# SOLUTIONS FOR

packaging systems

SSP

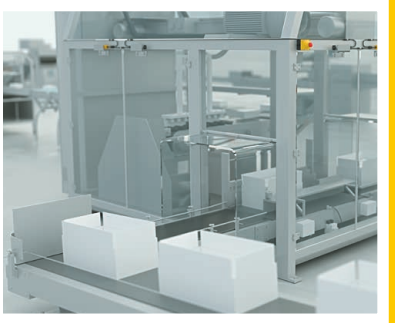
Safety System Products

# Innovative solutions for your packaging and manufacturing processes: Focus on safety and efficiency

The packaging and manufacturing industry is facing exciting challenges: strict safety regulations, integration of the latest technologies and the balance between efficiency and safety.

Our catalogue not only shows you our innovative products, but also offers customized solutions and valuable insights. Discover how we can help you optimize machine safety and improve your production processes.

Be inspired and benefit from our expertise!



## Compliance with safety standards and regulations

Legal requirements and industry standards such as ISO, the new Machinery Directive and EU regulations are becoming increasingly stringent. Users must ensure that their machines comply with the latest safety requirements.

» Regular checks and updates of safety measures, as well as investments in the latest safety technologies.

## Integration of security technologies

Integrating new security components into existing systems can be complex and costly.

» Utilization of modular security systems and collaboration with experts to ensure seamless integration.

## Minimizing downtimes

Safety precautions can lead to production disruption, if machines have to be stopped regularly.

» Implementation of proactive maintenance programmes and advanced sensors that allow preventative measures to be taken without interrupting operations.

## Cost management

Security measures can require high investments, which makes cost management difficult.

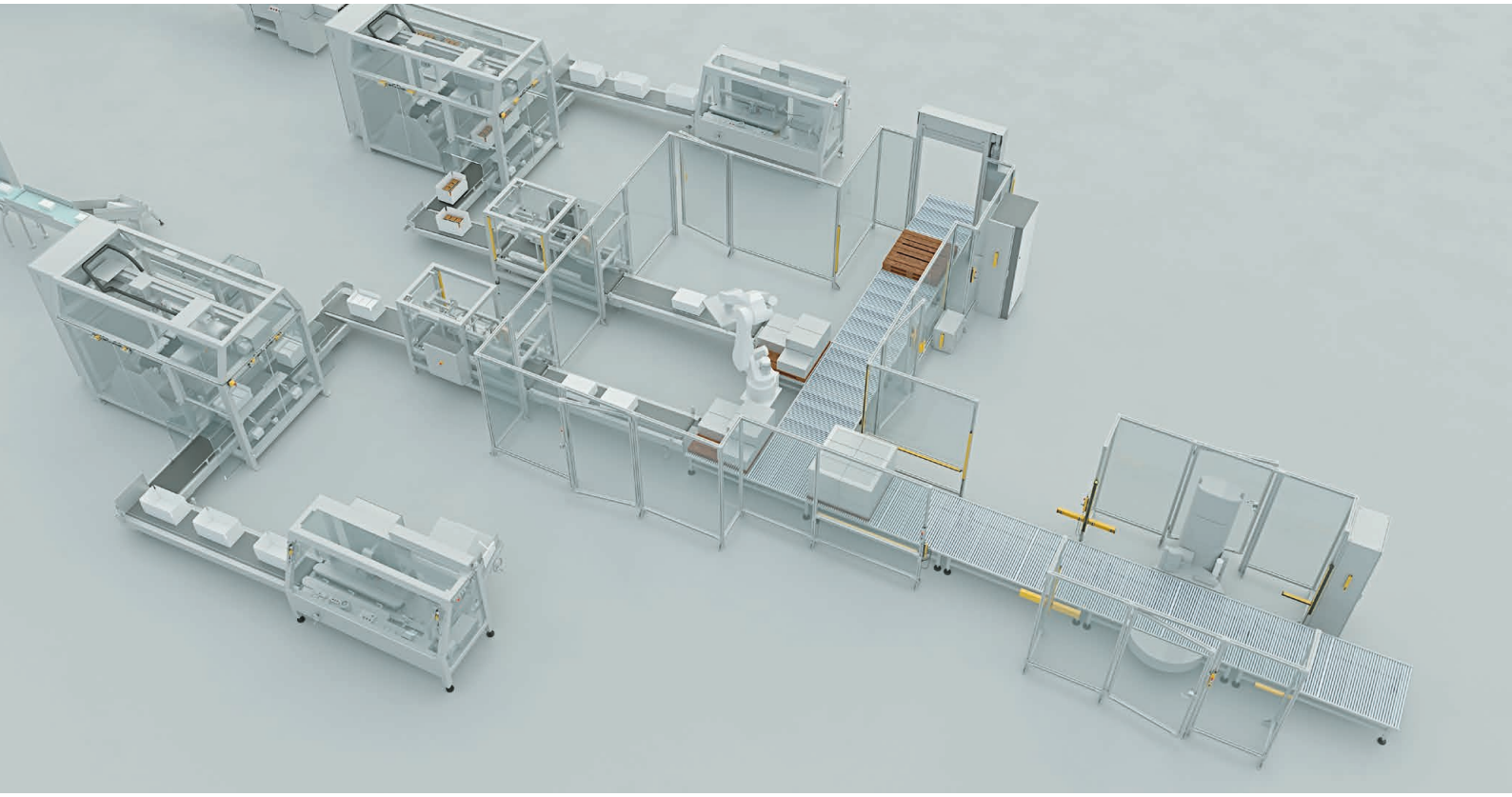
» Cost-benefit analyses and long-term planning to strategically implement security investments.

## Rapid technological changes

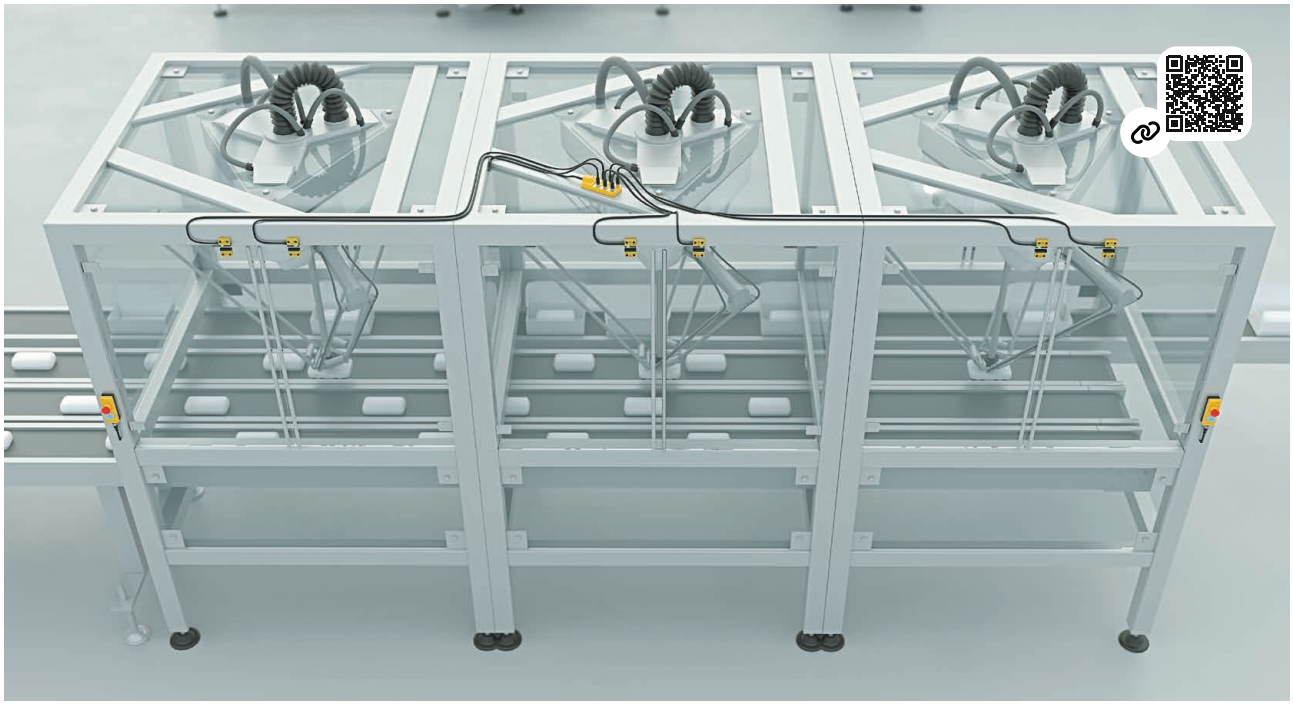
The rapid advancement of new technologies requires continuous adaptation and investment.

» Flexibility and willingness to invest in advanced technologies, as well as partnerships with innovative partners.

# Index



# RFID safety sensors



Example of safeguarding a packaging system with SAFIX 3 RFID sensors

### Intelligent and secure door monitoring

Contactless RFID sensors are used to monitor doors that can be opened at any time. However, the prerequisite for this is that the system comes to a standstill quickly, or rather that the required safety distance can be maintained. A short response time and a flexible wiring concept are therefore among the most important requirements.

### Flat actuator — inconspicuous and flexible

A flat actuator saves space, increases safety, enables flexible mounting, is more resistant to shocks and vibrations, and offers ergonomic advantages.

Ideal for confined and demanding industrial environments, ideal for mounting inside doors.


SAFIX 3 sensors with the XCONN passive distributor

## Versatile in safety applications

- ✓ PLe according to EN ISO 13849-1:2016
- ✓ Series connection of up to 30 sensors without loss of safety from up to 30 sensors without loss of safety
- ✓ Integrated EDM function with manual or automatic reset (no safety relay required)
- ✓ Highly coded according to EN ISO 14119:2013
- ✓ High degrees of protection IP67 and IP69K for use in harsh environments, ECOLAB certification
- ✓ Connections via fixed 5 m and 10 m cable or M12 pigtail connector

Waterproof housing.
Hygenic design in the bendable zone of the cable.

Resistant against cleaning agents

ECOLAB®

IP69K

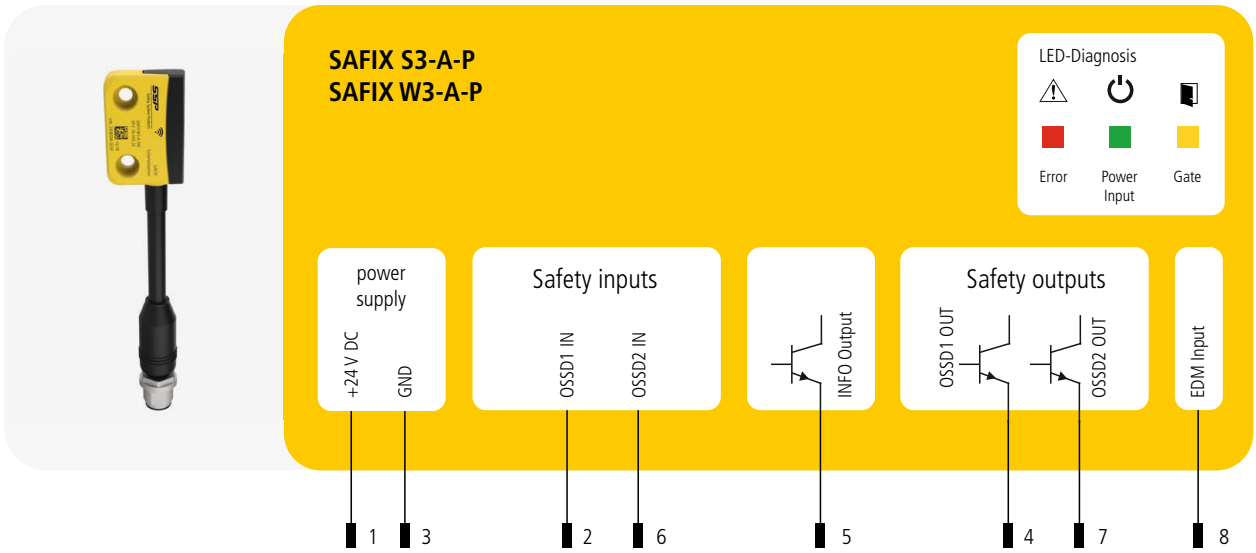
we simplify safety

# Secure networking

**Securely analyse and connect RFID sensors with the Simplifier wireless distributor.**

**Wireless-Distributor XCONN**

## Electrical connection



## EXCERPT FROM THE 14119:2013

### 5.2 Arrangement and attachment of position switches

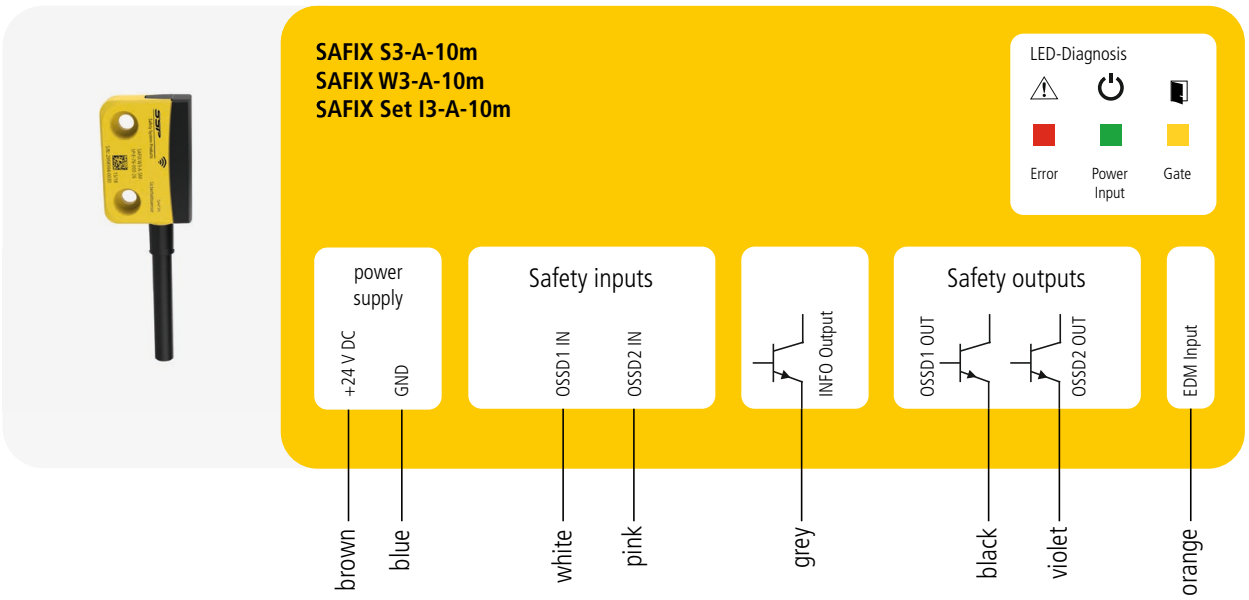
Position switches must be arranged in such a way that they are adequately secured against any change in their position. To achieve this, the following requirements must be met:

**a)** the fastening elements of the position switches must be reliable and to loosen them a tool is required.


### Risk assessment

If determined in the risk assessment, that the
safety switch must be prevented from coming loose (EN ISO 14119:2013), the screw covers supplied are one way of dispensing with safety screws. To subsequently open the screws, the cover must be opened by using a special tool.

