SAFETY SIMPLIFIER

Safety controller

WIRELESS
SAFETY

SSP
Safety System Products

Innovation
Safety Simplifier

New approach of wireless safety

INDUSTRY 4.0

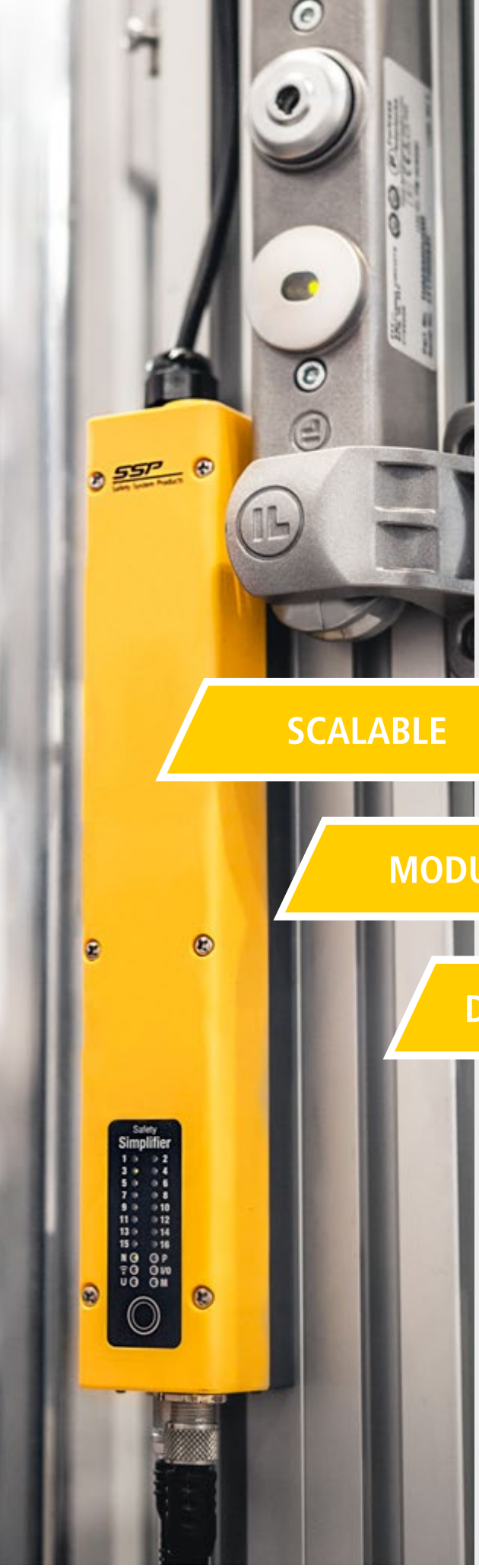
With over 20 years of experience in developing safety products and safety controllers, Mats Linger (SSP North AB) and Johann Aulila (SSP GmbH & Co. KG) have developed the Safety Simplifier safety controller. In this way, they continue the once successful and innovative cooperation with Jokab Safety in Germany and Sweden.

Safety technology has become a demanding discipline in modern factory automation, where safety solutions are becoming a decisive efficiency factor. We at SSP committed ourselves to the 'we simplify safety' mission. However, with this goal in mind, just to modify or improve existing products is not enough: We re-define safety. In the form of a smart product that can be easily, variably and modularly implemented in fully automated processes and that still meets all normative requirements.

We re-define safety. In the form of a smart product that easily meets all normative requirements.

Mats Linger

Johann Aulila



The result is the Safety Simplifier, a wireless safety controller that is not installed in the control cabinet, but directly on the machine or system in a modular way. With a multi-master concept, the Safety Simplifier ensures that safety signals reliably reach their destination by the fastest route.

Alternatively, a wired CAN solution is also available. Light curtains, door guards, safety sensors and much more can be evaluated directly on site.

SCALABLE

MODULAR

DECENTRALIZED

Content

we simplify safety

Safety Controller

Modular - decentralized - scalable

MODULAR **DECENTRALIZED**

Modular extension of the safety inputs and outputs without additional modules

- ✓ 14 safety inputs and outputs in each Safety Simplifier
- ✓ optional 2 double relay outputs
- ✓ expandable up to 256 safety inputs and outputs
- ✓ Cost saving

Decentralized structure, flexible and simple

Networkable with up to 16 Safety Simplifiers via the safe CAN or wireless interface. Reduces significantly the planning effort and costs for cable routing.

