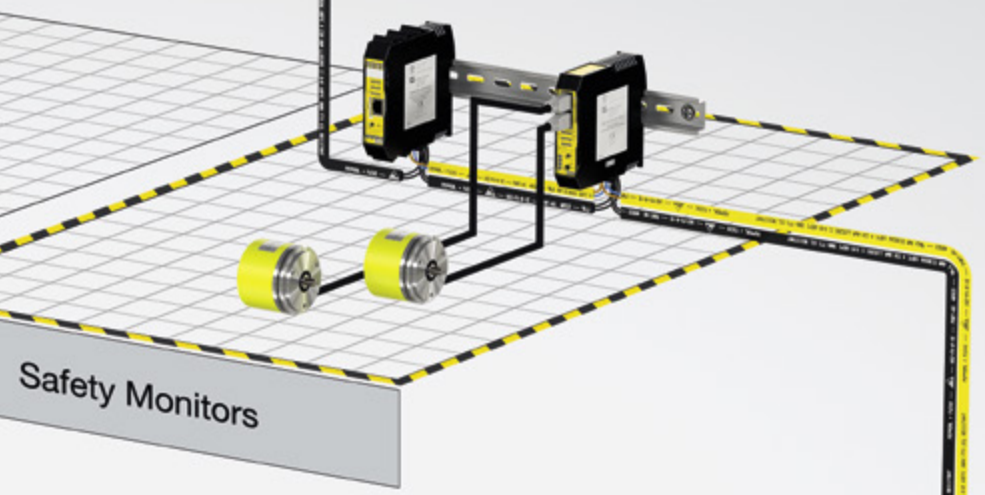
- Piercing connection technology cannot be beaten in terms of simplicity and connectivity of devices
- Piercing needles on modules penetrate the conductors of the cable
- Robust and secure electrical connection

# AS-Interface Infrastructure

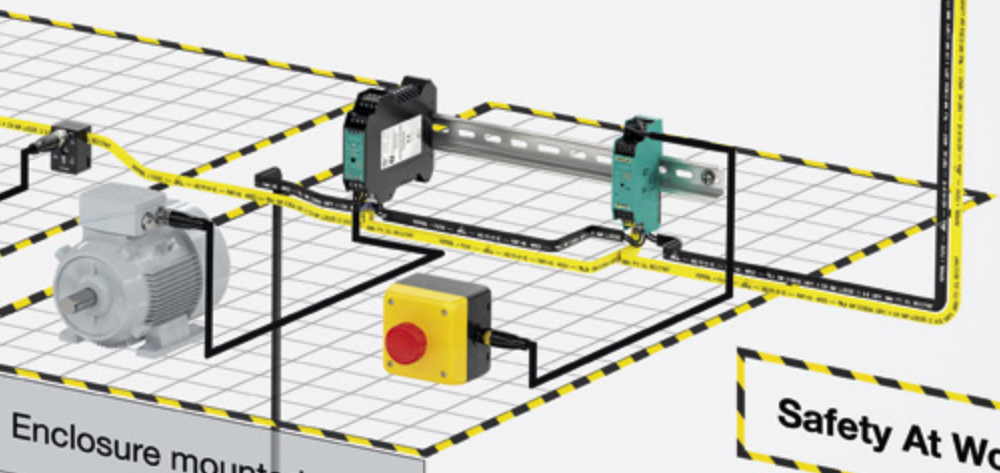


30V

 +24 V

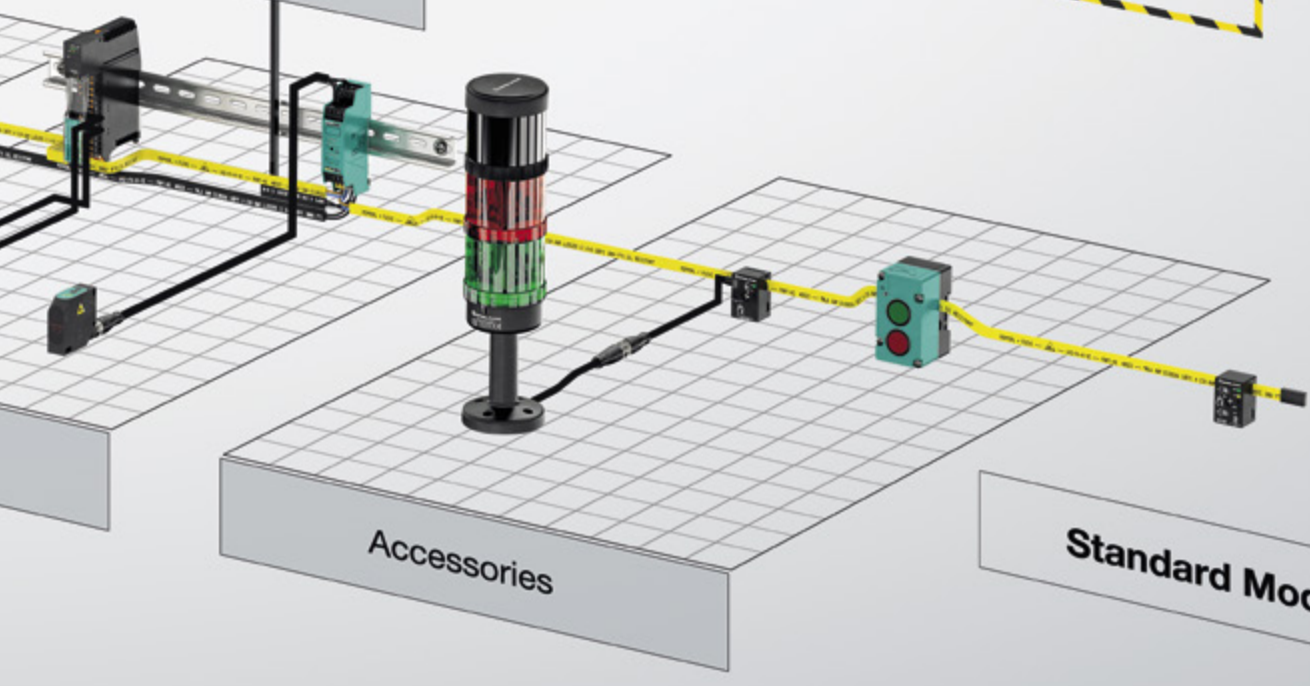


Safety Monitors



Enclosure mounted

**Safety At Work Modules**



Accessories

Standard Modules

# Target Markets for AS-Interface

## Material Handling Industry

AS-Interface products are a dependable option for the Material Handling Industry where applications demand fast and reliable networks.

## Automotive Industry

AS-Interface products are often the technology of choice in the Automotive Industry where equipment must support lean, flexible manufacturing and provide speed, simplicity, and reliability in I/O networking.

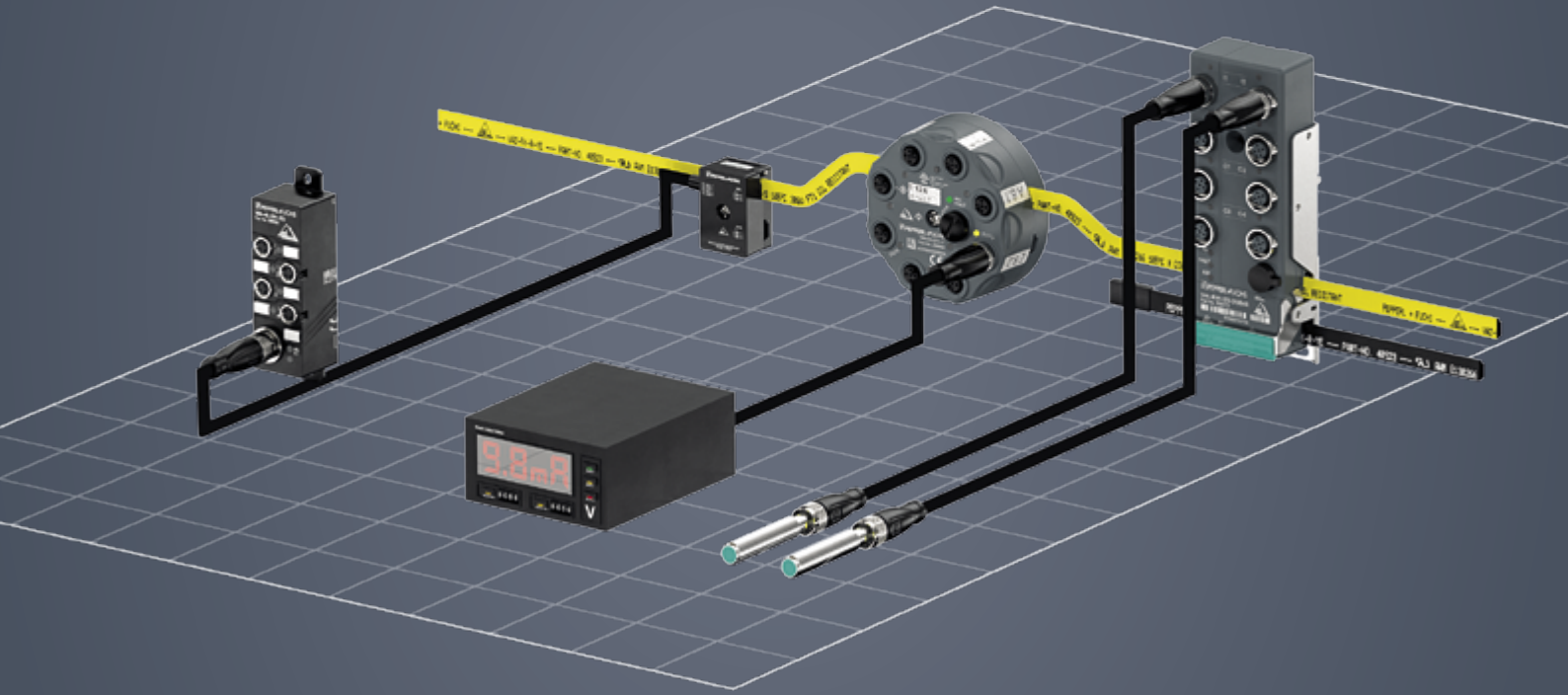


## Process Industry

AS-Interface products are frequently used in Process Industries (chemical plants, paint production, pharmaceuticals) where modules for hazardous areas are required.