### Electrical connection



# Diagnosis SAFIX

## Extended LED diagnostics

| Green | Red | Yellow | Note |
|---|---|---|---|
| off | off | on | Sensor not actuated, voltage applied |
| on | off | off | Sensor activated, all inputs set correctly |
| blinking | off | off | Sensor actuated, safety inputs not set (low level) |
| flashing | off | off | Safety inputs set (high level), waits for initiating impulse |
| off | off | blinking | Actuator on reception limit |
| off | off | flashing | calibration process |

| Green | Red | Yellow | Note |
|---|---|---|---|
| off | blinking 1x | off | Error safety outputs |
| off | blinking 2x | off | Error safety input |
| off | blinking 3x | off | Safety input error. EDM automatic: Safety relay error. EDM manual: Initiating impulse malfunctioning |
| off | blinking 4x | off | Error — excessive or low voltage |
| off | blinking 5x | off | Temperature outside the permissible range |
| off | blinkt 6x | off | Incorrect actuator |
| off | on | off | Continuous light<br>Internal device error |

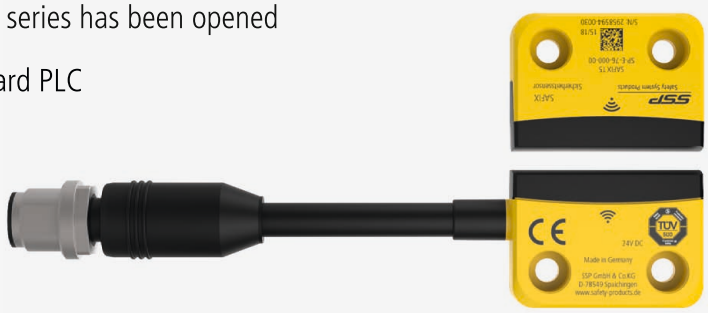
## Advantages of the extended diagnosis

✓ Reduced machine downtime thanks to LED diagnostic function

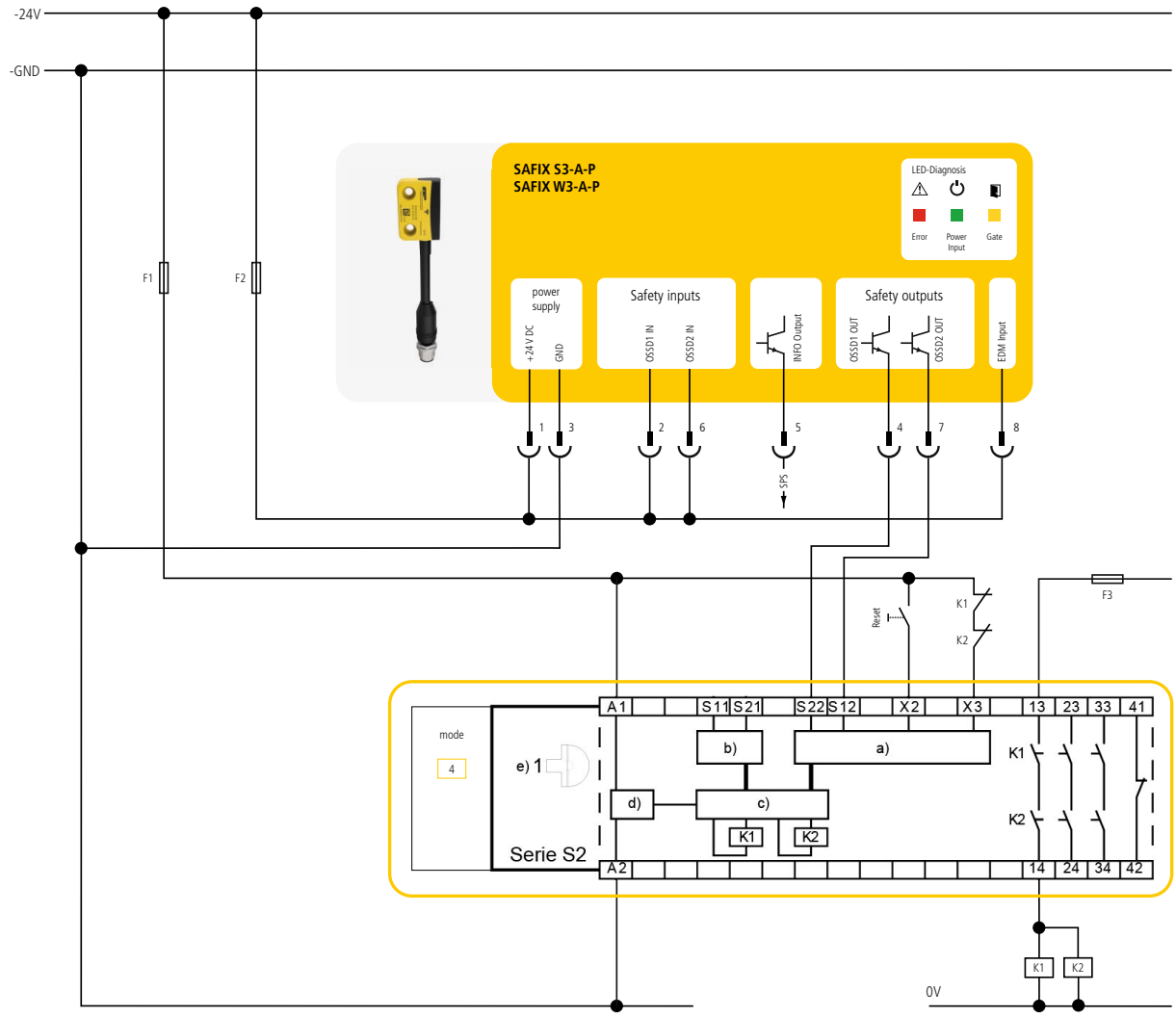
- Door open / closed
- error input/output circuit
- Series circuit diagnosis, whether a door in the series has been opened

✓ Diagnosis output for visualisation on the standard PLC

- Door open / closed

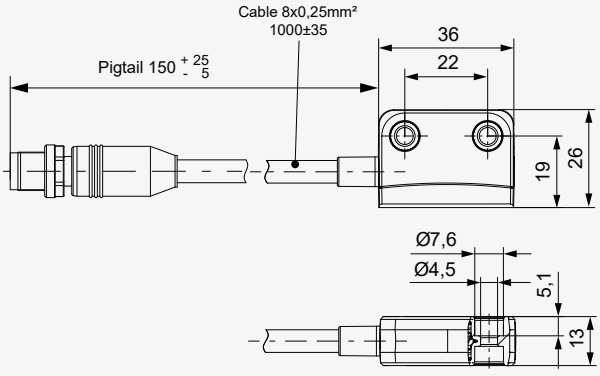


## Wiring example SAFIX 3 with the SSP safety relay series S2

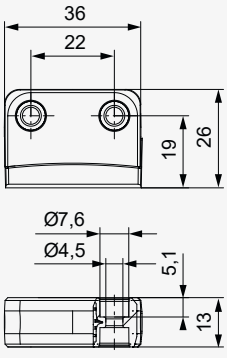



## Dimensioning

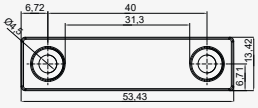
Sensor




Standard actuator T5




Flat actuator T6



# DID YOU KNOW...

… how important the quick response time of RFID sensors are, and how the response time impacts the distance to the danger zone?

The standard EN ISO 13855:2010 describes the arrangement of protective devices, regarding the proximity speed of human bodies. The minimum distance of a safety device, without guard locking to the first potentially dangerous movement, is therefore calculated as shown in the following diagram.


$$S = K \cdot T$$

**S** = Distance to the danger zone **K** = Constant = 1600 mm/s **T** = Total time until standstill

# Sample calculations of the risk time

In the following calculations, we would like to show you an example of how the risk time of RFID safety sensors can affect the distance to the danger zone (without series connection).

| **Example RFID safety sensor SAFIX 3 or process guard locking HoldX R** | **Example of commercially available RFID safety sensor or process guard locking** |
|---|---|
| Switch-off delay (toff) actuator to OSSD output: max. 75 ms | Switch-off delay (toff) actuator to OSSD output: max. 260 ms |
| **S = 1600 mm/s · 75 ms** **S = 120 mm** | **S = 1600 mm/s · 260 ms** **S = 416 mm** |
| The response time 75 ms alone, results in a safety distance of 120 mm. For a very precise calculation, you must add the response time of the evaluation unit (e.g. safety controller) and of the run-on to standstill. | The calculation shows, that by using a response time of 260 ms, a safety distance of 412 mm is already maintained. This is 292 mm more than in the previous calculation. This can be an important factor when designing a machine.. |

If safety sensors are connected in series, the risk time for switching off the inputs must also be factored in the calculation. In the following example, 24 sensors are connected in series.

| **Example RFID safety sensor SAFIX 3 or process guard locking HoldX R** | **Beispiel marktüblicher RFID-Sicherheits-sensoren oder Prozesszuhaltungen** |
|---|---|
| 1 x Switch-off delay (toff) actuator to OSSD output: max. 75 ms<br>23 x Switch-off delay (toff) Inputs max. 3 ms | 1 x Switch-off delay (toff) actuator to OSSD output: max. 260 ms<br>23 x Switch-off delay (toff) Inputs max. 20 ms |
| **T = 75 ms + 23 · 3 ms** **T = 144 ms**<br>**S = 1600 mm/s · 144 ms** **S = 230,4 mm** | **T = 260 ms + 23 · 20 ms** **T = 720 ms**<br>**S = 1600 mm/s · 720 ms** **S = 1152 mm** |
| For the correct calculation, you must also add the response time of the evaluation unit (e.g. safety controller) and of the run-on to standstill. | |

# Smart process guard lock

**Protecting processes and people**

The smart **HOLDX R process guard lock** protects packaging systems against unintentional opening. The integrated RFID safety sensor ensures the safety of the system, while the electromagnet keeps the door closed and thus protects the processes. The integrated RFID safety sensor meets the highest performance level PLe. An integrated Bluetooth interface and the extended LED diagnostics enable smart operation and fast diagnostics. Two variants, **RS with 600 N locking force** and **RL with 1200 N locking force**, are available.