Simplification of diagnosis

Using free software, the gate way can transmit all relevant diagnosis information to a standard PLC, a hardware gateway is not necessary.

INDUSTRY 4.0

SIEMENS
ROCKWELL
BECKHOFF, B&R
CODESYS 2
CODESYS 3

OFF-THE-SHELF SOLUTIONS

THOUGHT AHEAD

Combined functions

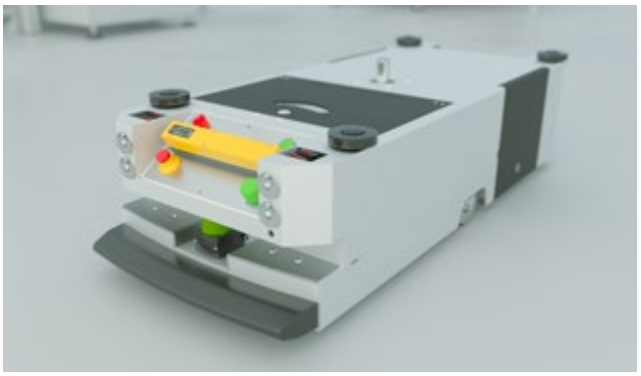
Safety controller and operating elements intelligently combined in one housing. Safety-related sensors such as safety switches, safety light curtains or emergency stop buttons are monitored directly on site.

Intelligence in detail

Only one input or output is required for illuminated buttons. Intelligent functional modules enable the evaluation of the button and the simultaneous control of the LED on a connecting pin. This is just one of many unique features that reduce costs and increase system flexibility.

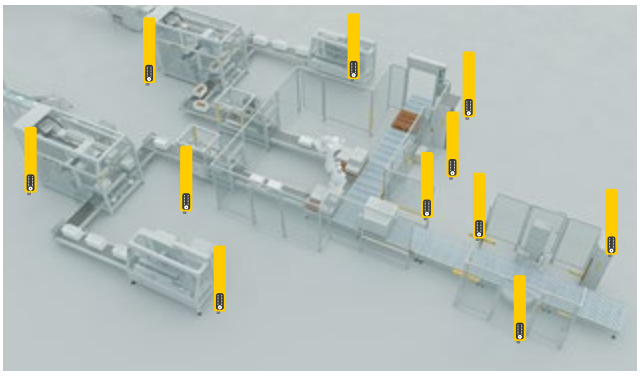
Safety Simplifier

Protection of automated guided vehicles



With the Safety Simplifier, automated guided vehicles can be switched off safely and wirelessly. Safe networking to production plants is possible at any time.

Safe plant linking



In the mesh network, several safety functions of linked plants can be exchanged easily, decentrally and without wiring effort.

Innovation

Safety Controller

many applications & functions

- Decentralized safety control
- Safe communication
- Wireless Safety
- Configuration software

Safe wireless distributors

The safe wireless distributors from SSP enable networking and decentralized configuration of up to 16 units acc. to PLe. Each safe distributor contains 14 safe inputs/outputs, which can be flexibly configured.

Interlocking function for flexible material transport

For the safe unloading of complex pallets or small components, the SSP ready-to-use interlocking function can be used.

Application areas

Control cabinet unit

External mounting on the control cabinet saves space. Thanks to the LED display, diagnosis can be done without opening the control cabinet.

Evaluation of safety switches

SSP provides ready-to-use plug & play modules for the evaluation of safety switches, light curtains and many more.

SIL3
PLe
Kat.4

Wireless Safety
The flexible and safe solution for decentralized applications.

Safe communication
Flexible in application, thanks to high safety up to SIL3 - PLe - Category 4.

Decentralized safety control
16 safe inputs and outputs can be configured flexibly and individually.

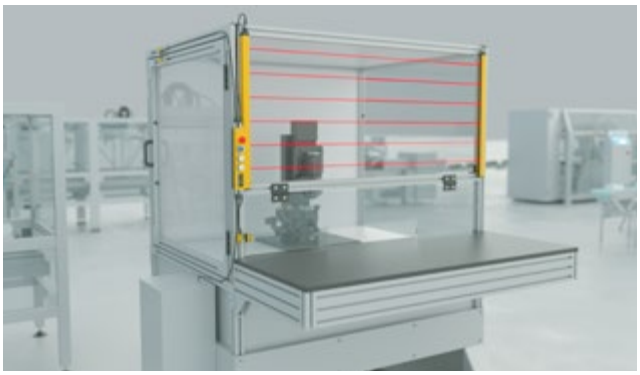
Software

Configuration software Simplifier Manager
Predefined functional modules for easy and fast programming.