# Input/Output Modules for Field Mounted Applications



Pepperl+Fuchs offers modules with rugged housings and high IP ratings for a wide range of field applications where cost savings, installation time, and module size are crucial. Each module uses high-quality, machined, gold-plated piercing contacts that provide superior long-term contact stability without damaging the internal strands of the AS-Interface cable.





G10 modules not only mount easily in tight locations but also perfectly address applications where inputs and outputs are highly distributed.

#G10

G10 modules have a one-piece housing which mounts in seconds. Insert the flat cable, close the top, and tighten the screw. Connect and done!



G11 modules offer an innovative seal concept in a robust, compact, round design and are particularly suitable for machine builders and harsh and process environments.

#G11



G12 modules have a one-piece, flat housing that are extremely easy to connect and replace with no tools.

#G12



G16 modules are specifically designed for installation and use where space is limited.

#G16

### G10 ultra compact module

- Simple and cost-effective mounting concept
- Single-piece housing
- No loose parts, nothing to lose or assemble
- Mounting is possible even in confined spaces
- Any sensor or actuator becomes an “AS-Interface device”
- Ideal for heavily distributed I/O systems with up to three I/O per location

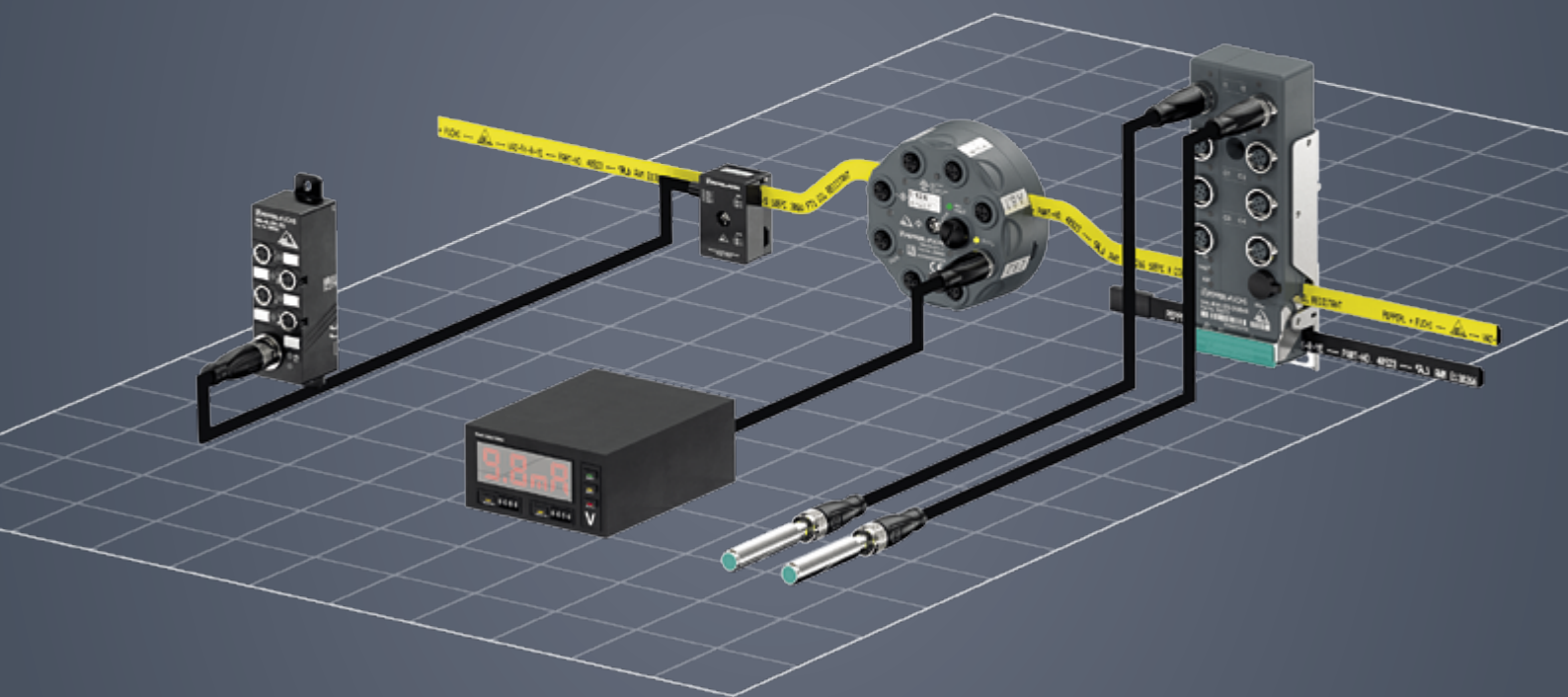
### G11, G12, G16 modules – minimal or tool-free installation

- Easy to mount or replace with minimal tools needed
- Modules distinguish themselves by their mechanics and I/O configuration options
- Variety of mounting types based on application needs
- Multiple input/output connections with an LED to indicate the presence of a fault
- Diagnostic features available for output overload/short-circuit indication
- Analog versions of modules available

How to use the shortlinks see page 2.

More information is available at [www.pepperl-fuchs.com/AS-Interface](http://www.pepperl-fuchs.com/AS-Interface)

# Input/Output Modules for Field Mounted Applications





G4 modules are unique, with cabling routing from bottom of module, ensuring cleaner installations.

#G4

G20 modules are effective for controlling DC motor rollers in modern, energy-efficient conveyor applications.

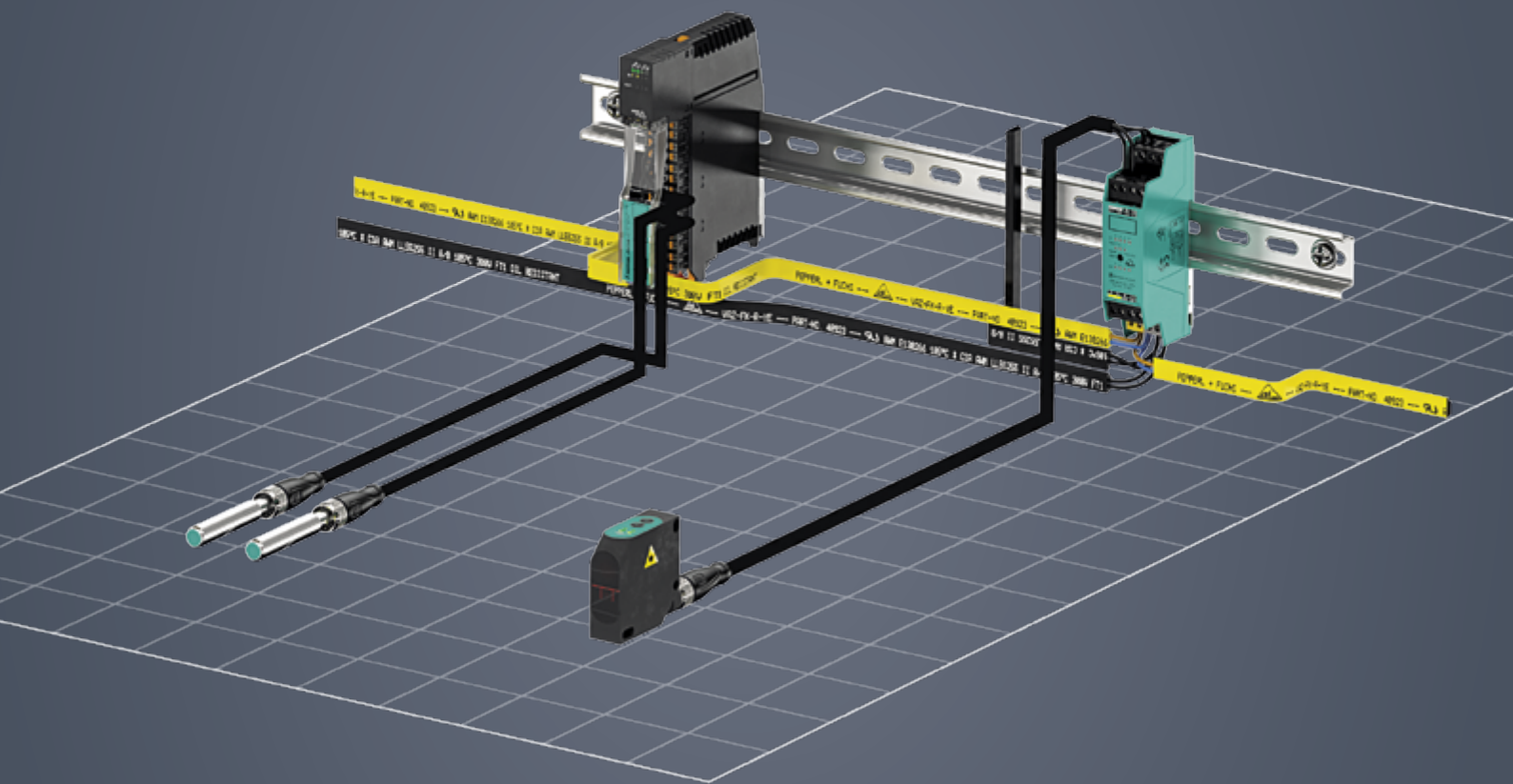
#### G4 module – cord grip

- Internal cage tension spring terminals enable you to cut the cable to the exact length
- Module fits directly on top of programmer without cable
- Mounting through holes or DIN rail

#### G20 module – intelligent DC motor control

- DC motor roller module version available to control all motor functions
- Digital pneumatic version available for simple on/off functions
- Modules are easily split into manageable segments – pre-assembled, ready to be transported and tested

# Input/Output Modules for Enclosure Mounted Applications



Pepperl+Fuchs offers modules that fit in small control cabinets. They feature a narrow profile that uses a minimal amount of space. For easy installation, all enclosure modules have removable, mechanical, and color-coded terminals that support wire sizes up to 14 AWG for connection of the I/O. They have an IP20 protection rating and diagnostic LEDs to minimize troubleshooting and maximize runtime.