- ✓ PLe according to EN ISO 13849-1:2016
- ✓ Highly coded acc. to EN ISO 14119:2013
- ✓ Response time only 75 ms
- ✓ Locking force of 600 N oder 1200 N


Process guard locking HOLDX RS1 on a sliding door, tGard operational unit for controlling the system

### Advantages of Bluetooth diagnostics

- ✓ Has a guard lock been manipulated? (e.g. by using the wrong actuator)
- ✓ How often has a new actuator been trained?
- ✓ How often was a door pulled open even though it was locked?
- ✓ Storage of valuable information such as:
  - Short-circuit or loose contact
  - Incorrect actuator
  - Voltage fluctuation
  - $B_{10D}$-value of downstream actuators

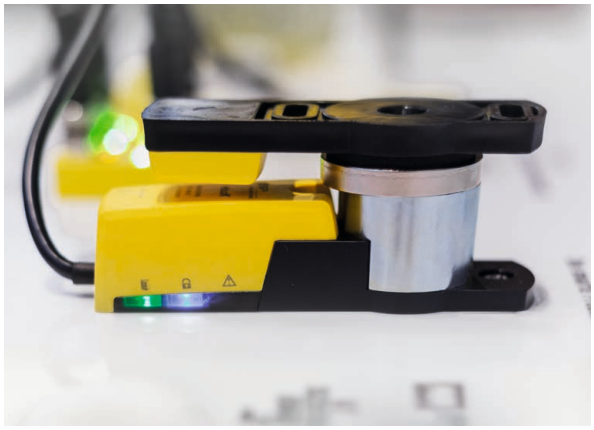
### Advantages in the application

- ✓ Series connection of up to 30 guard locking devices HOLDX R1 without loss of safety
- ✓ Wear-free process guard locking
- ✓ Diagnostics via the integrated Bluetooth interface
- ✓ One diagnostic output provides up to 20 reports
- ✓ Functional modules for evaluation of the diagnostics are available for Siemens, Beckhoff and Rockwell
- ✓ Two designs for different installation situations

# HOLDX R

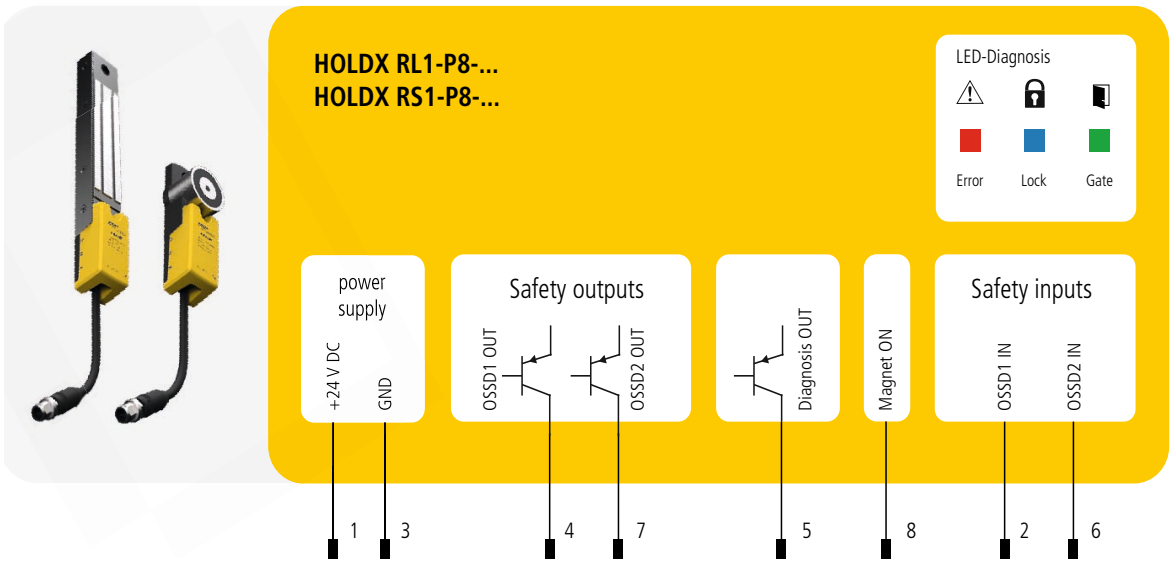
## Extended LED diagnostics

| Green | Safe sensor function |
|---|---|
| on | OSSD input circuit available,<br>Door closed |
| blinking 1x | Door open |
| blinking 2x | OSSD input circuit not available,<br>Door closed |
| blinking 4x | OSSD input circuit not available,<br>Door open |



The smart HOLDX R guard lock enables quick and easy diagnostics thanks to LEDs on both sides. It immediately recognizes if another process guard locking device in the system does not achieve the desired locking force or if there is a fault in the input or output circuit of the guard locking. This means that the system or guard locking can be cleaned or realigned as part of preventive maintenance.

### Electrical connection



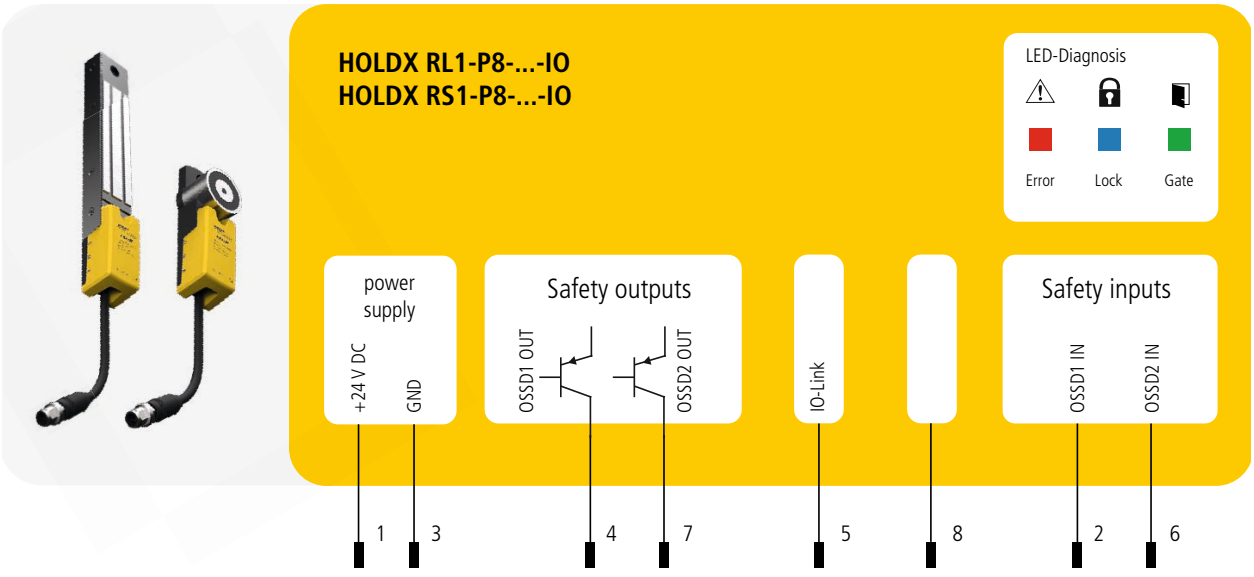
## Extended LED diagnostics

| Green | Red | Blue | System status |
|---|---|---|---|
| on | on | on | Device startup |
| blinking 2x | blinking 2x | blinking 2x | RFID teach-in process |
| blinking 3x | blinking 3x | blinking 3x | Device pinged |
| blinking 5x | - | blinking 5x | Calibration of the magnet required |

| Blue | Lock Funktion |
|---|---|
| off | Magnet not activated |
| on | Door closed, Locking force applied |
| blinking 1x | Door closed, Locking force undercut |
| blinking 2x | Door open, Magnet activated |
| flashing | Magnet is being calibrated (fast blinking) |

| Red | Error diagnosis |
|---|---|
| off | No error found |
| on | Internal device error |
| blinking 1x | Safety output error |
| blinking 2x | Safety input error |
| blinking 3x | Overvoltage or undervoltage |
| blinking 4x | Error Door torn open |
| blinking 5x | Temperature outside the permissible range |
| blinking 6x | Incorrect RFID actuator |
| blinking 7x | Magnetic flux measurement error |
| blinking 8x | Set $B10_D$ values in the limit range |
| blinking 9x | RFID sync error |

# NEW | now also with IO-Link



# Networkable variant

Packaging machine with six guard locks HOLDX R2, intelligently connected in series

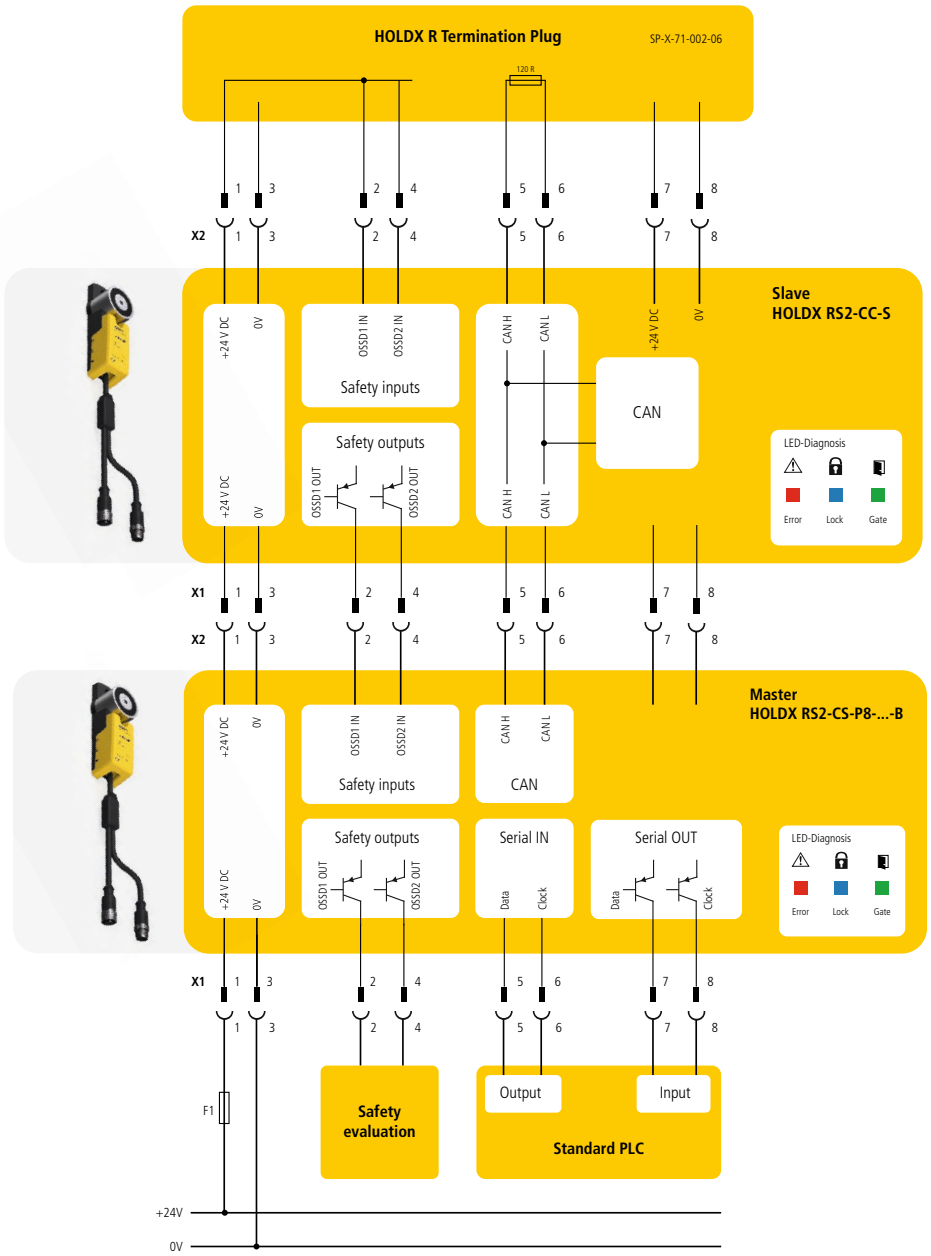
## Smart series connection with several doors

Packaging machines typically have many doors to ensure easy access to the machine during set-up or for maintenance purposes. More than ten doors in a safety circuit are not uncommon. The smart guard lock HOLDX R2 was developed for precisely these applications. Thanks to an intelligent and simple wiring concept, up to 30 HOLDX R2 can be easily connected in series without having to forego diagnostic options. This means that each participant can be analysed individually without the need for an additional gateway. It is also possible to analyse the information from the HoldX R2 on any commercially available controller. SSP offers ready-made function blocks for controllers from Siemens, Beckhoff, Rockwell and B&R. Thus, the HOLDX R2 provides more than 300 pieces of information for diagnosis on the control unit.

## Extensive diagnosis

- ✓ Door opened/closed
- ✓ Door locked
- ✓ Dirty or poorly adjusted
- ✓ Manipulation of RFID sensors has taken place (vlaues are stored)
- ✓ Short circuit in input or output circuit
- ✓ Individual information signals available for each HOLDX R2

Simple series connection HOLDX RS2 thanks to Y-pigtail cable



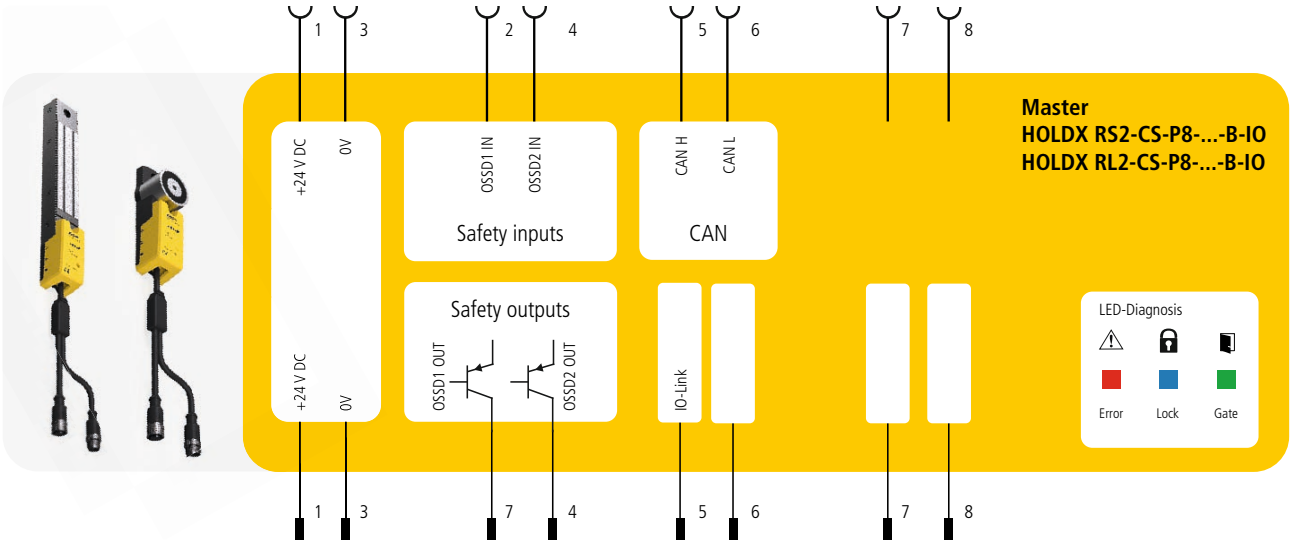
# HOLDX with IO-Link

## Advantages of IO-Link in machine safety

- ✓ Reliable data transmission and interference-free communication
- ✓ Cost reduction through simplified cabling and standardised interfaces
- ✓ Future-proof expandability thanks to modular adaptation to new requirements

## Advantages of the HOLDX with IO-Link

- ✓ **Intelligent communication:** Bidirectional IO-Link interface enables real-time diagnostics and fast reactions to faults. Process and error states are signalled directly to the control system
- ✓ **Increased system availability:** Early error detection minimises downtimes and reduces cost of maintenance through targeted error diagnosis and predictive maintenance
- ✓ **Easy installation and configuration:** Standardised IO-Link technology makes for easy installation and saves time and resources during commissioning
- ✓ **Flexible control system:** Individual control of up to 30 networked process guard locks. Doors can be individually unlocked or locked in an aimed manner



# DID YOU KNOW...

**... what is the difference between a process guard locking and a safety guard locking?**

DIN EN ISO 14119:2014 describes the function of an interlocking guard with guard locking. Its purpose is to hold a guard in the closed position to ensure that:

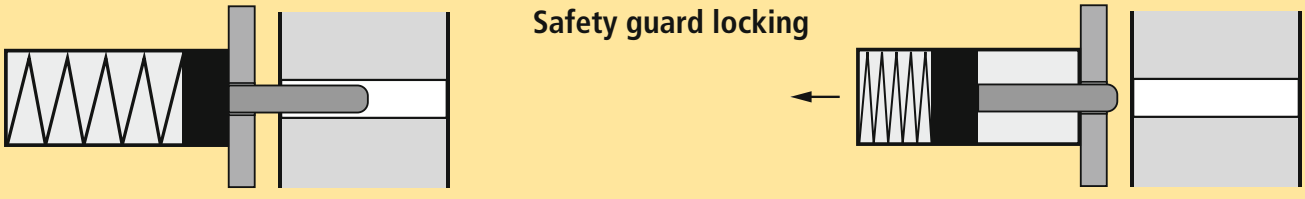
- the machine cannot be in use when the guard is not closed and locked;
- the guard remains closed until there is no longer a risk of injury.