WIRELESS

PLC

Safety technology without control cabinets



The communication does not necessarily have to be wireless. The Safety Simplifier can also be used as a stand-alone solution for small systems and does not require space in the control cabinet.

Mesh network

Using a wireless mesh network, the Safety Simplifier ensures that your safety signals reach their destination reliably and safely by the fastest route.

Hardware components

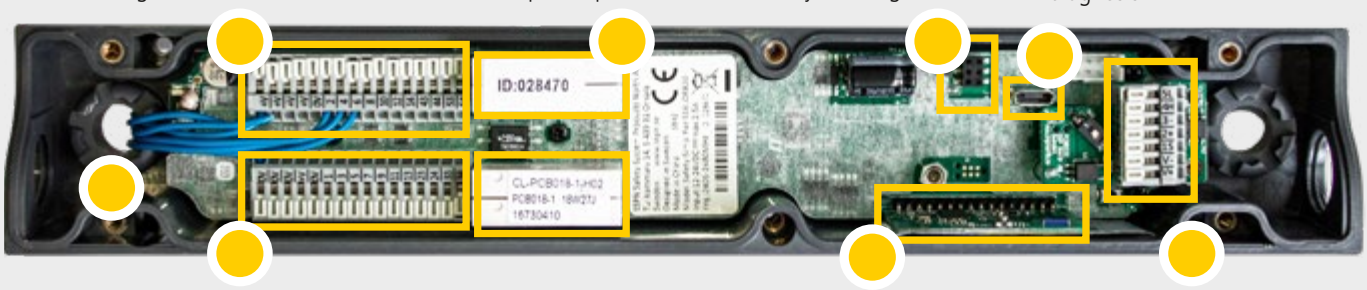
Innovative and functional

Spring-loaded terminals secure the connections also in case of strong vibrations

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

Memory card with application software for easy exchange

USB interface for programming and diagnosis



Feed-through to the control cabinet

14 I/O's as safety inputs or redundant OSSD outputs

Safe wireless interface (optional)

Safe CAN interface (optional)

Four different hardware versions of the Safety Simplifier are available for the areas of use and applications:

Hardware version	14 safe I/O's	Double safe relay outputs	Safe wireless communication	Safe CAN communication
S14_ _ _ _	✓			optional
S16_ _ _ _	✓	✓		optional
S14_ _RB_ _	✓		✓	optional
S16_ _RB_ _	✓	✓	✓	optional

Safe CAN communication can be retrofitted at any time.