KE5 modules are simple to handle and designed with compact housing achieving up to 50% space savings.

#KE5



Input/output channels are LED back illuminated including channel specific overload indications.



Front push-in connector simplifies installation.

### KE5 enclosure mount modules with push-in technology

- Front side push-in connection for easy mounting
- Backlit I/O identification and status-indication LEDs
- Transparent cover – making all labels visible at all times
- Individually removable connectors enabling simple removal of single terminals
- Functionally safe – modules can be used for safety applications
- Cleaner machine design – cables are hidden behind the cover
- AS-Interface or AUX power – easily selectable



KE1 modules are ideal for compact junction boxes where height may be limited.

#KE1

### KE1 enclosure mount modules for junction boxes

- Easy mounting by snapping onto DIN rail
- LEDs on front control plate display current switching state for each input

How to use the shortlinks see page 2.

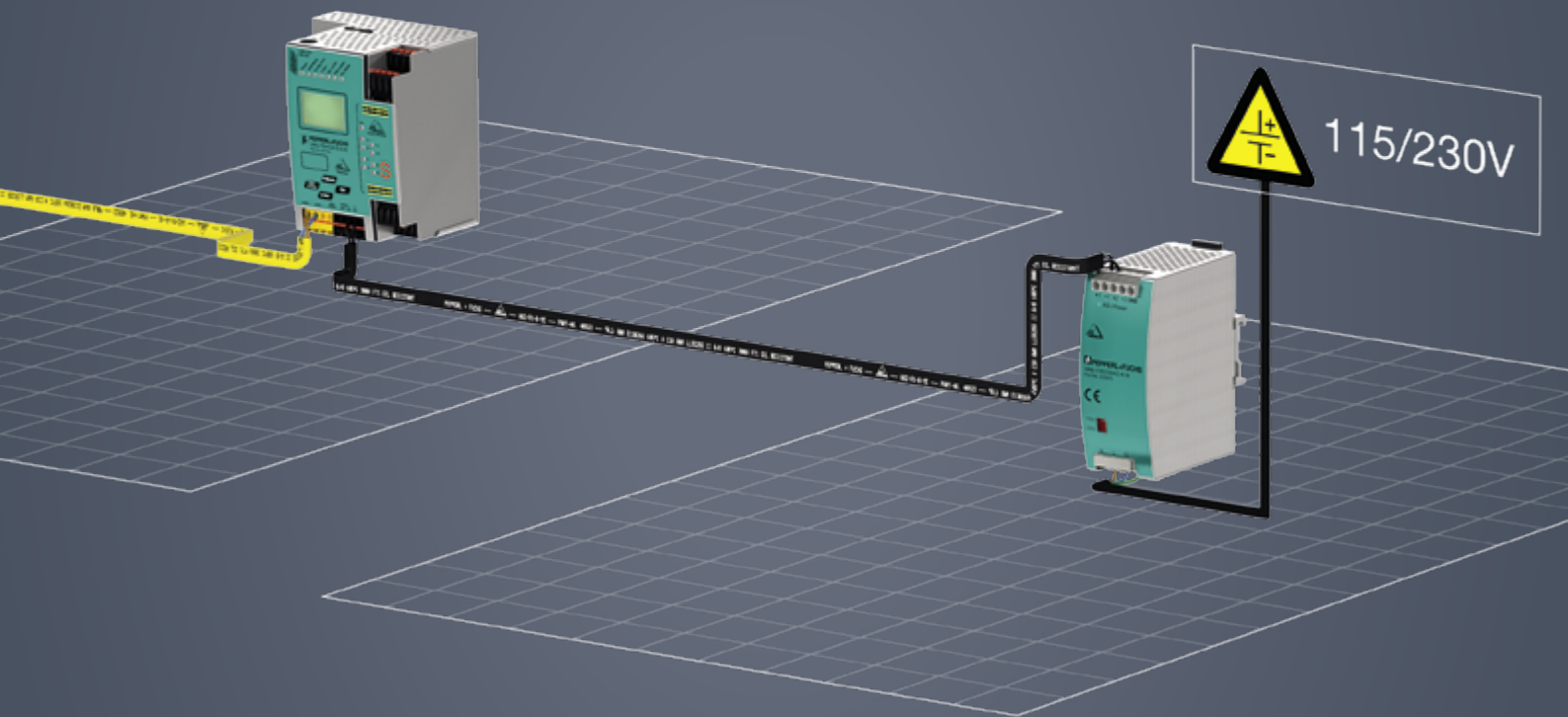
More information is available at [www.pepperl-fuchs.com/AS-Interface](http://www.pepperl-fuchs.com/AS-Interface)

# Gateways and Power Supplies





# Gateways and Power Supplies



Pepperl+Fuchs offers gateways for all standard buses such as: Ethernet/IP, Profinet, PROFIBUS, DeviceNet and CC-Link. Gateways control the AS-Interface system and make the process data available to all higher-level networks of the PLC in a defined configuration.





Safety at Work gateways are available with gateway and safety monitor in one housing. These gateways provide connectivity to single or dual AS-interface networks.

#K30\_  
SAFETY

### Safety At Work Gateways

- Up to 31 safety modules per gateway
- Safe outputs onboard relay and electronic
- PLe, SIL3, CAT4 rated
- Best way to get safety diagnostics to PLC
- VAZ-SW-SUITE software required for configuration, diagnostics, and programming



Standard gateway characteristics include EFD (Earth Fault Detection), double address detection, and a simple diagnostics interface.

#K20

### Standard Gateways

- Single Network 62 nodes
- Dual Network 124 nodes
- LCD text display
- Integrated memory card
- Color-coded removable terminals
- Duplicate address detection
- Ground fault indication
- Noise detector
- Overvoltage indication
- Built in coils

### AS-Interface Power Supplies

- Power supplies are integral to any AS-Interface network
- Every AS-Interface network segment requires a power supply
- AS-Interface runs at 30.5VDC
- Power supplies are available from ~ 2.8A to 8A



AS-Interface power supplies are needed to decouple the power and data transferred on the same cable.

#Power

### What power supply is right for you?

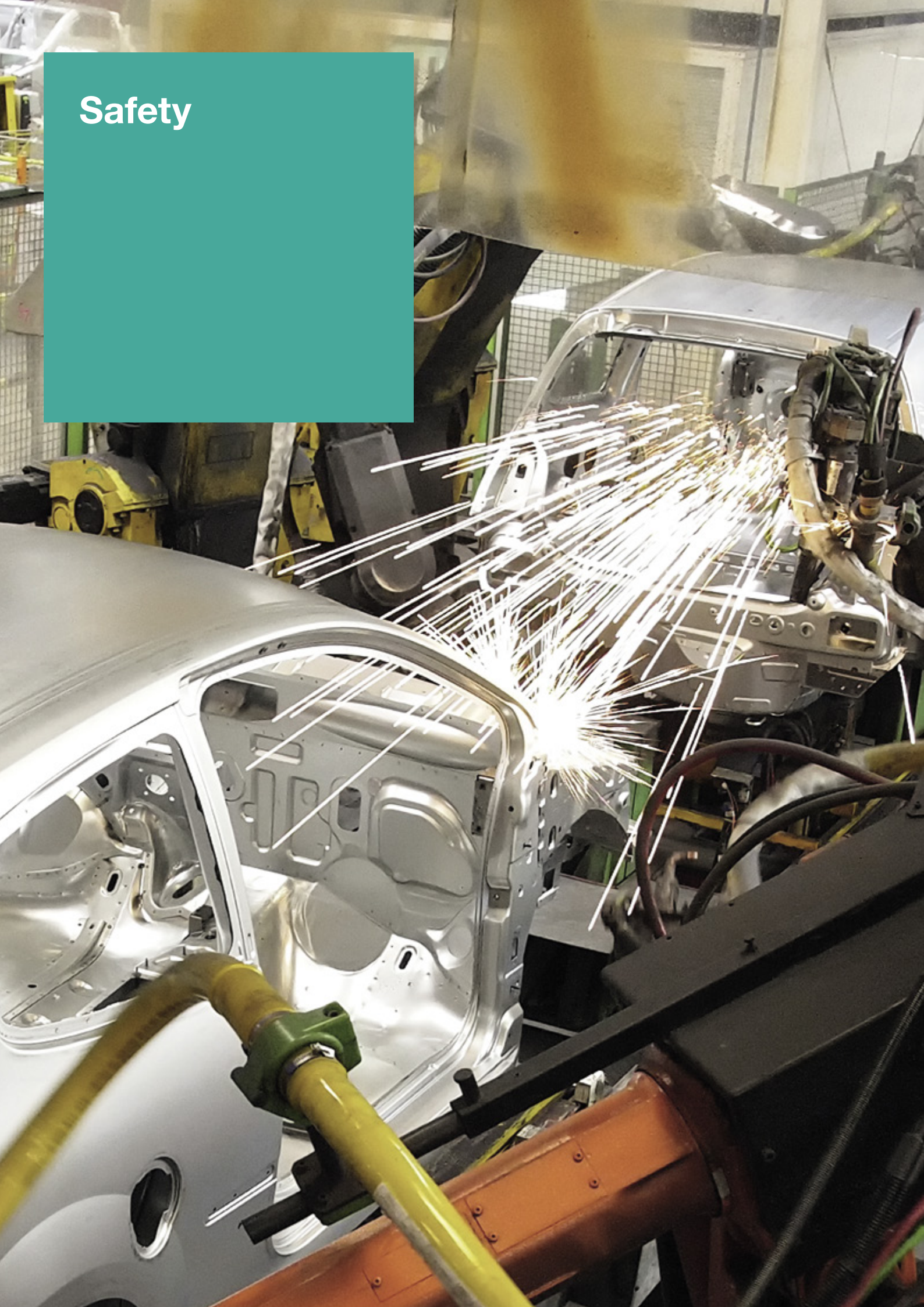
The AS-Interface network checking utility helps users choose the correct power supply, ensures that voltage drop has not been exceeded, and verifies the configuration of the AS-Interface network.