Due to these requirements, it is important to differentiate between a process guard locking and a safety guard locking. While a **process guard locking** is opened without voltage according to the **open-circuit current principle**. A s**afety guard locking**, however, functions according to the **closed-circuit current principle** and is therefore closed without voltage, as the actuator is held in place by spring force. In contrast, an electromagnet is used for a process guard locking device. This holds the door or a similar access point closed using magnetic force.

Wird der Magnet nicht mehr bestromt, kann die Prozesszuhaltung folglich umgehend öffnen. Verliert die Anlage also z. B. wegen eines Stromausfalls, die Spannung könnte die Tür sofort geöffnet werden, während Bewegungen im Inneren der Anlage noch austrudeln. Aus diesem Grund müssen bei dem Einsatz von Prozesszuhaltungen stets die Nachlaufzeit und somit die Berechnung des Sicherheitsabstands zur Gefahrenstelle (vgl. Seite 6/7) Berücksichtigung finden. Stark vereinfacht lässt sich sagen, dass bei Anlagen mit langer Nachlaufzeit Sicherheitszuhaltungen eingesetzt werden und bei kurzer Nachlaufzeit Prozesszuhaltungen zum Einsatz kommen. Konkret wird in der C-Norm für Verpackungsmaschinen, der DIN EN 415-5:2010-04 in Abschnitt 5.2.2.1.7 die Anhaltezeit genauer definiert. Kommt die Anlage innerhalb einer Sekunde nach dem Öffnen der trennenden Schutzeinrichtung zum Stillstand, so kann meistens eine Prozesszuhaltung verwendet werden.

**open-circuit current principle**

**Safety guard locking**

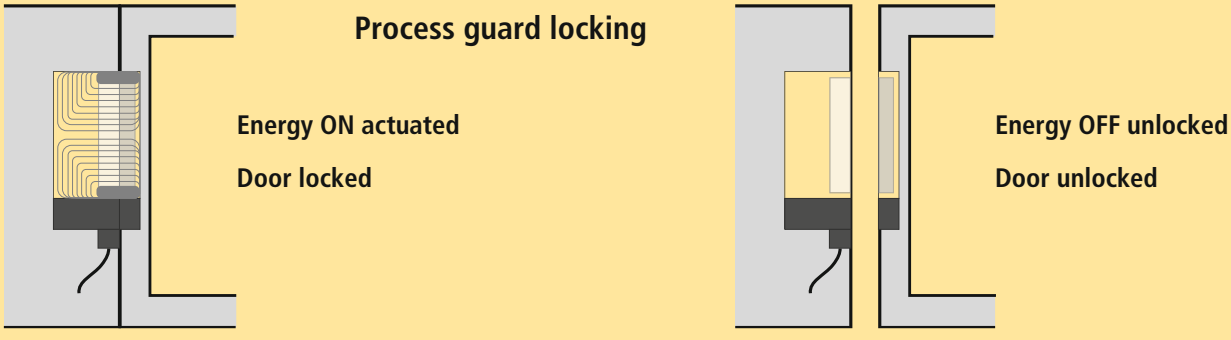


**Spring force actuated - Door locked**

**Energy ON unlocked - Door unlocked**

**closed-circuit current principle**

**Process guard locking**



# Hygiene solutions

## Washable hygienic guard locking in stainless-steel housing

Thanks to its stainless-steel housing and IP69 certification, the guard locking LOUIS is ideally suited for the food and pharmaceutical industries. The safety guard lock is easy to clean thanks to its design and corrosion-resistant stainless-steel housing. The stainless-steel surface also makes bacterial growth more difficult. Integrated seals protect the electrical system and seal any edges so that no dirt can accumulate.

- ✓ Stainless-steel housing for strict hygiene requirements
- ✓ Up to 8000 N locking force
- ✓ High RFID coding in accordance with EN ISO 14119
- ✓ SIL3 | cat. 4 | PLe
- ✓ IP67 and IP69
- ✓ First guard locking for 3-A Sanitary Standard

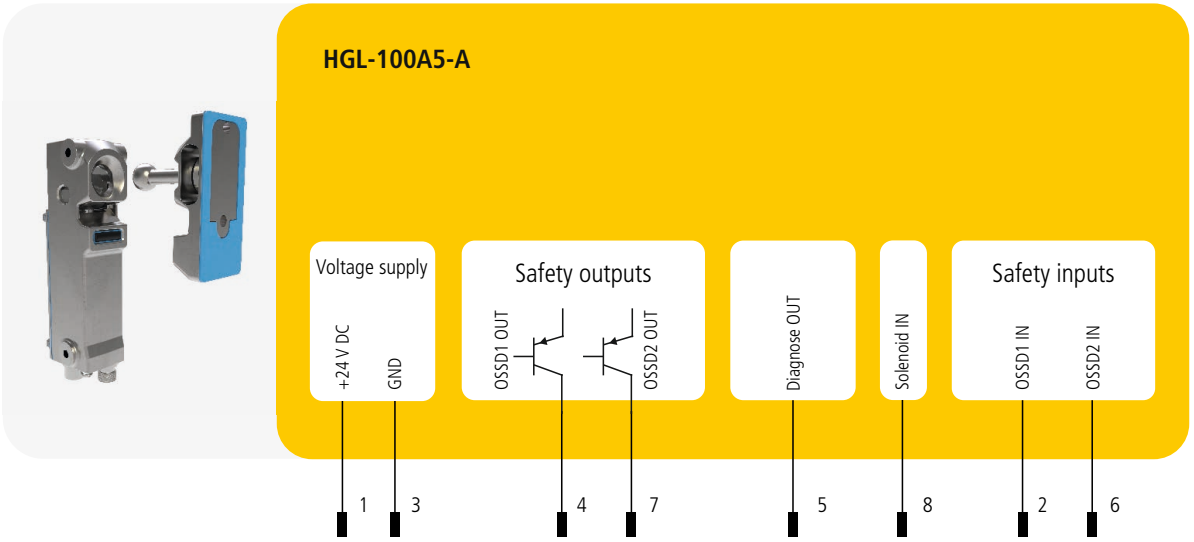

Bevelled surfaces for optimal liquid drainage

Flexible actuator

Spacers for easy cleaning and hygienic design

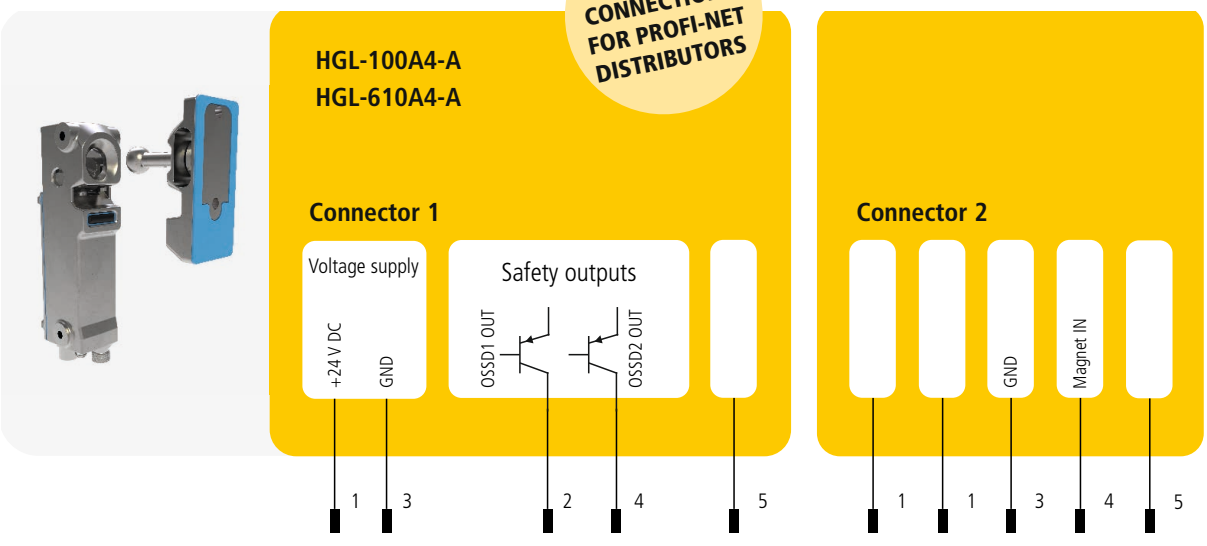
## **Standard version** | 8-pin plug


### Electrical connection




## **For field bus connection boxes** | 2 x M12 5-pin plug


### Electrical connection



# RFID safety guard locking

ATOM safety guard locking, connected to the wireless safety controller Safety Simplifier

### Safe guard locking with RFID coding

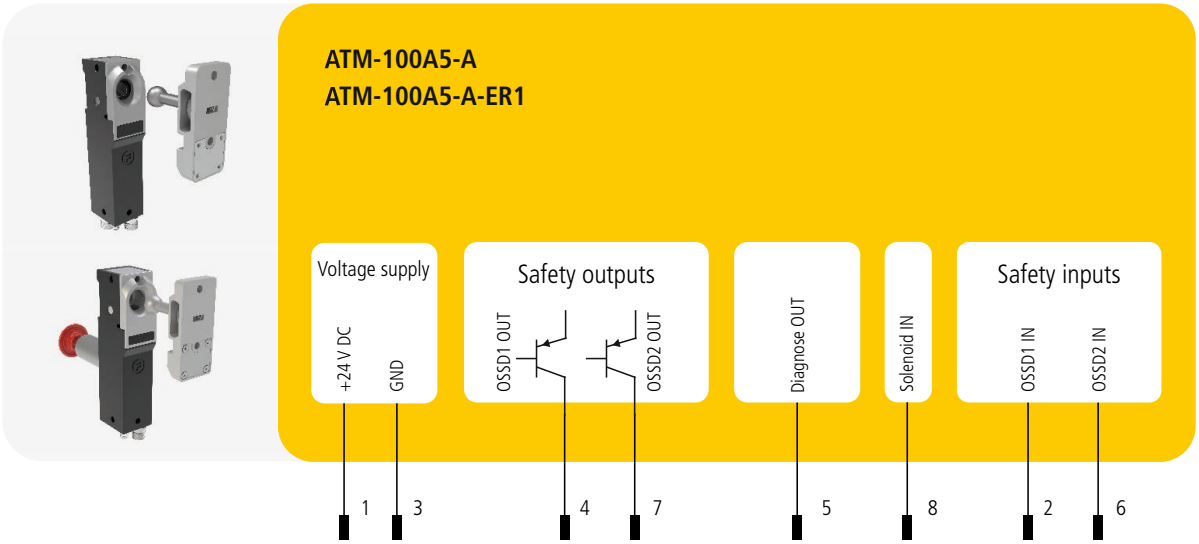
The compact and robust ATOM guard locking can be used for all applications in which doors and flaps of the system or machine need to be locked in a safety-oriented manner. With a high locking force and additional RFID coding, it can be used up to PLe. The flexible actuator enables use in tight radii and can correct misalignment, e.g. due to door misalignment. Self-monitoring OSSD outputs can be connected directly to the safety controller or to the safety relay. A variant with 2 x M12 plugs is also available for series connection.