Configurable inputs and outputs

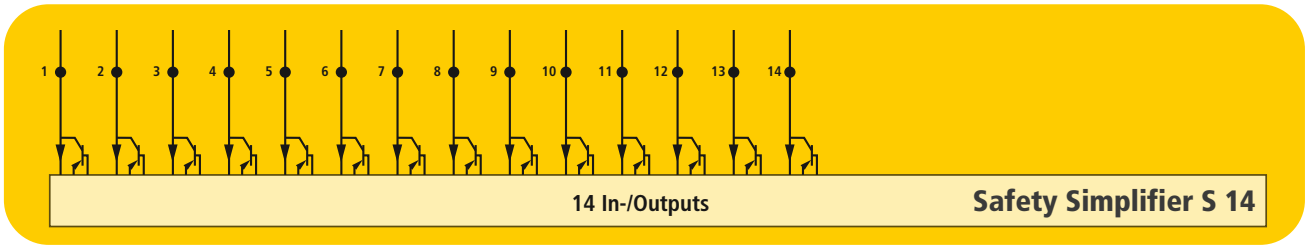
Modular design

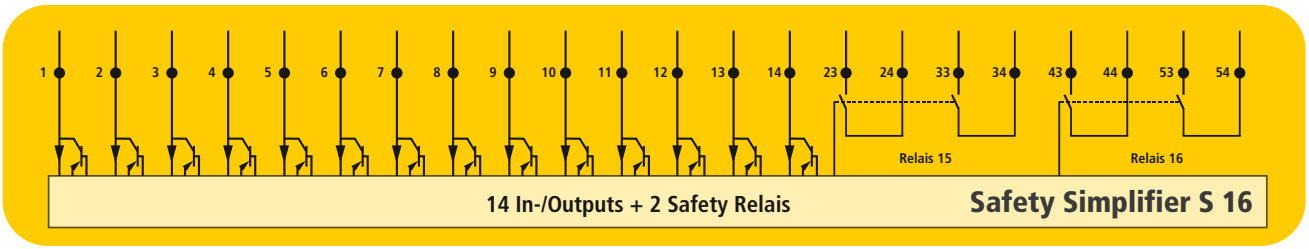
- ✓ Programmable safety controller
- ✓ Networking of up to 16 units
- ✓ Safe wireless or CAN network
- ✓ Two-way communication
- ✓ Networking of up to 256 I/O's

The requirements for safety technology in in factory automation and process industry are becoming increasingly complex. Especially in linked plants, a large number of safe sensors and actuators must be networked and intelligently connected.

With four hardware versions, the Safety Simplifier can provide the greatest possible flexibility. At the same time, the flexibly configurable inputs and outputs of each Safety Simplifier facilitate the simple creation of safety systems.

Commercially available safety controllers usually require different modules for functions as well as for inputs and outputs. These controllers have to be designed in advance or, if required, supplemented by a large number of input and output modules. The Safety Simplifier replaces the input and output modules with only one device.





Flexibility

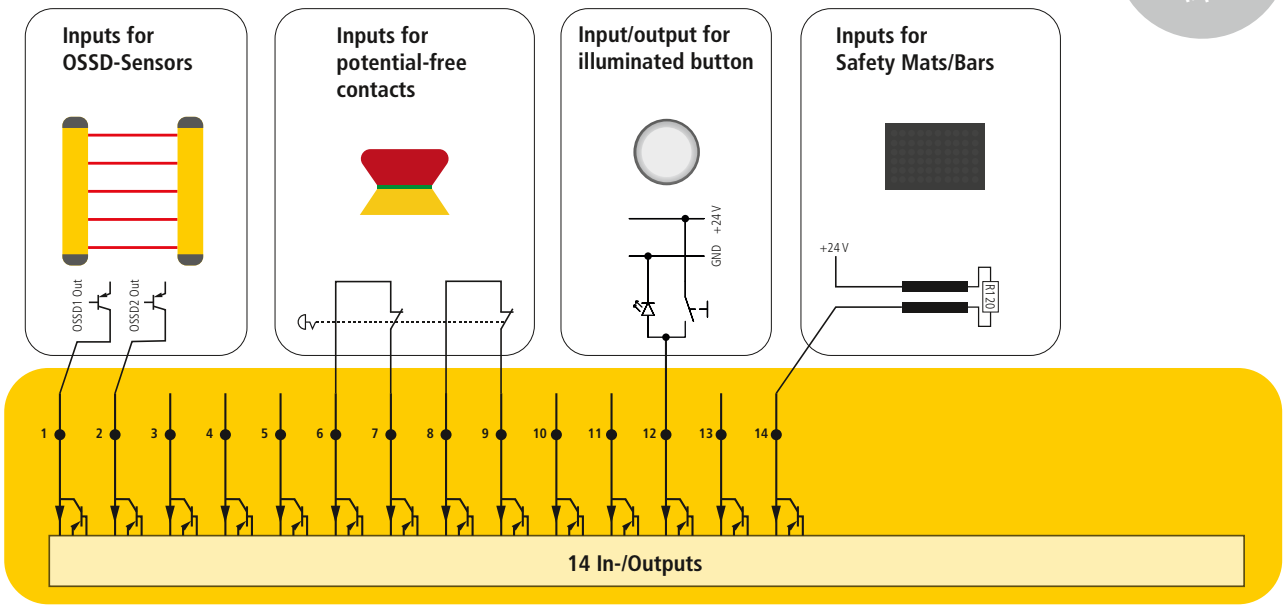
Flexible inputs and outputs

Safe, analog voltage inputs

Inputs

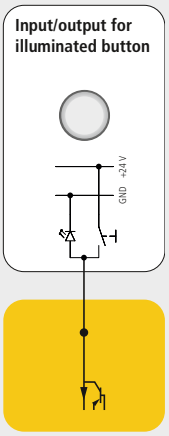
All state-of-the-art safety sensors can be connected to the Safety Simplifier. Each of the 14 connection terminals can be configured as input or output. In the "Simplifier Manager" software, the corresponding module is selected. By selecting the module the connection terminal is configured as an input. The safety modules evaluate OSSD signals, potential contacts or safety edges according to the requirements in a safe way.