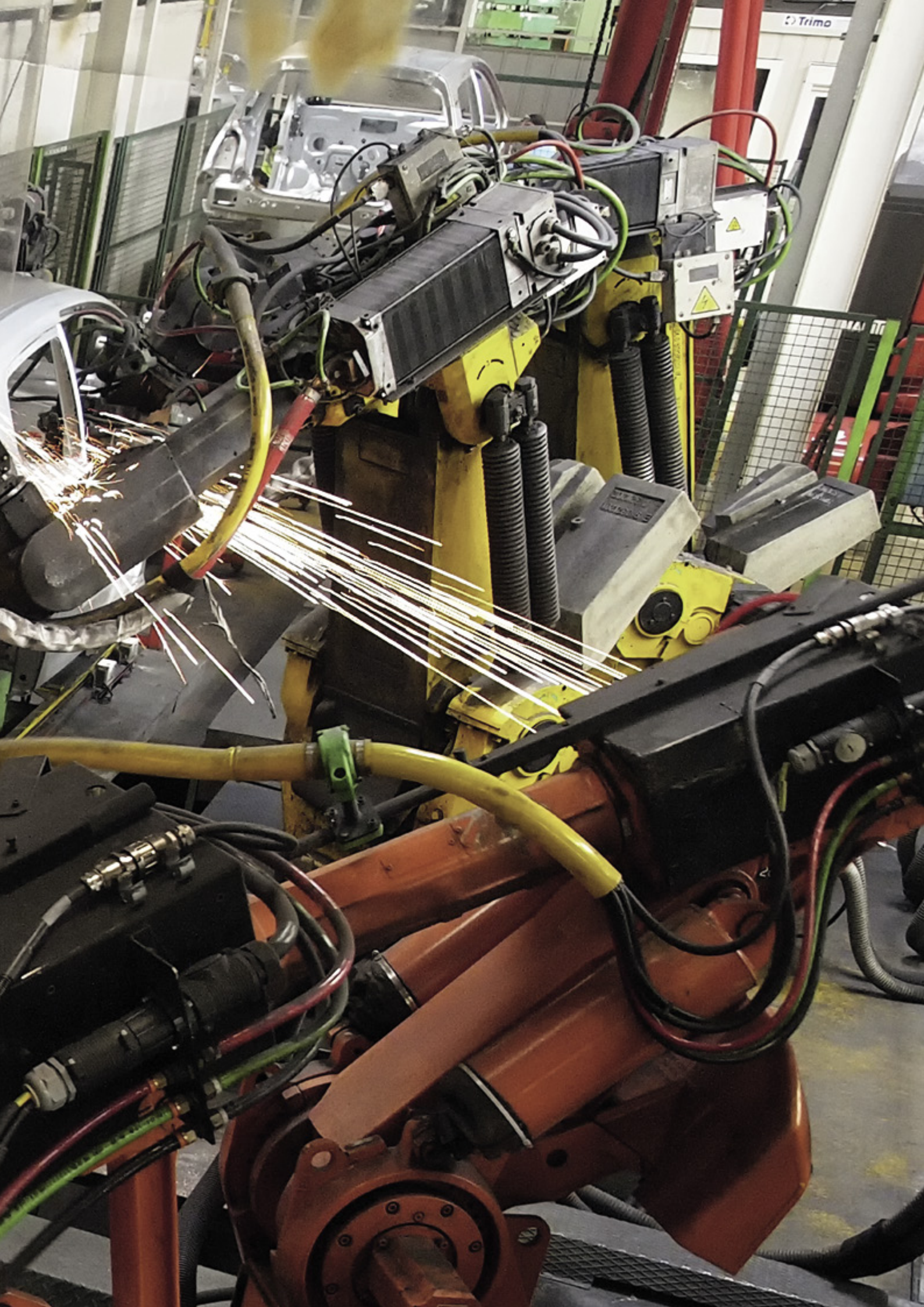
[www.pepperl-fuchs.com/sortiment/Power\\_calc](http://www.pepperl-fuchs.com/sortiment/Power_calc)



#Power\_calc

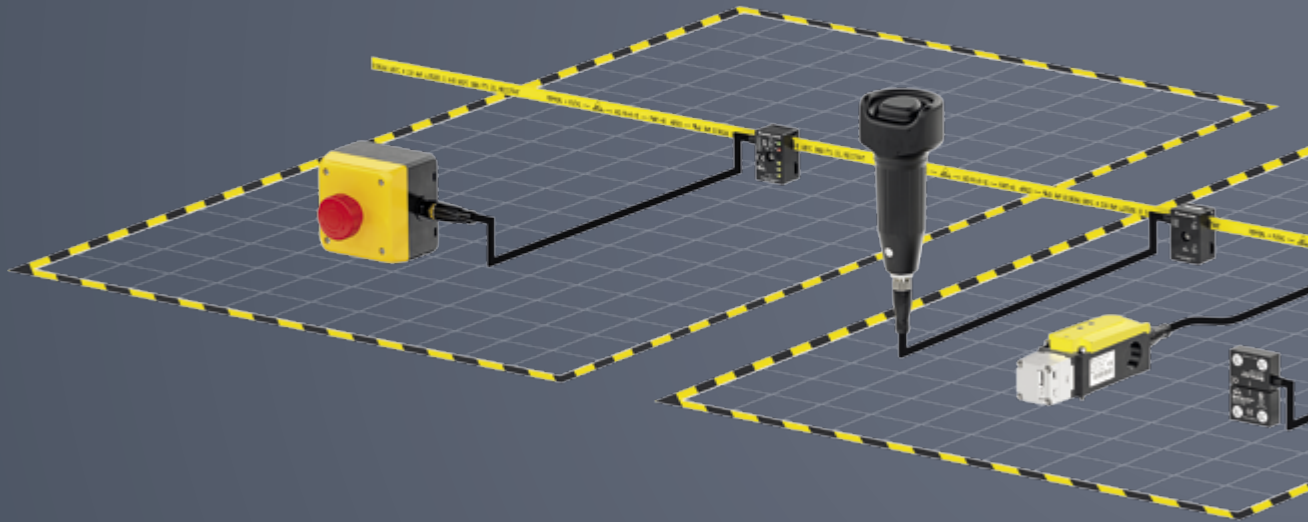
# Safety





# Why Safety at Work?

## AS-Interface with Integrated Safety



Pepperl-Fuchs offers AS-Interface with Integrated Safety. With Safety at Work, users can quickly implement a safety system that satisfies the rules and regulations needed to meet the most stringent safety requirements of PLe, SIL3, and EN ISO 13849 standard. Safety at Work can be added to any network, new or old. This is a level of backward compatibility and security that no other solution can offer and the reason why AS-Interface is “investment safe.”

### Benefits of AS-Interface Safety at Work

- Enables networking of safety devices (safety door switches, emergency stop pushbuttons, safety light curtains, etc.) using standard AS-Interface networks
- One network required to transfer safe and unsafe data
- Safety support up to highest Performance Levels
- Safety PLC not needed
- Automatic address replacement
- Up to 32 independent safe zones