### Advantages in the application:

- ✓ Extremely compact design
- ✓ Flexible actuator
- ✓ 7500 N locking force
- ✓ High RFID coding acc. to DIN EN ISO 14119:2014-03
- ✓ PLe acc. to DIN EN 13849-1:2016-06
- ✓ OSSD outputs
- ✓ Possible series connection
- ✓ LED diagnosis
- ✓ 14 mmoffset possible

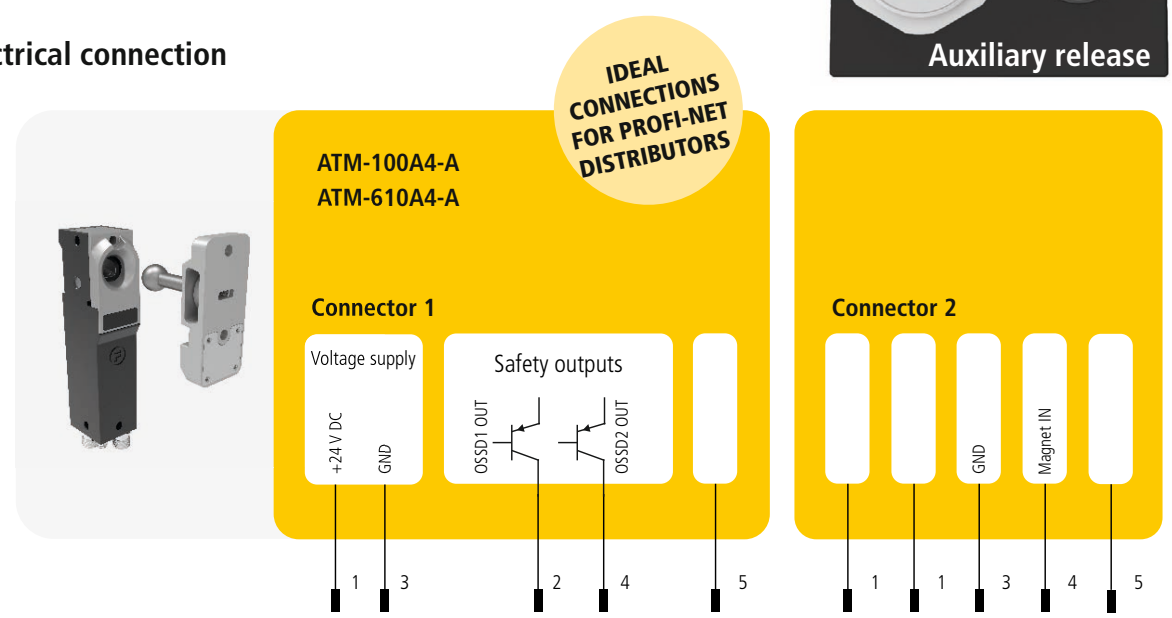
## **Standard version** | M12 8-pin plug


### Electrical connection




## **For field bus connection boxes** | 2 x M12 5-pin plug


### Electrical connection



# Safety light curtains

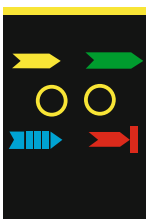
EOS4 safety light curtain for efficient protection of danger points during cyclic accesses

## Safe intervention

Light curtains are often used on packaging machines to safeguard hazardous areas that require frequent intervention. Thanks to its slim design, the EOS4 (PLe) light curtain from REER is particularly suitable for confined spaces. The fast response times of the EOS4 safety light curtains enable a compact design of the plant. The transmitter and receiver can be positioned quickly and safely using the integrated LED display. The light curtain is also configured via the pin assignment; there is no need to use programming software or DIP switches.

## Advantages in the application

- ✓ Compact design of just 28 x 30 mm
- ✓ LED diagnosis and contamination indicator
- ✓ Use in damp applications IP65 - IP67
- ✓ Optional IP69K in waterproof housing
- ✓ Temperature range from -30 °C to +50 °C
- ✓ No one-sided blind zone



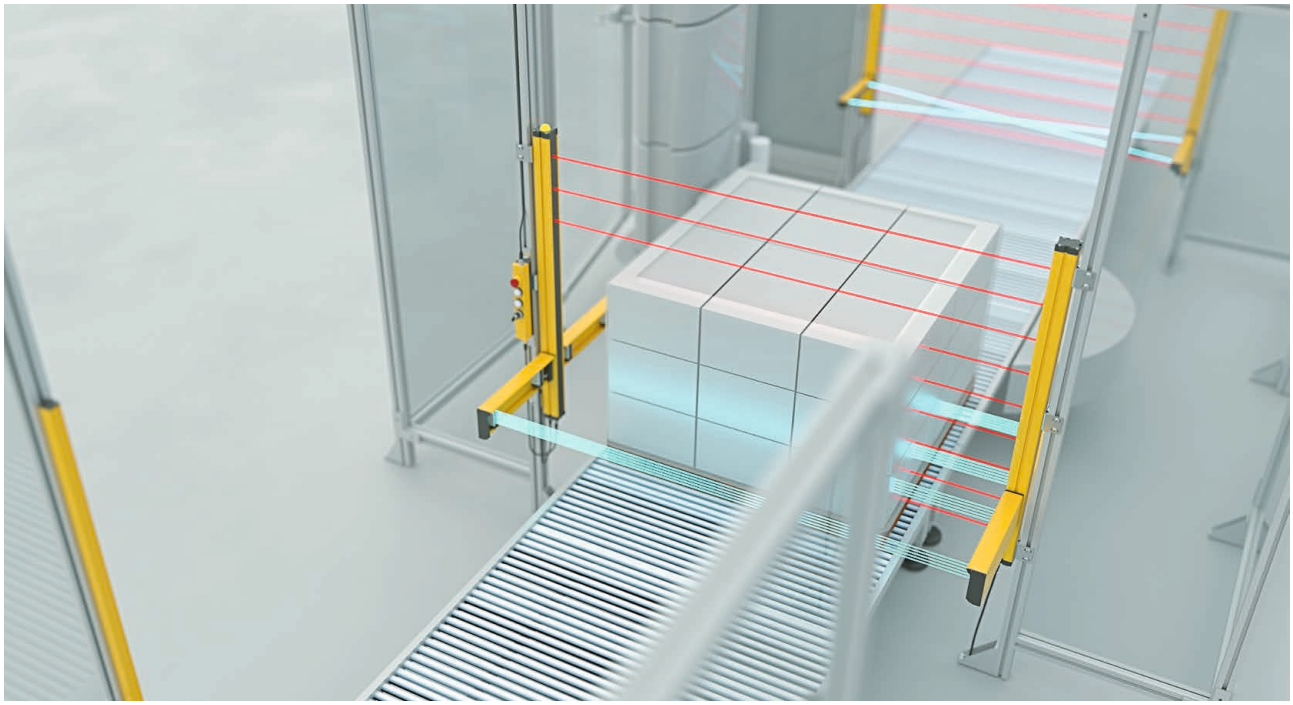
### LED diagnosis

- ✓ fault diagnosis
- ✓ Contamination indicator
- ✓ Alignment control


**Light curtains EOS4 WT in the food and pharmaceutical packaging industry**

The waterproof housing allows the light curtains or light grids to be used in harsh conditions where water and steam are present. In addition, the use of hygienic and non-toxic components means that the protective housings can also be used in the food and beverage industry, as they are ideal for packaging or filling systems.
The compact, cylindrical EOS WTF and WTHF protective housing (only 56 mm in diameter) has an IP69K degree of protection. The housing can withstand a water jet with a pressure of up to 80 bar at a temperature of 80° C.
The housing has a venting membrane that allows any moisture in the housing to escape, thus minimising the formation of condensation.
The WTHF models (with heating) have a therm-controlled heating system to enable applications in environments down to -30° C.


# Muting solutions



T-Muting with M5 multi-beam sensors for complex charges and partial muting

## Secure loading and unloading of pallets and parcels

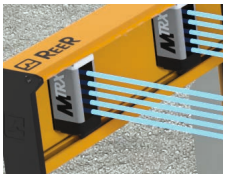
Muting plays a decisive role in conveyor and storage technology or palletising and strapping systems, to transfer goods in and out. The temporary bypass of a safety function (muting), stets high normative requirements. The SAFEGATE muting light curtain from REER significantly simplifies standard-compliant use.

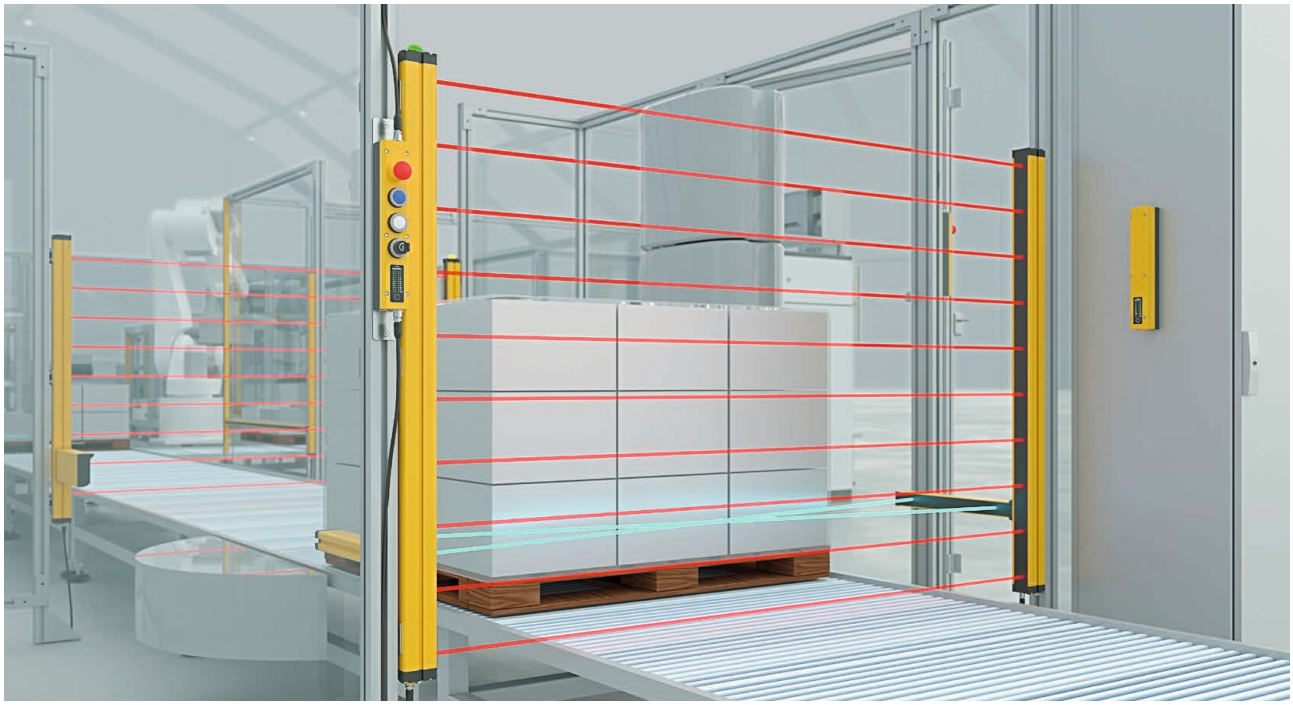
### Simplification of the normative requirements

- ✓ Muting technology integrated in the light curtain
- ✓ Fixed muting arms guarantee the normative position of the muting sensors
- ✓ Inputs for partial muting, meet normative requirements for different conveyor heights
- ✓ Additional input to start muting reduces the possibilities for manipulation

### Optimization of the application

- ✓ Fewer connections in TRX version, as transmitter and receiver are in one housing
- ✓ 5-beam muting sensors recognize different types of conveyed goods
- ✓ Muting sensors with clear glass detection for process-reliable detection of transparent objects





L-muting for unloading of pallets with crossed muting sensors

## Muting light curtain and sensors with a PFHd value

For muting applications, a performance level must be determined or calculated in the area of functional safety for muting light curtains and the corresponding muting sensors. REER provides the PFHd value for light curtains and muting sensors directly. This provides the user with a complete system, without the need for time-consuming calculation of the PFHd value. Cross and parallel muting for L and T arms are available for various applications.

## Override in case of malfunction

Wireless safety controller Safety Simplifier ensures safe evaluation of the OSSD signals. Various functions such as override enable the light curtain to be safely retracted and bypassed in the event of a malfunction.

LEDsfor status and muting indication

Connections of the muting sensors


Pre-set muting arms

# DID YOU KNOW...

**… what the safety requirements for ESPE systems to safeguard the loading and unloading of products are?**

When it comes to the safety of packaging machines, experienced designers appreciate the Type C series of standards, DIN EN 415. The ten parts of this standard describe a wide range of requirements for machines. Currently, these are:

| | |
|---|---|
| DIN EN 415-1:2014 | Terminology and classification of packaging machines and related equipment |
| DIN EN 415-3:1999+A1:2009 | Forming, filling and closing machines |
| DIN EN 415-5:2006 | Wrapping machines |
| DIN EN 415-6:2013 | Pallet wrapping machines |
| DIN EN 415-7:2006+A1:2008 | Collective packaging machines |
| DIN EN 415-8:2008 | Strapping machines |
| DIN EN 415-9:2009 | Noise measurement methods for packaging machines, packaging lines and auxiliary equipment - Accuracy classes 2 and 3 |
| DIN EN 415-10:2014 | General requirements |

The various machines are usually closed systems that are fully automated. To transport products and materials in and out of the safety area, contactless protective devices are used, especially for larger openings, which are controlled by appropriate safety functions. It must be ensured that products and materials can be transported in and out, without people entering the danger zone undetected via these openings. One way of safeguarding such openings is to bypass or blank out the ESPE system. This function is also known as muting.

**DIN EN 415-10:2014, section 5.2.1.4 sets out corresponding requirements for the function of such systems, as the following abbreviated copy shows.**

a.) The bypass period shall be limited to a length of time that allows the product to pass through the detection zone.

b.) The configuration of the bypass sensors must be able to distinguish a person from the material;

c.) All bypass functions must have the same performance level;

d.) There must be no operational waiting position for a product within the bypass area.

For further details, DIN EN 415-10:2014 refers to DIN EN IEC 62046:2019.