INNOVATION reduced Inputs



Connection example, safe inputs to the Safety Simplifier S14

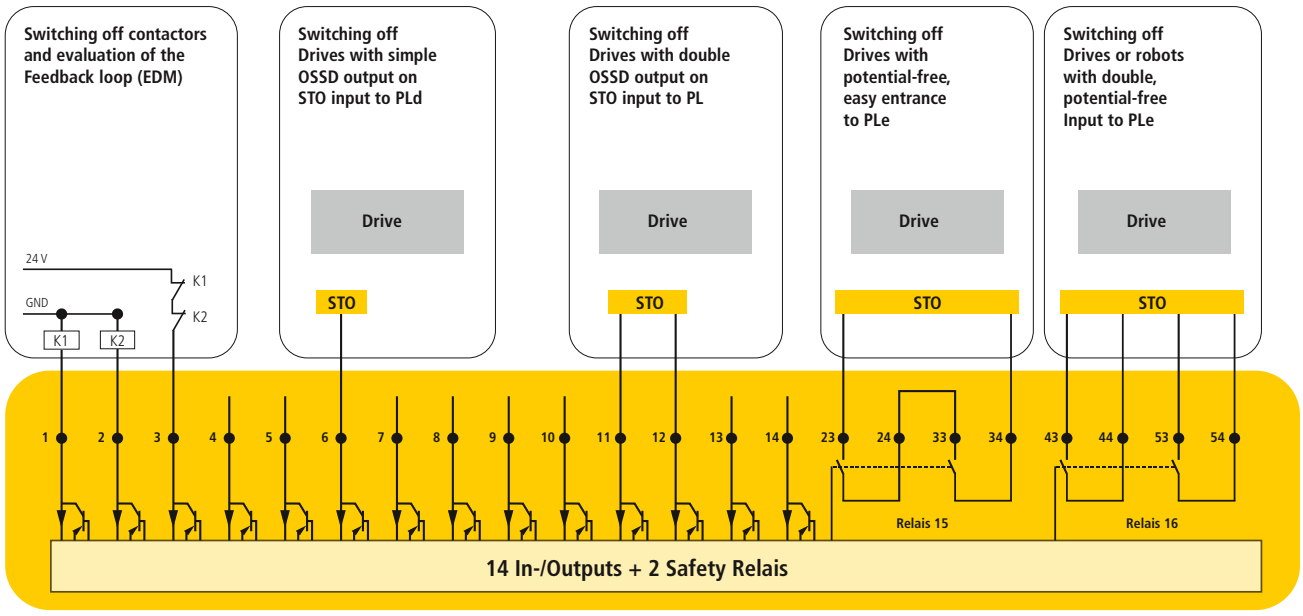
Software module for illuminated buttons



Innovative input and output functions reduce inputs and outputs

Our motto „we simplify safety" is also reflected in easy functionalities such as our illuminated buttons. Standard control units on the market require one input and one output to control the LED for the evaluation of the illuminated buttons.

The input and output function can be used simultaneously to control the LED with the output and to query the contact of the button with the input.