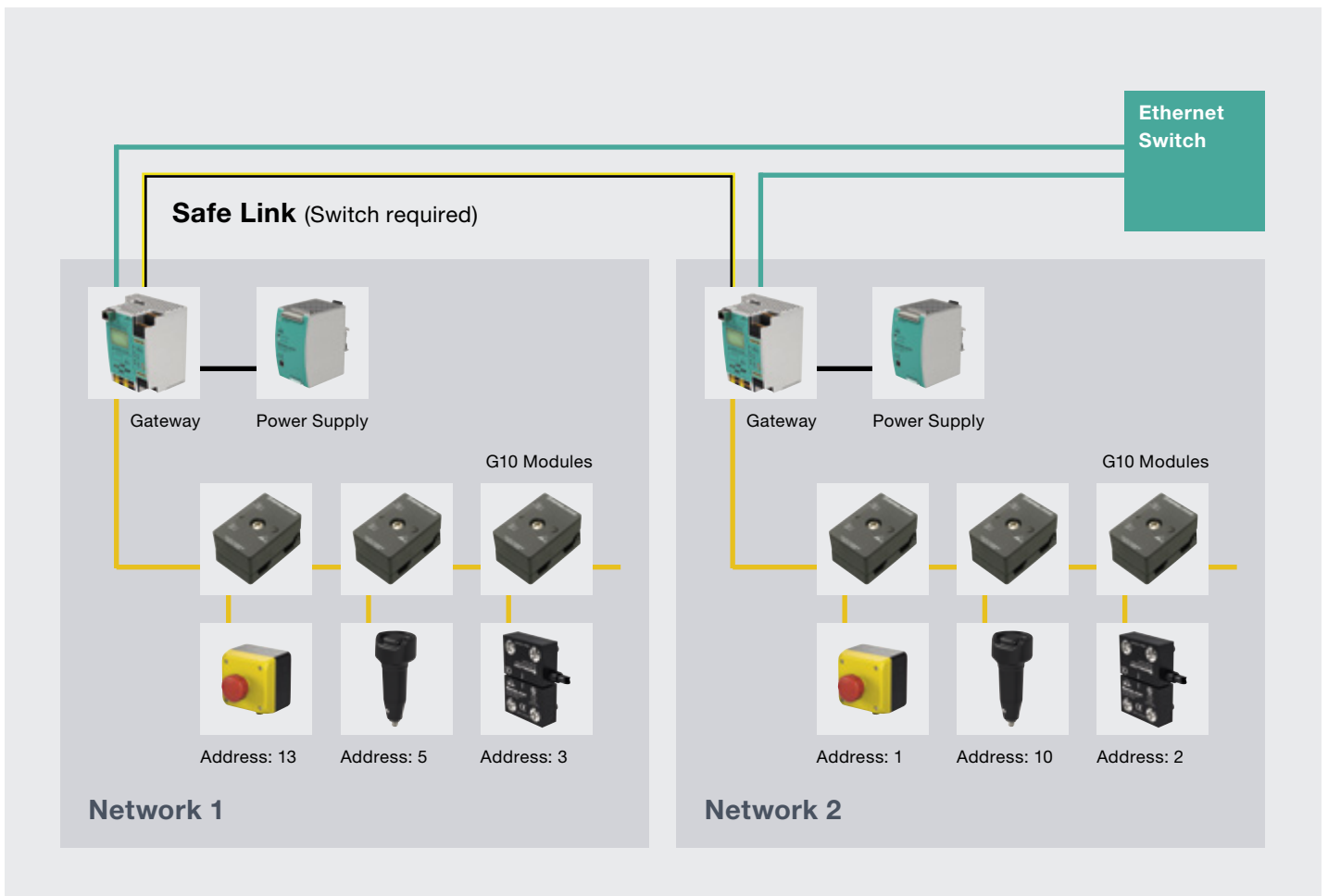
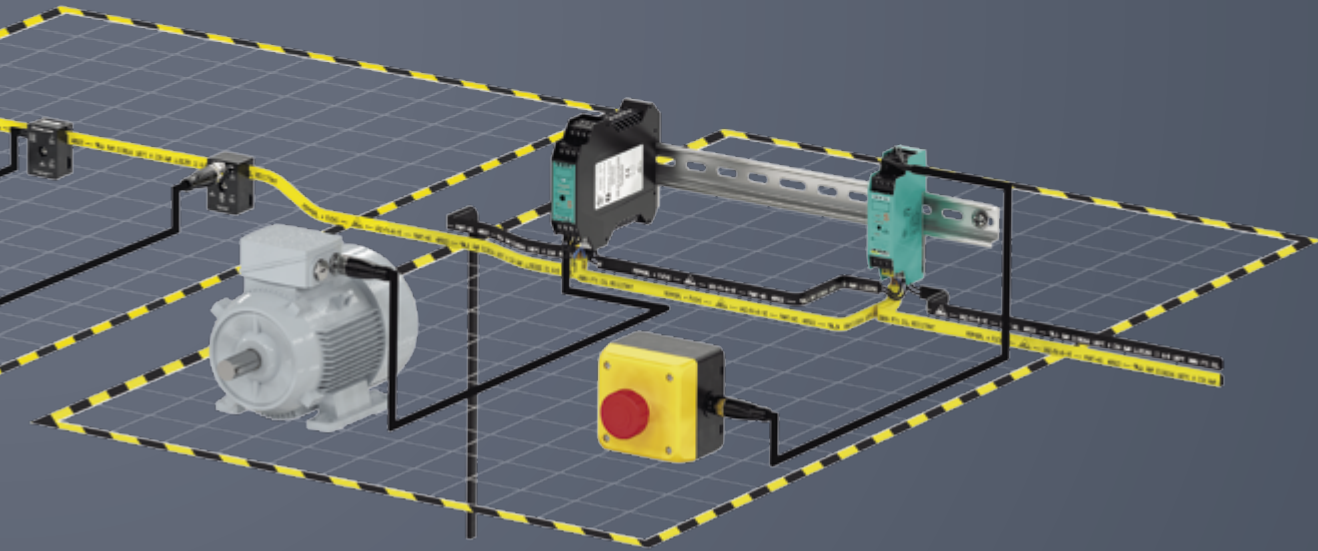
### Why Safe Link?

- Safe data sharing over Ethernet
- Interconnection of multiple safe networks
- Most efficient and cost-effective way to link safe signals from multiple AS-Interface networks

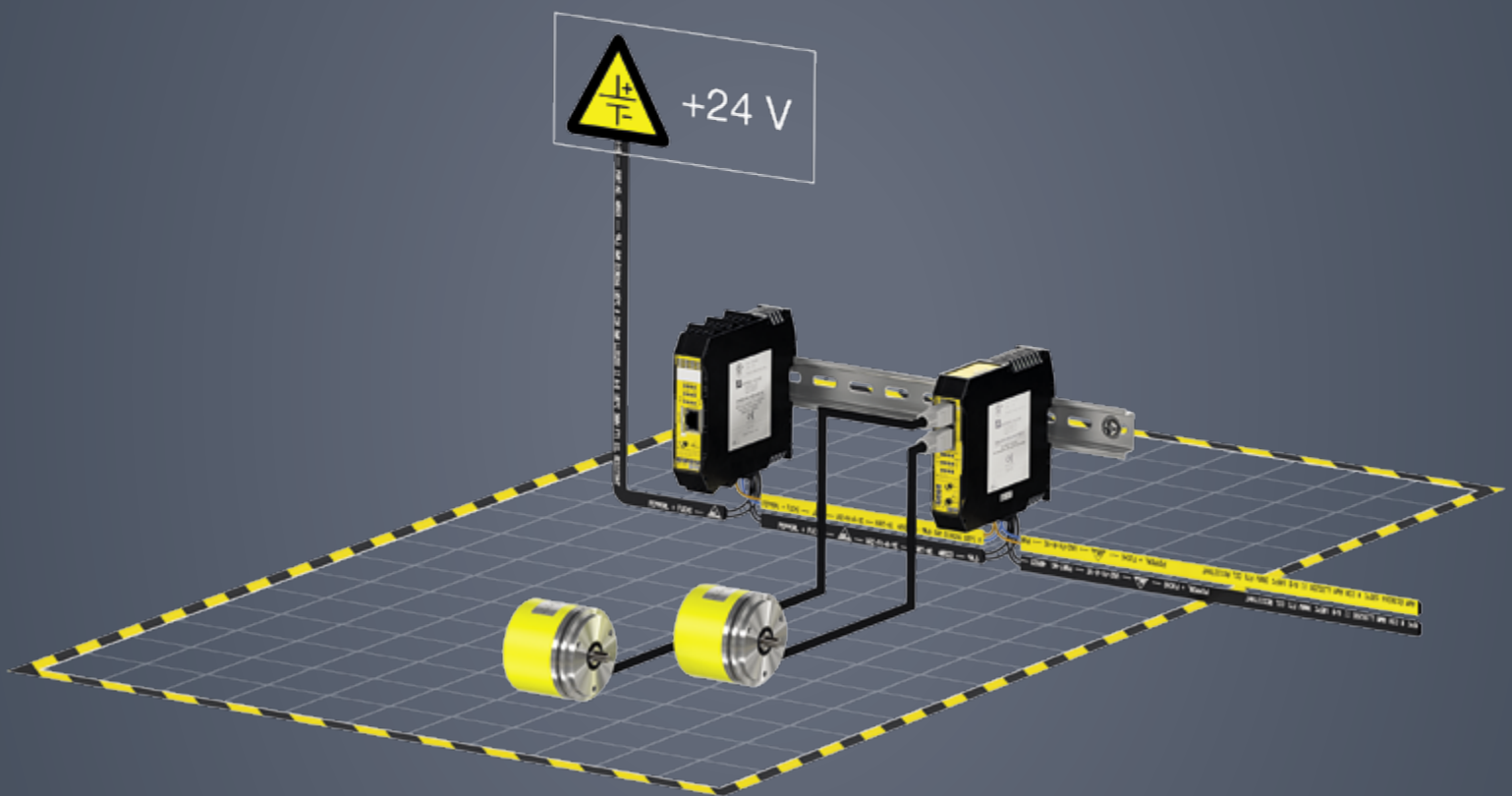
Safety relays have been used to safeguard machines and protect workers. The drawbacks of this approach are wiring complexity, the complete lack of useful diagnostics, nearly nonexistent flexibility, and ultimately, a high total cost of ownership.

### Configuration and Diagnostics

- Using the VAZ-SW-SUITE software drag & drop interface, the safety logic is defined by picking graphical function blocks from the device library.
- VAZ-SW-SUITE software offers exceptionally clear and intuitive diagnostics using the same graphical symbols used during the configuration: colors indicate operational states.
- System maintenance is simple due to the memory card and removable terminals. Simply replace the safety controller, move the memory card, and apply power.



# Safety Monitors



Pepperl-Fuchs offers Safety Monitors for AS-Interface Safety at Work which can be used as stand-alone devices or can be combined in a safety monitor/gateway combination. Stand alone safety monitors are a great way to achieve a low-cost, safe output on AS-Interface, because AS-Interface safety can be added to any network regardless of age or master type.