Section 5.5.3 requires the bypass function to be automatically initiated and terminated. This can be done by using accurately selected and arranged sensors or, in some cases, signals from the safety-related control system. No bypass condition shall be made possible by faulty signals, sequences, or timing of the bypass sensors or signals.

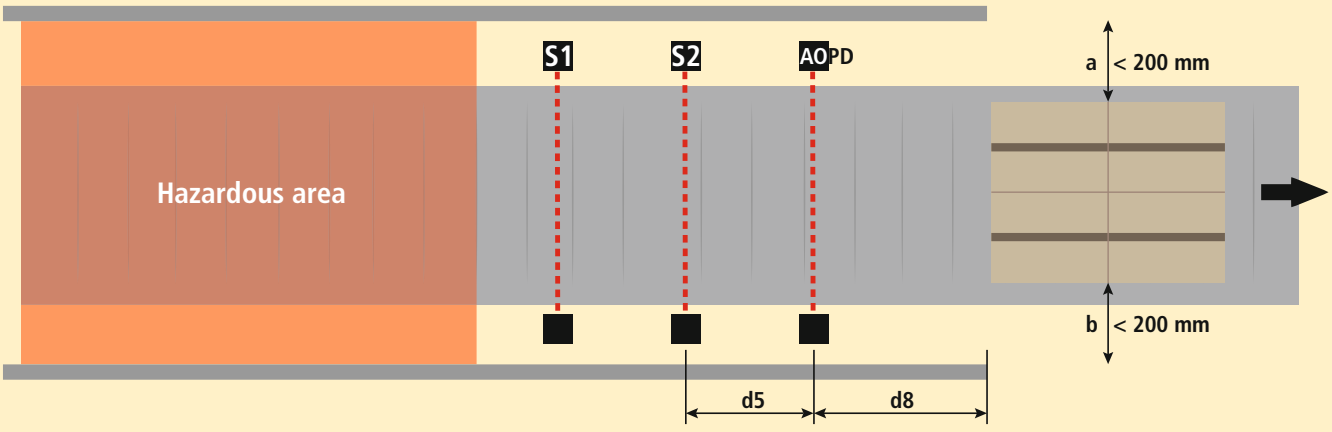
The control circuit performing the bypass function must have a suitable safety-related performance level (SIL or PL, see DIN EN 62061:2016 or DIN EN 13849-1:2016).

In addition, the safety of the machine during muting must be ensured by other means, for example by maintaining the following lateral distances and by ensuring that the load is at least 900 mm high.

If the requirements described above do not guarantee safety, other solutions may be used, such as an interlocking function.

### Systems with two beams

L-configuration with time control of the sensors (only run out of the danger zone)

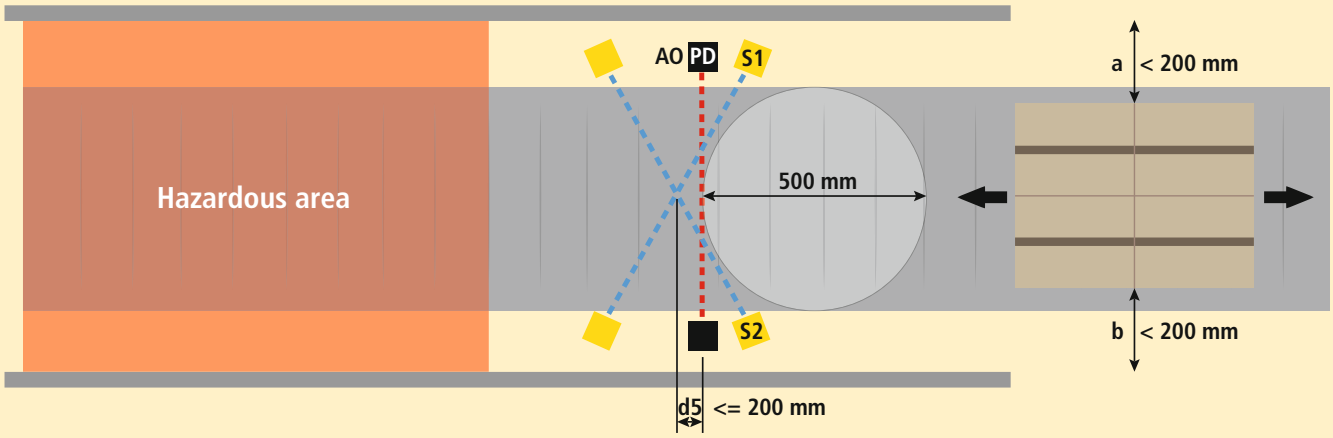



- Both sensors must be within the danger zone
- Both beams must be occupied within a certain period of time
- If the AOPD is free, or 4 seconds after leaving the first sensor, the muting must be deactivated
- If the termination only occurs after 4 seconds, an additional **distance d8** must be met.

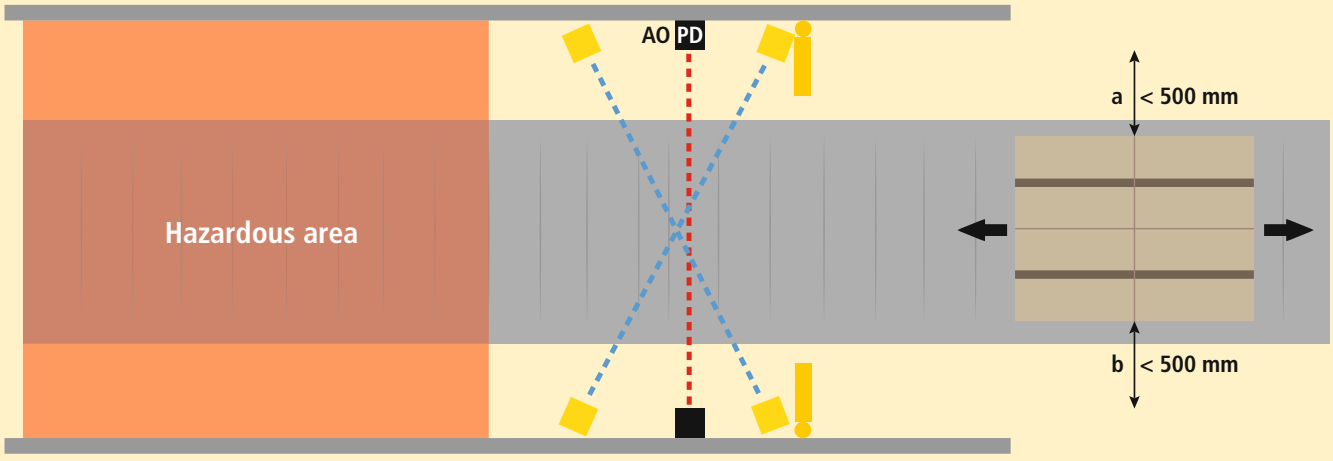
### Systems with two beams

T configuration with time control of the sensors

for inward and outward transfer from the danger area.




- The intersection point must be within the danger zone.
- The intersection point should be as close as possible to the ESPD ( ≤ 200 mm)
- The distance between the load and the guard should not exceed 200 mm
- A round test piece of 500 mm must not trigger muting.

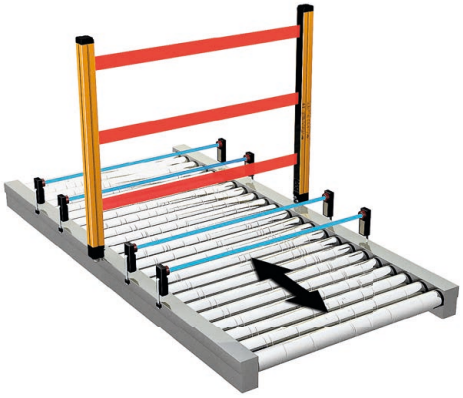


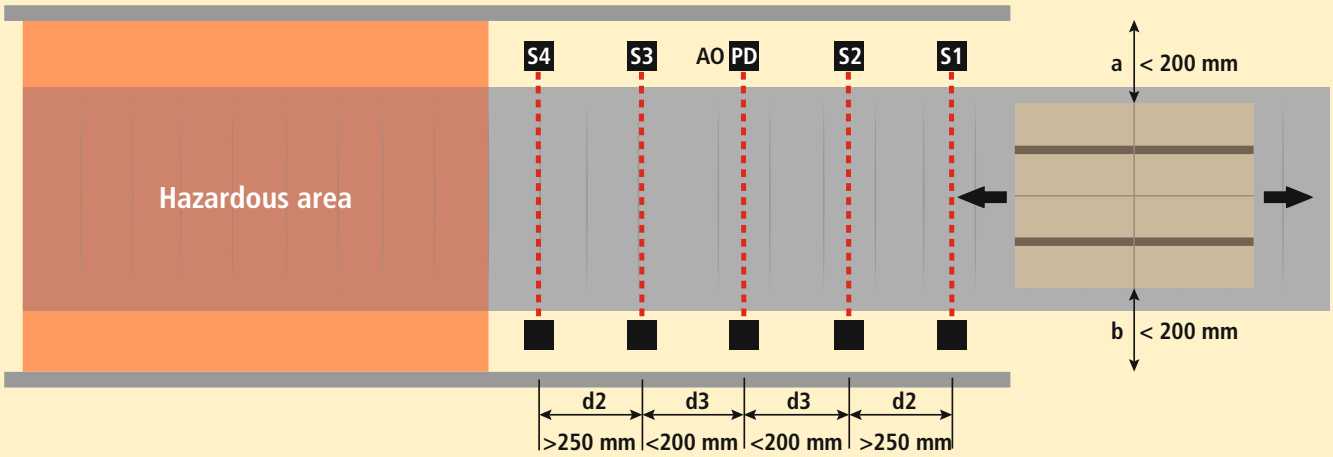

If there is a risk of body parts being crushed between the load and stationary parts, DIN EN 349:2008 recommends a minimum distance of 500 mm between the moving load and the stationary parts of the system to avoid the risk of crushing or shearing. More in-depth information is provided in EN 349.

## Systems with four beams

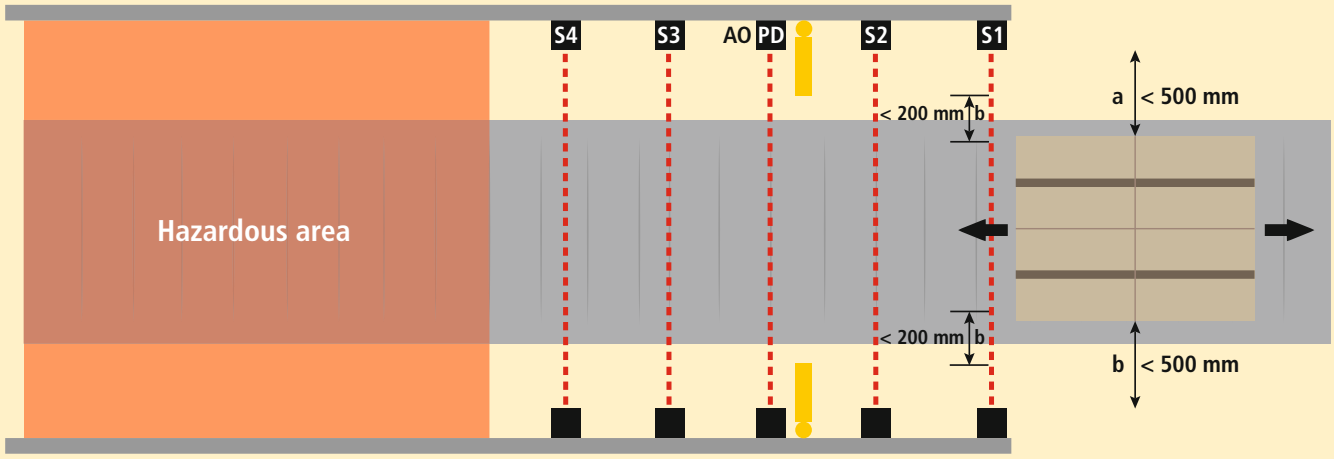
T configuration with sequential process

for inward and outward transfer from the danger area.






- The muting sensors should be as close as possible to the "ESPD" (distance < 200 mm)
- The distance between sensors S1 and S4 must be greater than 500 mm
- The distance between sensors S1 and S2 and between sensors S3 and S4 must be greater than 250 mm
- The distance between the load and the guard should not exceed 200 mm.




If there is a risk of body parts being crushed between the load and stationary parts, DIN EN 349:2008 recommends a minimum distance of 500 mm between the moving load and the stationary parts of the system to avoid the risk of crushing or shearing. Further details are given in EN 349.


## Safety technology for filling plants

Filling systems for the beverage industry must fulfil specific requirements, such as extremely high cycle rates in the narrowest of spaces, food suitability and cleaning resistance. These requirements necessitate a compact and innovative safety concept. With reliable standstill monitoring and enabling switches for set-up operation, as well as a key transfer system made of stainless-steel components, SSP offers a coordinatized product range and a high degree of experience for applications on filling plants.