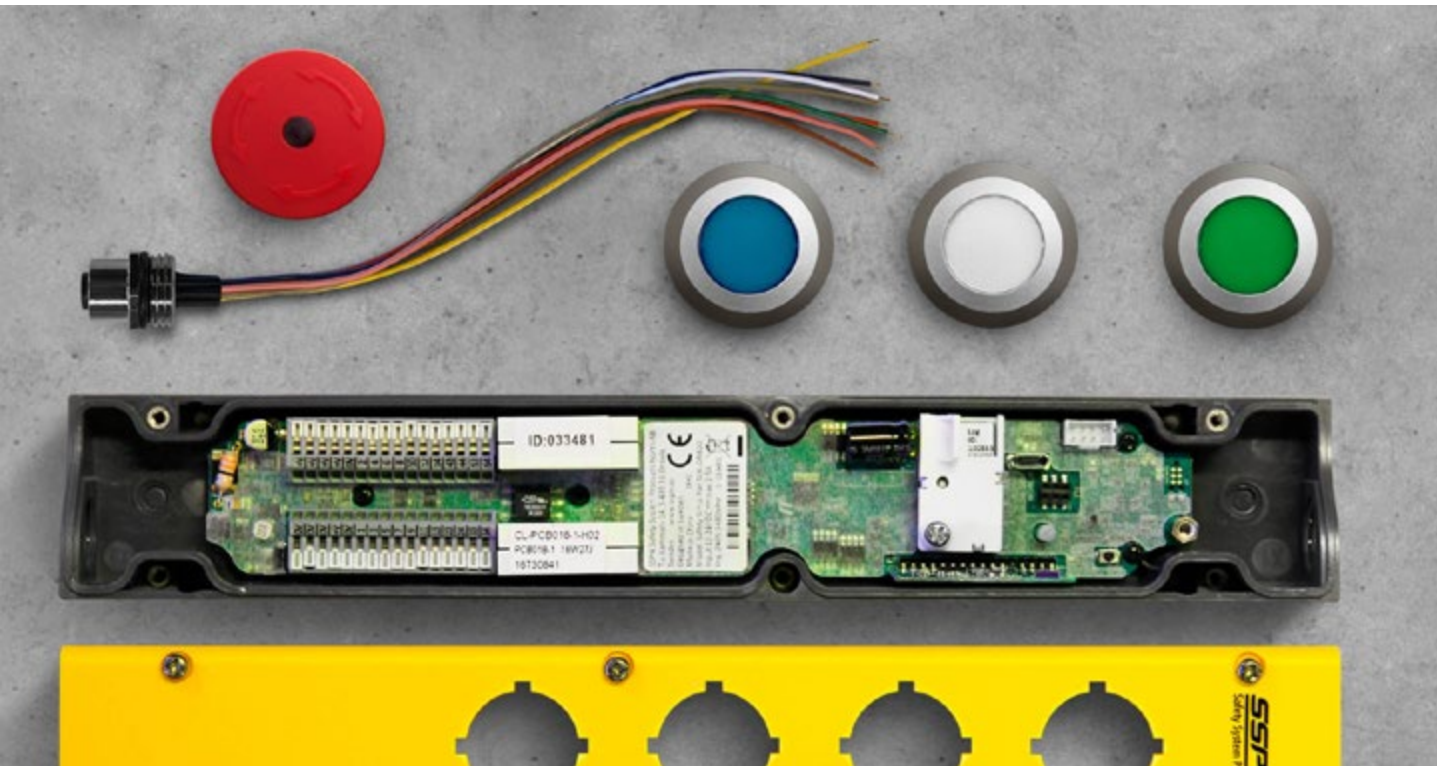
Connection example, safe outputs to Safety Simplifier S16

Outputs

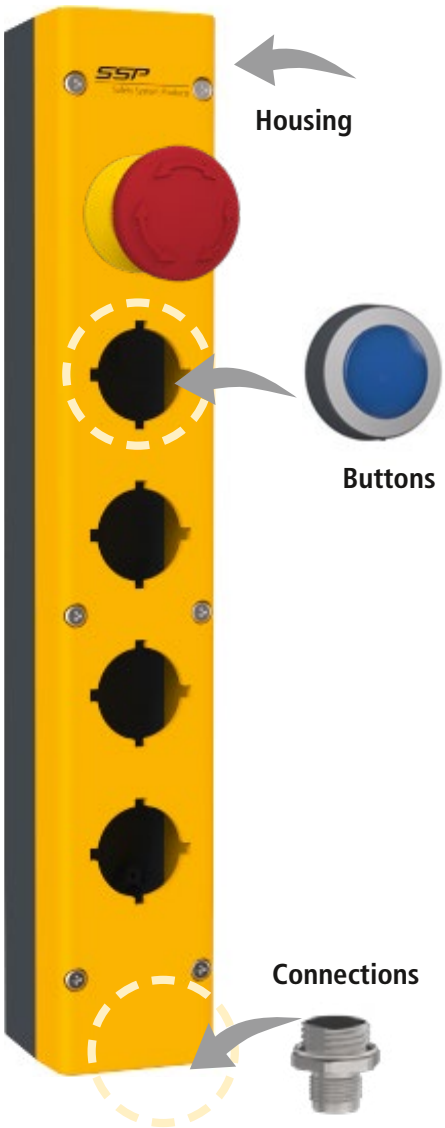
Flexibility in the outputs is an advantage of the Safety Simplifier, because all 14 digital inputs and outputs can be used as safe OSSD outputs if required. Optionally, the S16 unit also provides two pairs of potential-free relay outputs, In this way, safe actuators disconnect flexibly. The safe outputs up to PLd can be used on a single channel, and on two channels up to PLe. The digital outputs can also be used flexibly as non-safe outputs, for example to create info outputs or test signals.