### KE4 Safety Monitor

- Can stand alone and replace safe Micro PLCs
- Can be added in an existing AS-Interface system where safety is desirable
- Memory card available for easy program transfer
- Safe coupling allows communication between safety monitors
- Equally valuable when third party AS-Interface gateway (that do not support safety) exist on the AS-Interface network
- VAZ-SW-SUITE software required for configuration, diagnostics, and programming



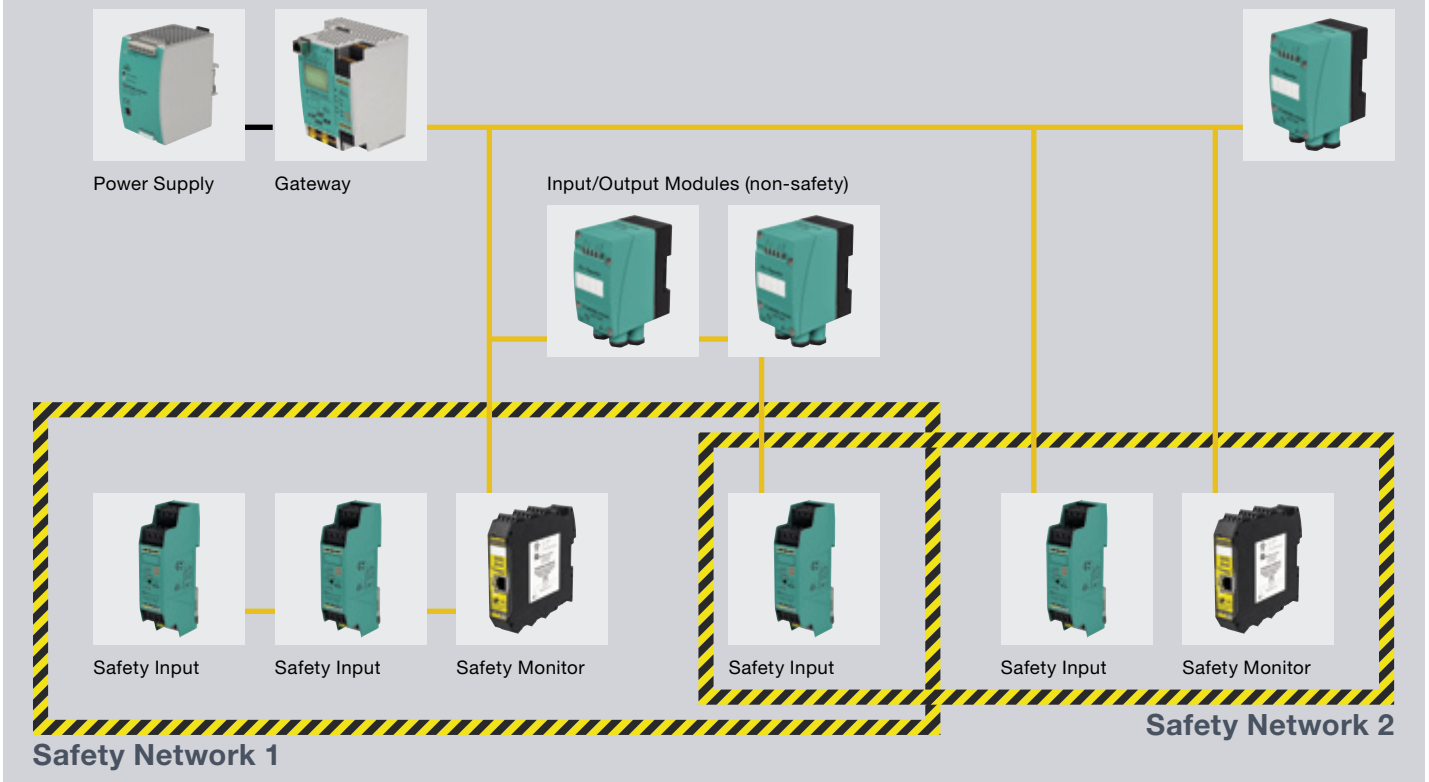
KE4 safety monitors are ideal for applications where you would like to introduce safety into an existing system where there is no AS-Interface gateway.

#Monitors

How to use the shortlinks see page 2.

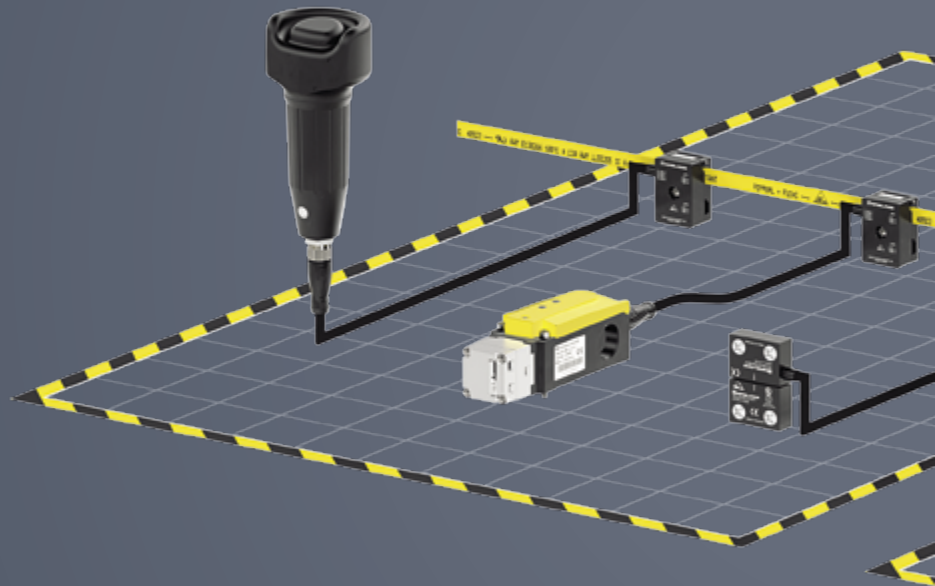
More information is available at [www.pepperl-fuchs.com/AS-Interface](http://www.pepperl-fuchs.com/AS-Interface)

## Networked Safety with AS-Interface Safety at Work



Multiple KE4 Safety Monitors can monitor the same safety input module on AS-Interface.

# Safety Input and Output Modules

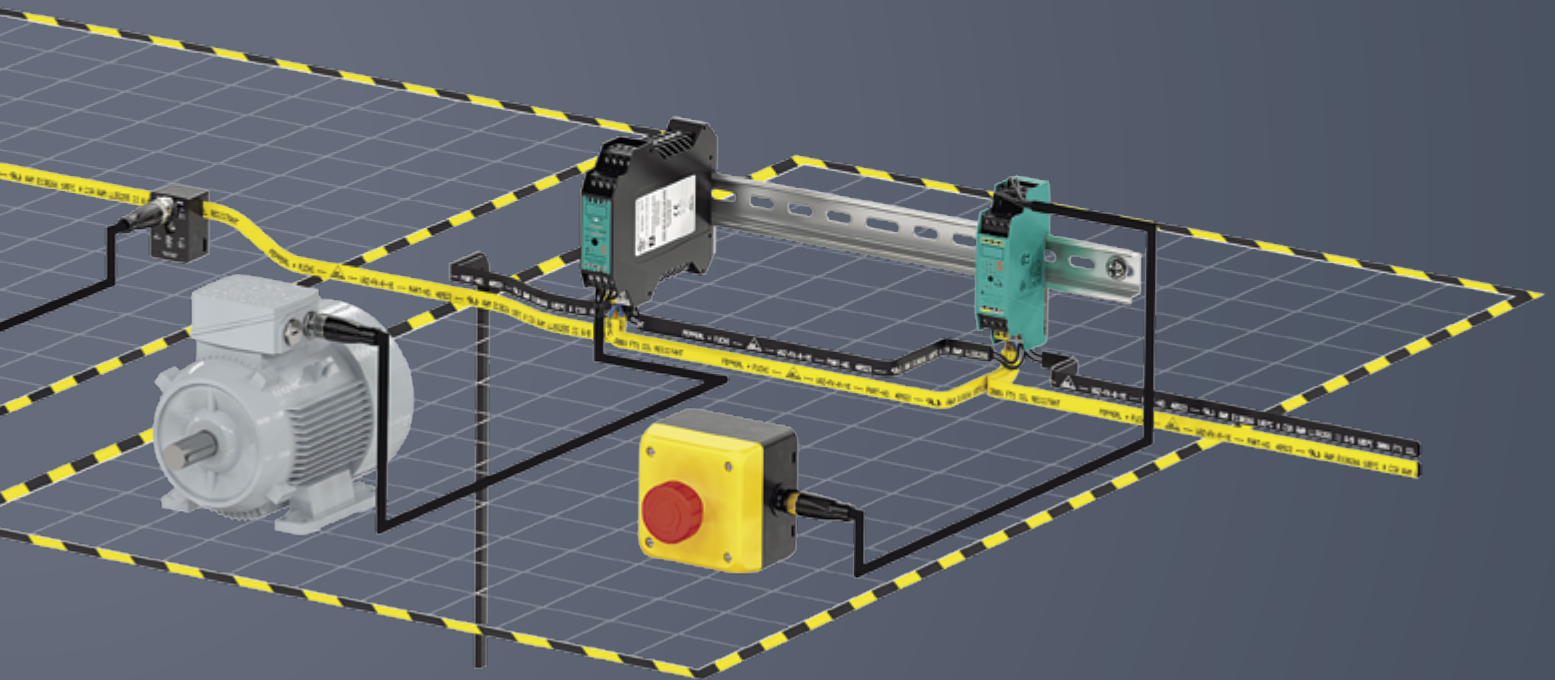


Pepperl-Fuchs offers a variety of safety input and output modules available in field and enclosure mounted versions. These modules are specifically designed and constructed to satisfy rules and regulations necessary to obtain desired safety ratings. This construction includes redundancy at the inputs and internal components.



G12 safety modules connect dry-contact inputs for connection to standard E-stops and gate switches.





KE1 safe input modules connect safe contacts in the control cabinet or junction box via removable, color-coded terminals.



KE3 safe output modules connect redundant relay outputs in the control cabinet. Multiple remote safe output modules can be associated with the same safe data channel if required.