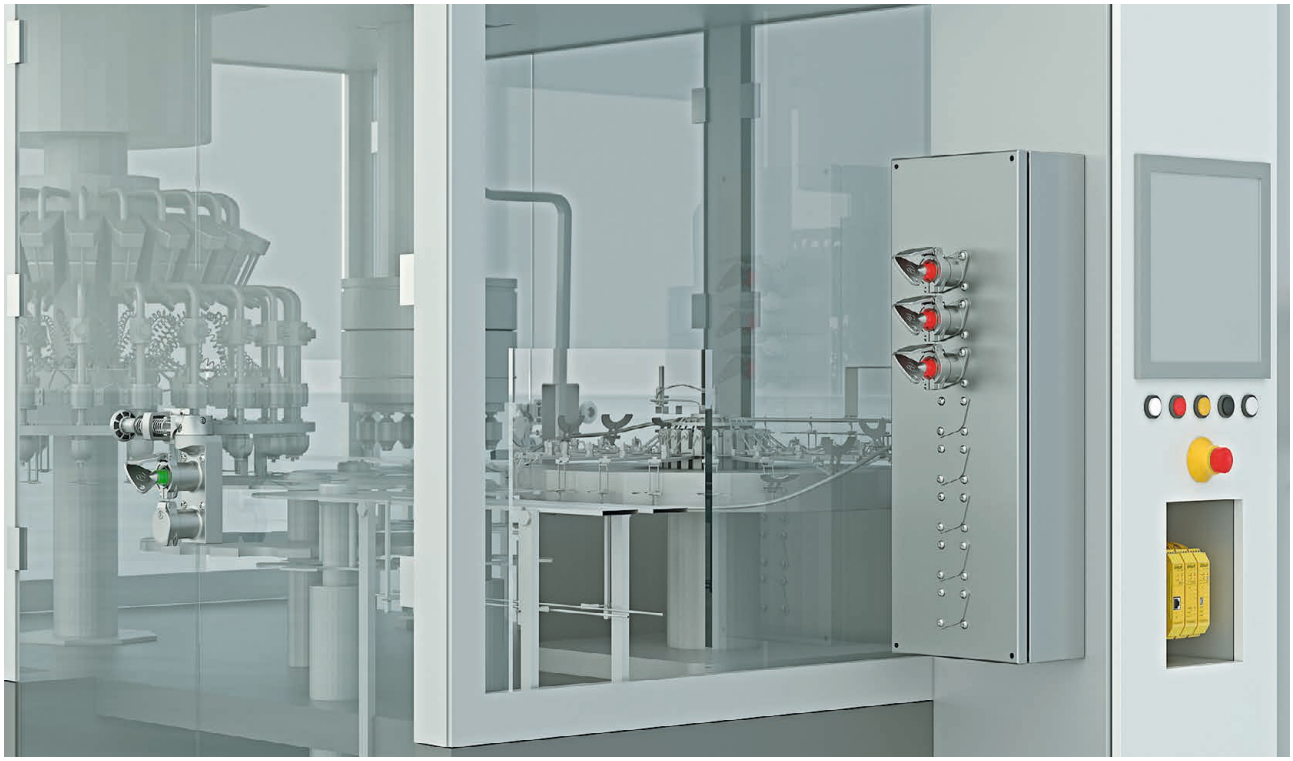
## Advantages of key transfer with mGard

- ✓ No electrics on the door
- ✓ Fast commissioning
- ✓ No cable laying
- ✓ Robust design in stainless-steel
- ✓ IP96K
- ✓ Safety key for securing accessible areas
- ✓ Modularly expandable
- ✓ PLe acc. to DIN EN 13849-1:2016

# Key transfer systems

## Key transfer system

The hygiene-compliant DMSK2 double lock is made entirely of stainless-steel and has hardly any grooves or holes in which dirt could accumulate. It requires no wiring and is opened using a key transfer system. Another special feature is the safety key function, which offers optimum protection by removing the safety key. If the operator has to enter the danger zone, he can personally secure himself by taking the key with him. The highly coded keys can be labelled and colour-coded. A module with just one lock can also be used for smaller openings or openings that cannot be accessed.



MOSAIC safety control unit and mGard key transfer system with removal unit

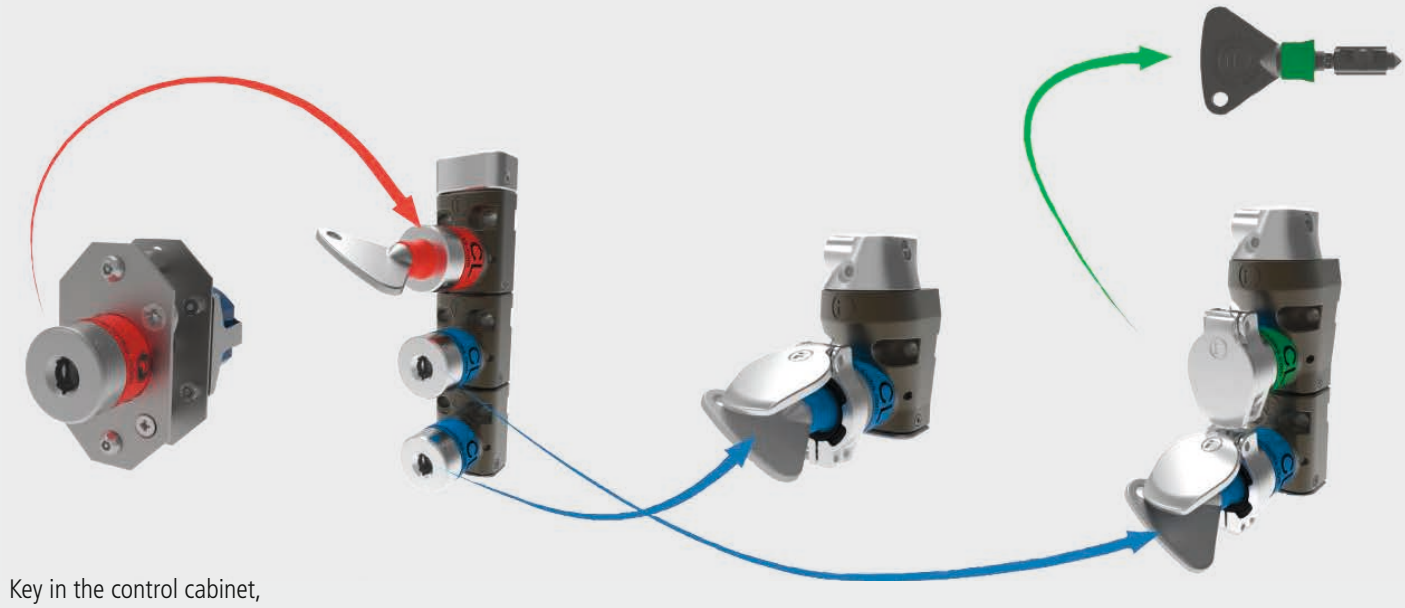
# DID YOU KNOW...

**… that DIN EN 415-10:2014 in chapter point 5.16.2.3, also proposes the possibility of using key transfer systems with a safety key**

DIN EN 14119:2003 also describes key transfer systems, specifically as a locking device based on the transfer of a key between the key switch and the lock. The system is characterized by the key, which is always held either in the key switch or on the key lock. In concrete terms, this means that the key is only released when the safety guard is securely closed and locked.

A combination of different processes is also possible, as shown in the drawing below.

- When the plant is stationary, the key is first removed, which interrupts the safety circuit via positively driven contacts.
- With the red key, the operator can now release two additional blue keys in a purely mechanical 'key exchange box.' These keys are used to open a flap and a door. For the hatch, which is inaccessible, a simple lock is used. The blue key is inserted, thus opening the hatch. While the hatch is open, the key cannot be removed.
- A double lock with similar logic is used for the door that can be accessed. However, the operator also removes a security key (green) with them into the plant. This key is used for personal security. To start the plant, the entire procedure must be carried out in reverse order. The keys are highly coded with well over 1000 codes in accordance with DIN EN 14119:2013.



Key in the control cabinet,
Key lock connected with security system

Key exchange station

Flap

Door

# Set-up mode

Safe speed monitoring with the MOSAIC safety controller, ZEUS enabling switch, EDI emergency stop button, Simplifier push-button elements

## Enabling switch ZEUS

If it is necessary to provide the operator with a special operating mode for tasks such as commissioning, maintenance, repairs or setting up processes, important legal requirements must be considered..

One option proven effective is the enabling mode. In this operating mode, the machine operator has the option of bypassing certain safety devices such as safety doors by selecting the operating mode and activating the enabling device. Important here, is the 3-stage function..

Only, in the centre position, does the 3-stage enabling switch allow certain potentially dangerous movements under additional precautions. If the operator releases the enabling switch or presses it through to level three, the system switches off for safety.

# DID YOU KNOW...

**...what requirements EN 415-10 places for a safety PLC?**

Under point h) of DIN EN 415-10, section 5.16.3 describes the activities with open guards. Set-up operation with the guard open, is therefore only permitted at reduced speed, reduced power, reduced pressure or reduced energy supply. A safety controller can be used to evaluate these parameters.

Section 5.14.7 also describes the stopping time. The machine's safety controller must ensure that potentially dangerous functions stop after a guard is opened and that the safety distance is maintained.

If this cannot be implemented, the standard prescribes the use of guards with guard locking. For further details and the requirements for guard locking, please refer to DIN EN 14119:2003, chapters 5.7, 5.2 and 5.3.


Sicherer Drehgeber zur Drehzahlüberwachung

## Safe speed monitoring

In case the stopping time of a system is not the same in all situations and a safe delay time for opening an interlocked safety guard (safety switch with guard locking) is not possible, safe standstill monitoring is often used. The MOSAIC safety controller from the Italian manufacturer REER provides economical and simple, safe speed and standstill monitoring. MOSAIC can monitor existing rotary encoders, evaluate inductive sensors for speed monitoring, or implement safe standstill and speed monitoring with safe rotary encoders up to performance level PLe. It is modularly expandable and is therefore suitable for use in systems of any size.

## Aventages

- ✓ Speed monitoring (up to PLe)
- ✓ Standstill monitoring
- ✓ Maximum speed monitoring
- ✓ Detection of speed ranges
- ✓ Monitoring of the direction of rotation

MV0 – Module for the connection of 2 inductive sensors

MV1 – Module for 1 rotary encoder and 2 inductive sensors

MV2 – Module for 2 rotary encoder and 2 inductive sensors

# Speed monitoring

## Set-up mode with open door

If the door needs to be set up with the door open, the ZEUS enabling switch can be used with the MOSAIC safety control unit. This allows the system to be set up at reduced speed.

### MOSAIC monitors...

- ✓ the two-channel key switch in set-up mode,
- ✓ the two-channel emergency stop buttons on the ZEUS and on the machine,
- ✓ the two-channel enabling switch for the enabling function,
- ✓ the OSSD signals of the:
  - safe locking device or guard locking,
  - safety light barriers.

### It checks...

- ✓ the safe speed of the drives:
  - existing rotary encoders sine/cosine, TTL/HTL,
  - inductive sensors,
  - safe own encoders,
- ✓ the safe direction of rotation of the drives:
- ✓ safely reduced pressure due to safe analog inputs.

## Safe unlocking of the guard locking for personal protection at standstill

If a packaging machine cannot be stopped within the safe stopping time of one second, or if it is not possible to maintain the safety distance of the following dangerous movement, guard locking devices must be used for personnel protection.

### MOSAIC monitors...

- ✓ the safe OSSD outputs of the guard locking for personal protection.

### It checks...

- ✓ the safe standstill of the system with safe standstill monitoring,
- ✓ with the safe analog inputs:
  - analog pressure sensors,
  - analog temperature sensors,
- ✓ releases the safe guard locking via a safe OSSD output or safe relay outputs,
- ✓ can release doors after a certain time, via logic and timer modules.

# Decentralization

WIRELESS


Safety components can be easily connected and integrated

**Safety Simplifier – the decentralized safety controller for the packaging industry**

In the packaging industry, the requirements for networking decentralised safety components are growing.

The Safety Simplifier offers the perfect solution: with its secure wireless or CAN connection, it enables flexible and simple coupling.

Up to 16 participants, with a total of 256 inputs and outputs, can be reliably networked, which minimises wiring work and simplifies installation. This saves time and increases the safety of packaging processes thanks to the seamless integration of all safety components.

- ✓ Programmable safety controller
- ✓ 14 safe I/O's + optional 2 safe relay outputs
- ✓ two-way communication
- ✓ networking of up to 256 I/O's


IP 65

40 mm width for mounting on aluminium profiles

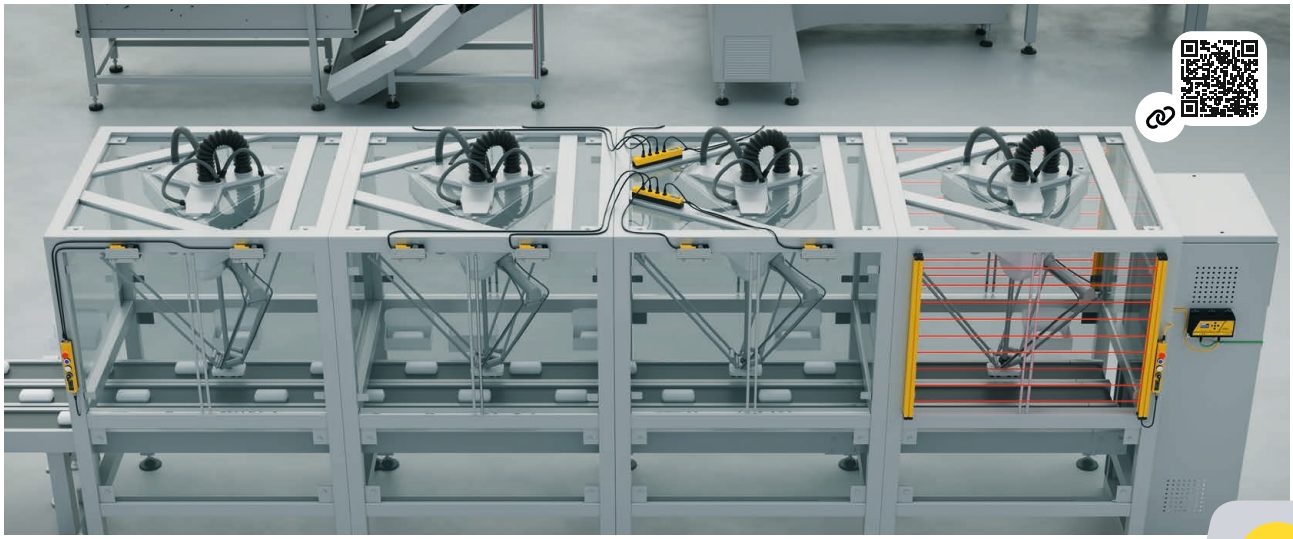
Spring terminals secure the connections also in case of strong vibrations

4 relays for 2 × double-safety outputs (optional)

LED diagnosis using the touch pad

Memory card with application software for easy exchange

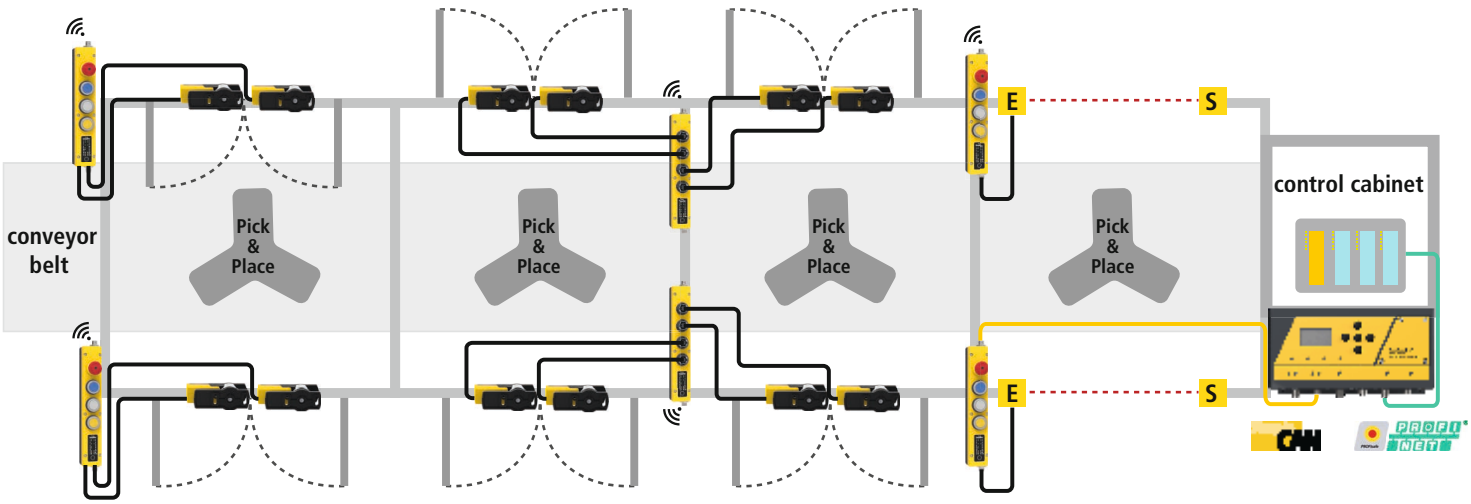
# PROFIsafe Safeguarding



**Simplifier System: Optimal PROFIsafe connection for your system**

The Simplifier Gateway enables a decentralised safety architecture that can be easily integrated into existing Profisafe control systems. External safety components are simply connected to the control units, and the seamless connection via the GSMDL file allows full integration into higher-level safety systems.

- ✓ **Decentralised safety architecture:** Optimises setup and reduces cabling effort
- ✓ **Flexible connection:** External safety components can be easily integrated
- ✓ **Seamless integration:** Transfer of the safety functions via Simplifier Gateway to the main control unit



# Operating elements

## Operating elements for all applications

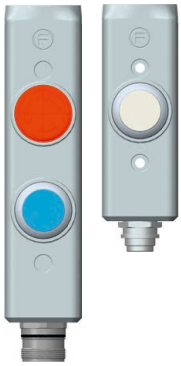
The SSP operating elements can be used in a wide range of applications, from the simplest to the most demanding environmental conditions, that require ECOLAB and IP69K certifications. With compact housing dimensions of less than 40 mm, the operating elements of the EDI series and the tGard series, can be easily mounted on standard aluminium profile systems. Numerous individual designs and button configurations can be realized with Fortress switches, and thus adapted to different application conditions.

### EDI series

**EDI emergency stop button and operational units**

Narrow housing shapes with holding brackets for quick assembly.

### tGard series



**tGard operating elements**

Modular operational unit with up to 9 buttons.

**amGard S40operational units**

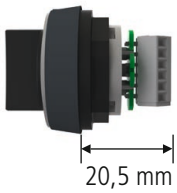
Modular operational units with up to 3 buttons in stainless-steel and IP69K.

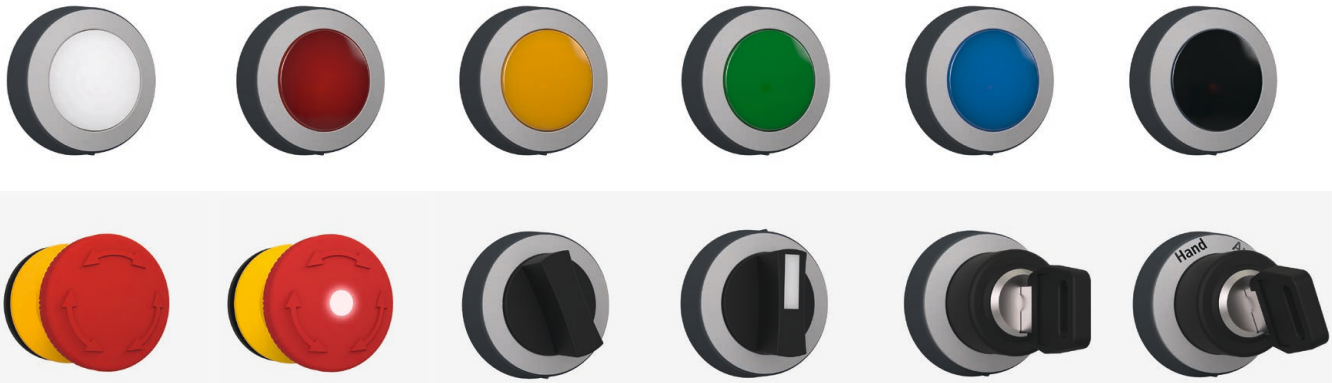
# Buttons

**Switch elements for control cabinets and operating panels**

The command and signalling devices, in the Simplifier and EDI series, are easy and flexible to integrate. Thanks to their high degree of IP67 protection and partially IP69K, the areas of application are universal. The robust design of the control devices, combined with modern design and optimum functionality, forms the basis for a safe human-machine interface.

Simplifier series provides fast connection with spring-loaded terminals. Optimal for installation in control cabinets and machine profiles due to a flat installation depth



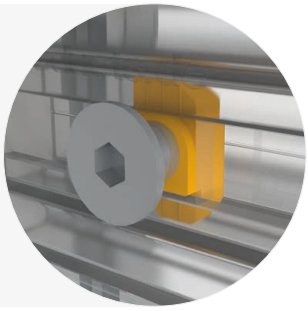

# Safety fence systems

## Aluminum profile

Anodized 44 × 44 mm profiles, with an 11 mm groove, form the basis of the SSP protective fencing system. Other, matching profile sizes, can be easily combined with each other. TDue to the special design, the profiles are light but still stable.

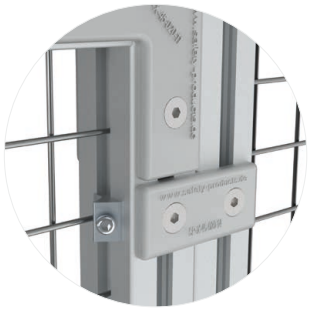
## Slot nuts

The basis of the SSP Fast Connect technology are the slot nuts. They position themselves in the groove when screwed in and allow fast assembly.



## Fitting technology

The combination of fittings and slot nuts enables uncomplicated connection of the individual aluminum profiles. Drilling and thread cutting is not necessary. L, T and I fittings ensure stable and flexible mounting of aluminum profiles.



## Fillings

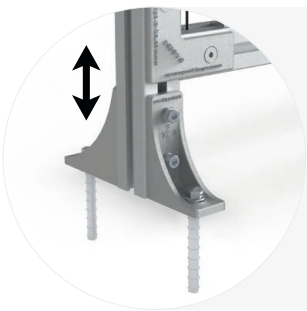
A wide range of fillings made of different materials for safety and functionality. From spot welding grid to transparent polycarbonate and opaque sheet metal to special fillings such as fine real glass.

### Grid fixation

The SSP grid fixation ensures a solid connection between the profile and the filler. It increases the total stability of the safety fence.

### Clamping strips

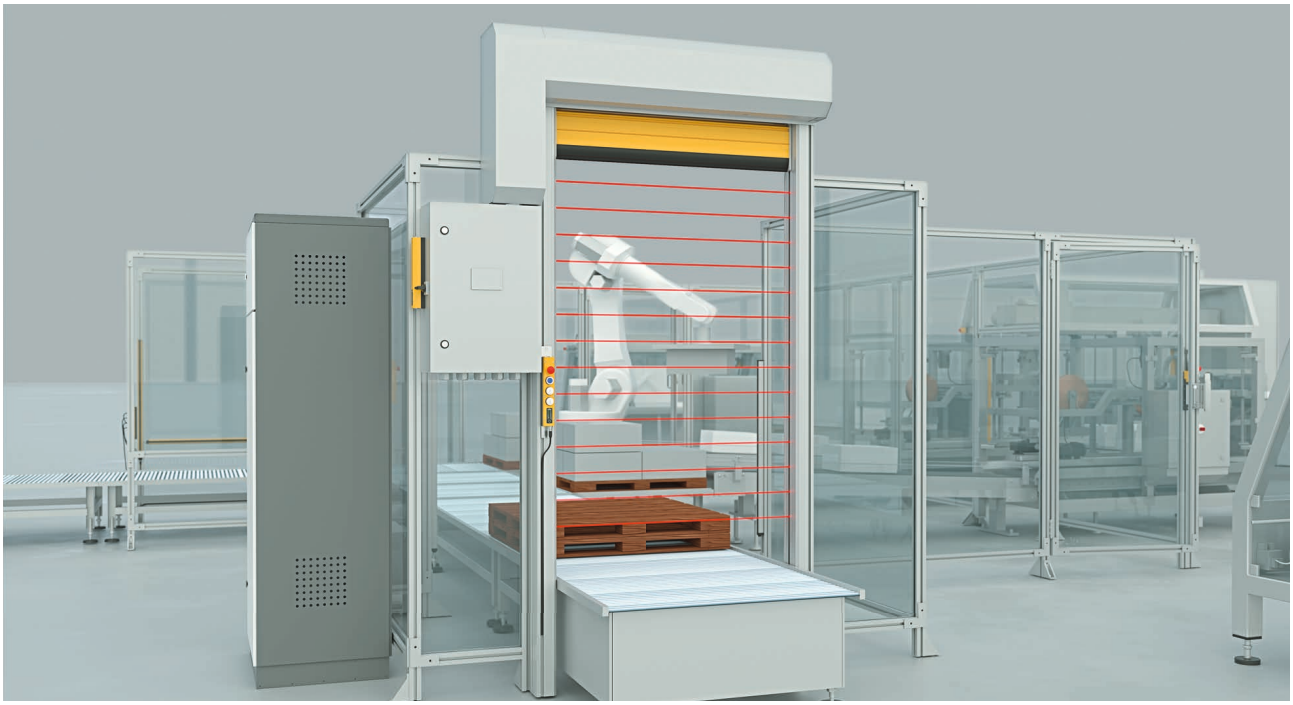
Polycarbonate, sheet metal or real glass fillings are additionally fixed with clamping strips. This stabilizes the connection and reduces vibrations.



### Floor attachment

The combination of floor attachment bracket and aluminum profile compensates for any unevenness. The floor angles can be mounted at different heights. Expansion anchors provide a firm hold in the floor..

# High-speed door



High-speed door with leading safety light barrier for pallet infeed

### High-speed doors with minimum space requirement

High-speed doors are frequently used for pallet feeding. Opening speeds of up to 2.5 m/s, ensure a smooth process with the shortest cycle times. The extremely robust design, and the antistatic surface of the door curtain, are ideal for the packaging industry in particular. The integrated light beam takes over the function of the safety edge — contactless and therefore wear-free. This ensures early, collision-free detection of objects, which are reliably detected during the travel movement. The integrated non-contact safety sensor, SAFIX 3, monitors the position of the rolling gate.

Nordic Door high-speed doors are characterized by narrow frames of only 80 mm, enabling compact system cells. Thanks to the arrangement of the upper roller shaft at the rear of the door, the design is attractive and offers the operator greater safety. A forklift can move closer to the cell when loading or equipping it.

### Function

- ✓ Alternative drive systems with or without vector inverter control.
- ✓ Flexible motor bracket with 4 alternative motor positions: up/down/forward/back.
- ✓ Sophisticated bracket for the contactless switches, with which the position of the door can be easily adjusted to any opening height.
- ✓ Efficient stop holder with damping effect.

# Safety Consulting

**We provide assistance to all machine safety related questions.**

Be perfectly prepared with the safety experts at SSP. We support our clients in all matters of machine safety and automation, from consultation up to implementation.

## Machine manufacturer

**Supporting services for the safe design and realization of machines.**

Risk assessment

Safety concept

Safety validation

Documentation

Assistance with the CE declaration of conformity

## Machine operator

**Services for the safe use of machines.**

Risk assessment

Norm research

Safety Support Day

Staff training

Regular inspections

Inspection of new machines

Safety concepts

Retrofit

**Service**

Safety System Products

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