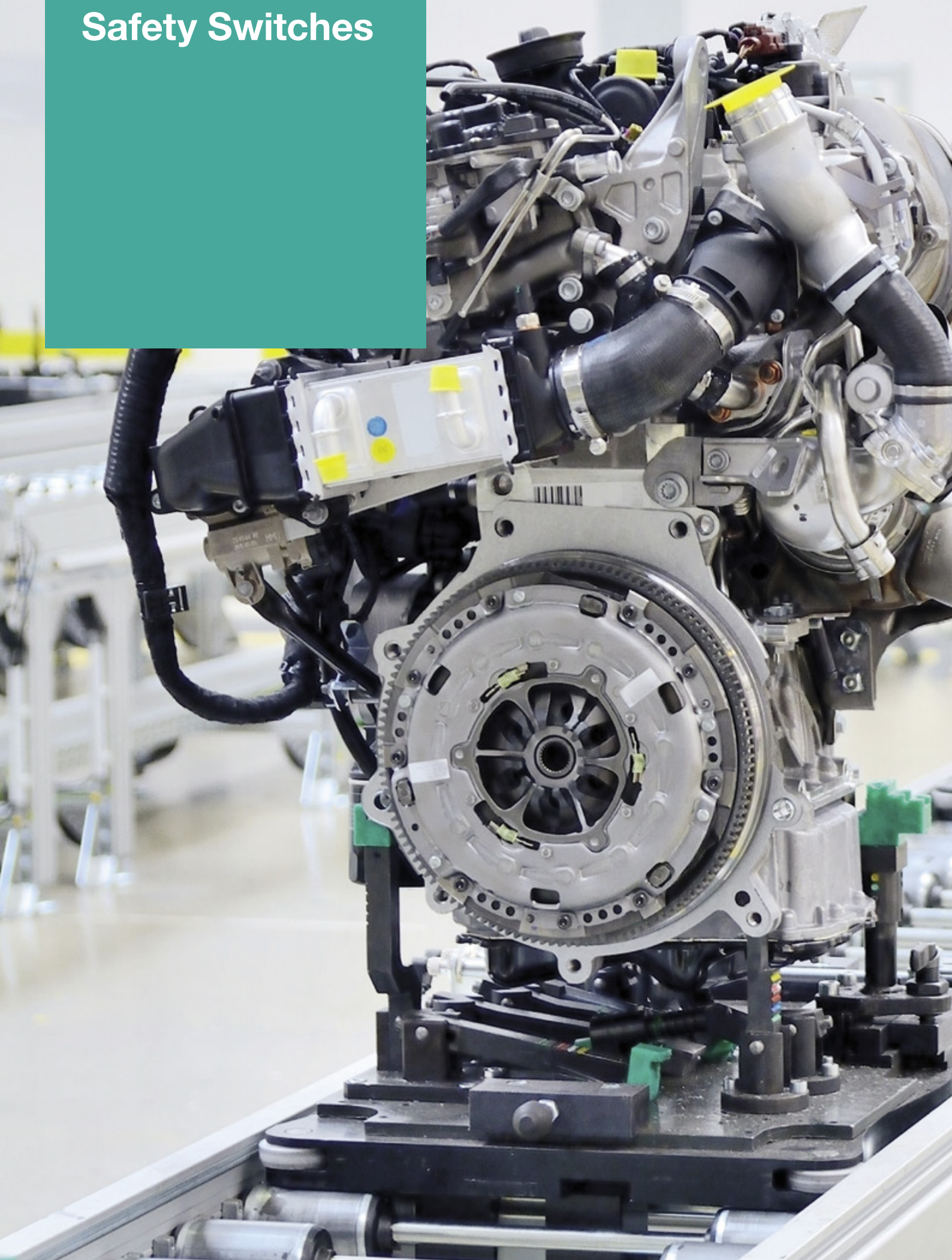
KE4 rotational speed monitor monitors the standstill, rotational speed and direction of rotation on a maximum of two axes.

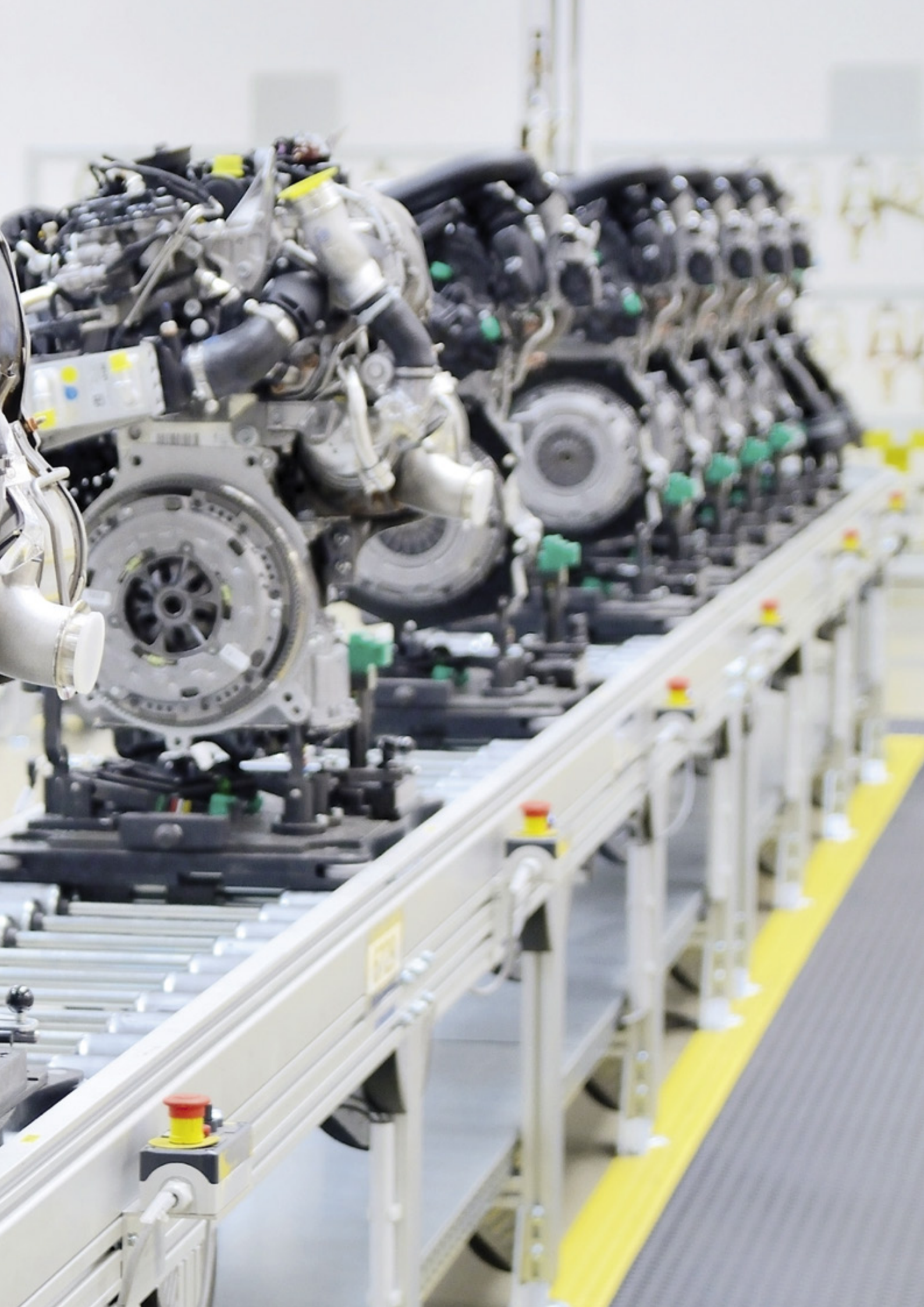
How to use the shortlinks  
see page 2.



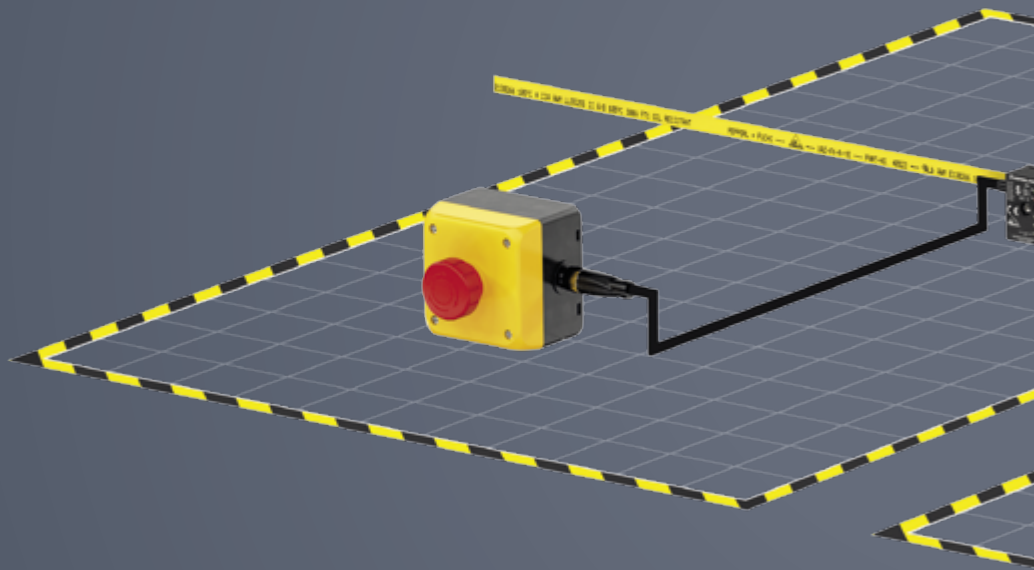
#SafetyIO

# Safety Switches





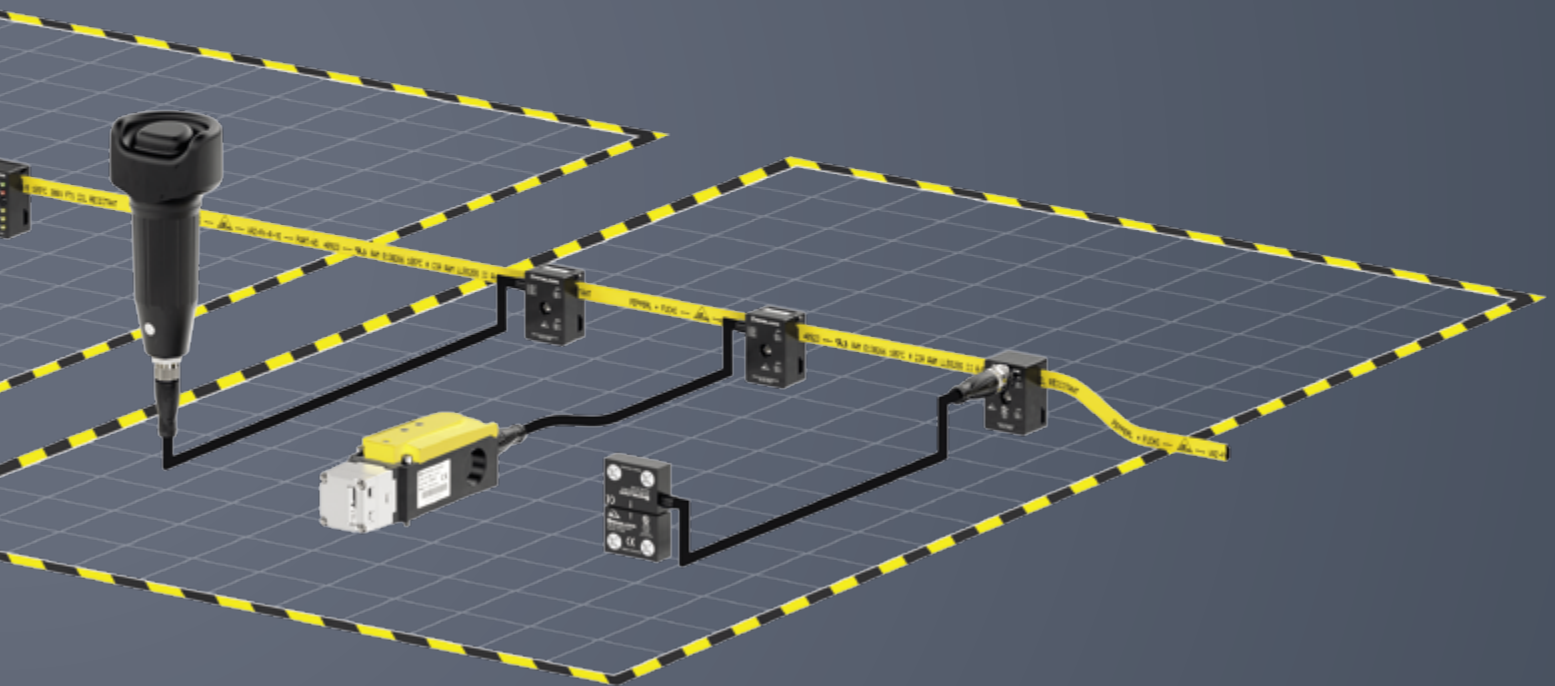
# Safety Switches



Pepperl-Fuchs offers a variety of safety switches, enabling switches and E-stops which connect directly to the AS-Interface network providing seamless integration into standard PLCs and higher level networks.



Emergency stops can be easily connected to the AS-Interface cable with a G10 Safety input module. The AS-Interface safety module is integrated into the e-stop itself. Four versions are available: illuminated panel mount, non-illuminated panel mount, illuminated field mount, and non-illuminated field mount.



Safe enabling switches allow operators to enter a potentially harmful area without shutting the machine down. If the operator senses an unsafe condition they can fully push or release the enabling switch, shutting down the machine.



Safe magnetic door switches are designed for use on moveable machine guarding components. Coded magnets are needed to bypass the safety operation. With their rugged, noncontact design, these switches withstand typical mechanical abuse and vibration.



Safety door interlock switches prevent machine operation in the event of a potential hazard. Switches are available with LEDs (optional) and power to lock or unlock options. Every safety switch has two internal contacts that are safely opened when the key is removed – with or without solenoid locking function interruptions.

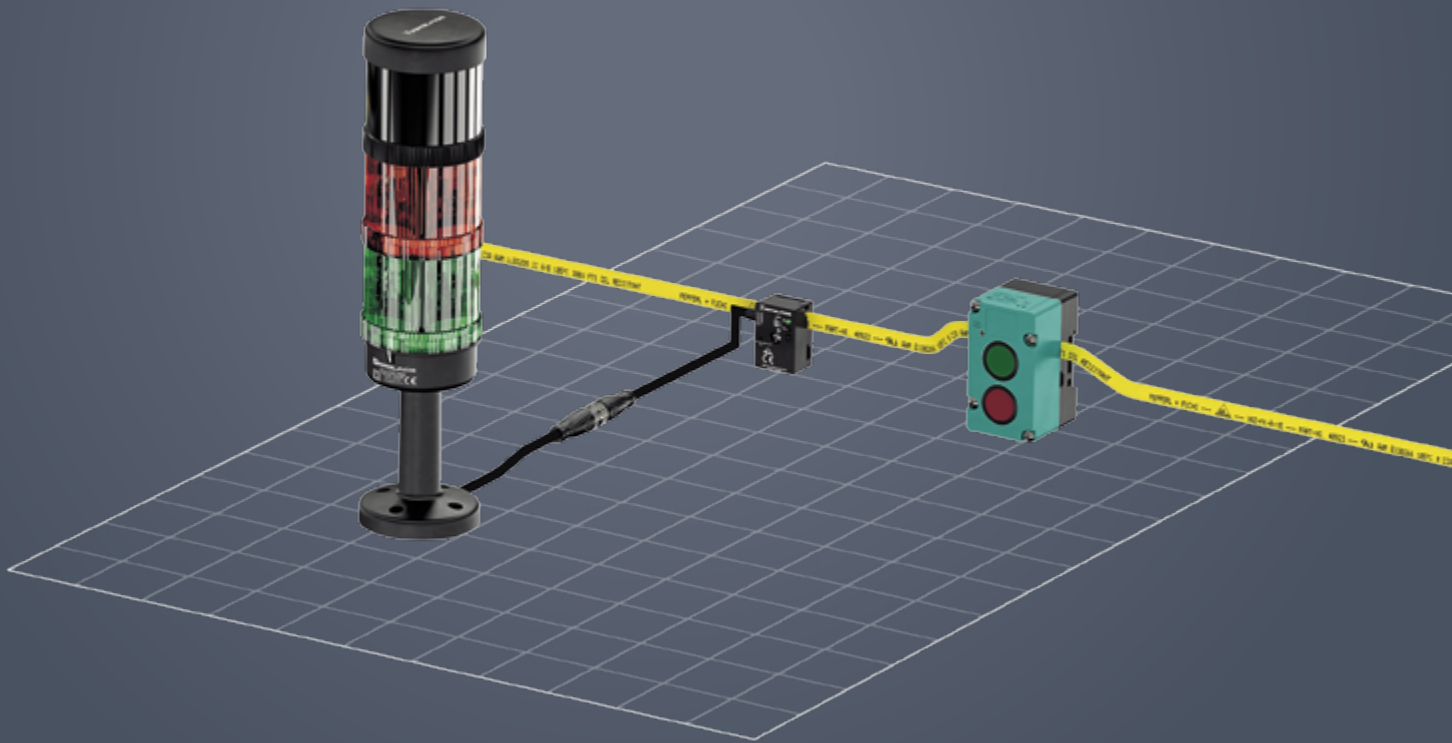
How to use the shortlinks  
see page 2.



#Switches

# AS-Interface Accessories

Pepperl+Fuchs offers all the accessories you'll need to put your AS-Interface network together – from spools of flat cable to splitters, adapters, handheld programmers, and more.



Stack lights are available to indicate the system status, state of safety components, and warn operators when a problem occurs. With AS-Interface, the stack light is no longer required to be wired back to the enclosure-mounted PLC.



Pushbutton modules and stack lights are frequently used on AS-Interface networks. Operating buttons with a flat cable connection and integrated indicator lights are provided for manual operation. System components can be easily controlled using the START/STOP buttons providing the operator visual feedback on their system.



#Indicators



Although a standard two-wire round cable can be used, the preferred way to install AS-Interface is via the famous yellow flat cable. It provides an efficient installation method and, due to the mechanical keying, guarantees correct polarity. Also, the yellow cable ensures that the network operates at peak electrical performance, regardless of the network length (up to 100 meters per segment) and network topology.



A variety of M8 and M12 connectors are available bringing easy connectivity options to AS-Interface networks.



Repeaters enable segments to be strung together, extending the length of an AS-Interface network. Up to two repeaters can be connected in series to achieve a maximum network expansion of 1000 m in combination with the terminators.



A handheld programmer is the easiest way to assign addresses to AS-Interface modules on the network. It can also be used as a diagnostic tool to read the module profile, set parameters, read inputs, and set outputs.



A variety of G10 AS-Interface splitters are available for flat cable branching and connecting modules to AS-Interface networks.



Terminators enable segments to be increased from 100 m to a maximum of 200 m. The terminator reduces reflections at the cable ends and improves communication. With the integrated multiple impedance and two options for inserting the flat cable, a network length of 200 m can be achieved with all tested topologies and cable loads.

How to use the shortlinks  
see page 2.



#Accessories

# Your automation, our passion.

## Explosion Protection

- Intrinsic Safety Barriers
- Signal Conditioners
- FieldConnex® Fieldbus
- Remote I/O Systems
- Electrical Ex Equipment
- Purge and Pressurization
- Industrial HMI
- Mobile Computing and Communications
- HART Interface Solutions
- Surge Protection
- Wireless Solutions
- Level Measurement

## Industrial Sensors

- Proximity Sensors
- Photoelectric Sensors
- Industrial Vision
- Ultrasonic Sensors
- Rotary Encoders
- Positioning Systems
- Inclination and Acceleration Sensors
- Fieldbus Modules
- AS-Interface
- Identification Systems
- Displays and Signal Processing
- Connectivity