Safety Simplifier

Individual selection option



Modular design



A wide range of housings, button types, lights and connection options provides a large selection of options for the individual Safety Simplifier. This means that a customer-specific configuration can be arranged for each application and requirement.

Even more options are available when two housings are connected together. A connection system with seal ensures that the IP65 protection class is still provided.

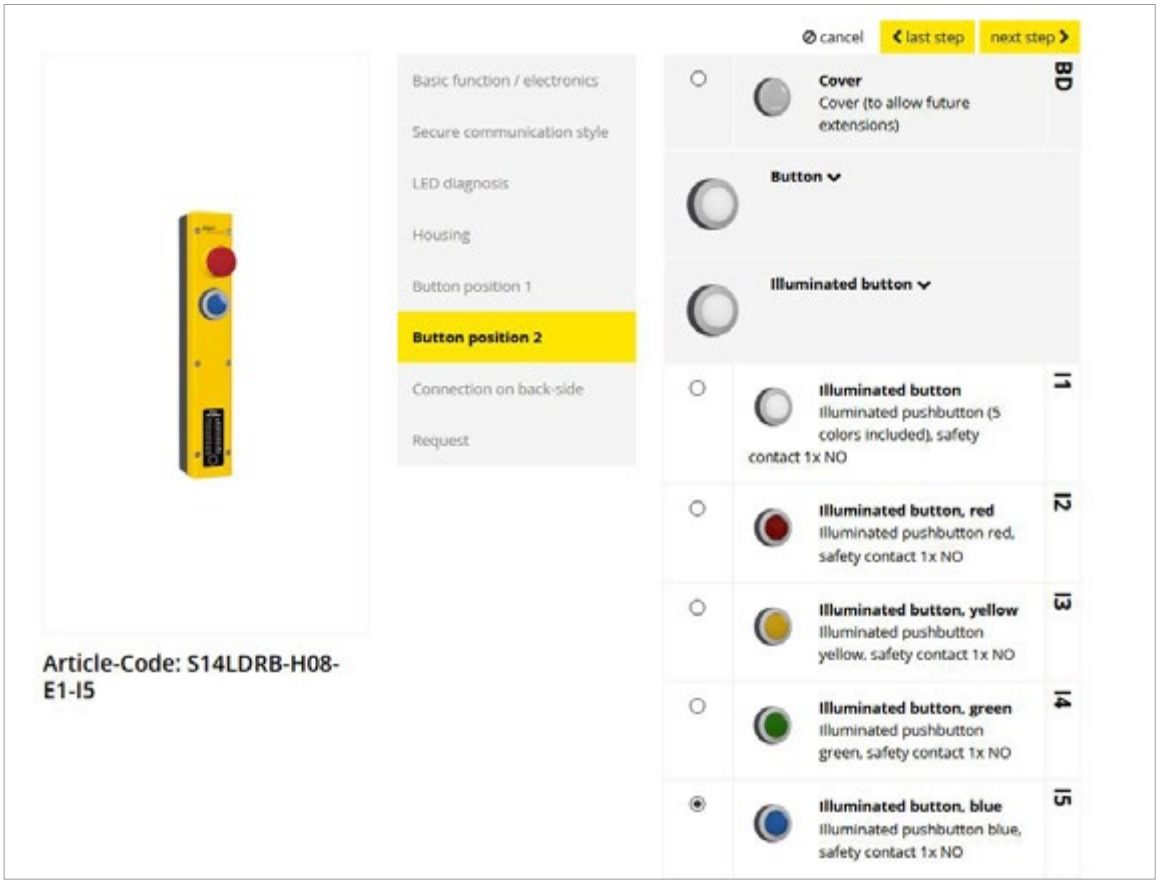
Options

To get more options, up to two housings can be connected together. A connection system with seal ensures that the IP65 protection class is provided.

Individual configuration

The modular Safety Simplifier can be adapted to a variety of applications. Individual operating elements and communication variants, such as the safe wireless or CAN interfaces, can be combined in any way. Connection options for the control cabinet and for safety devices can be realized with different plug connectors.

Data sheets and technical data are automated and generated in real time by the configuration software.



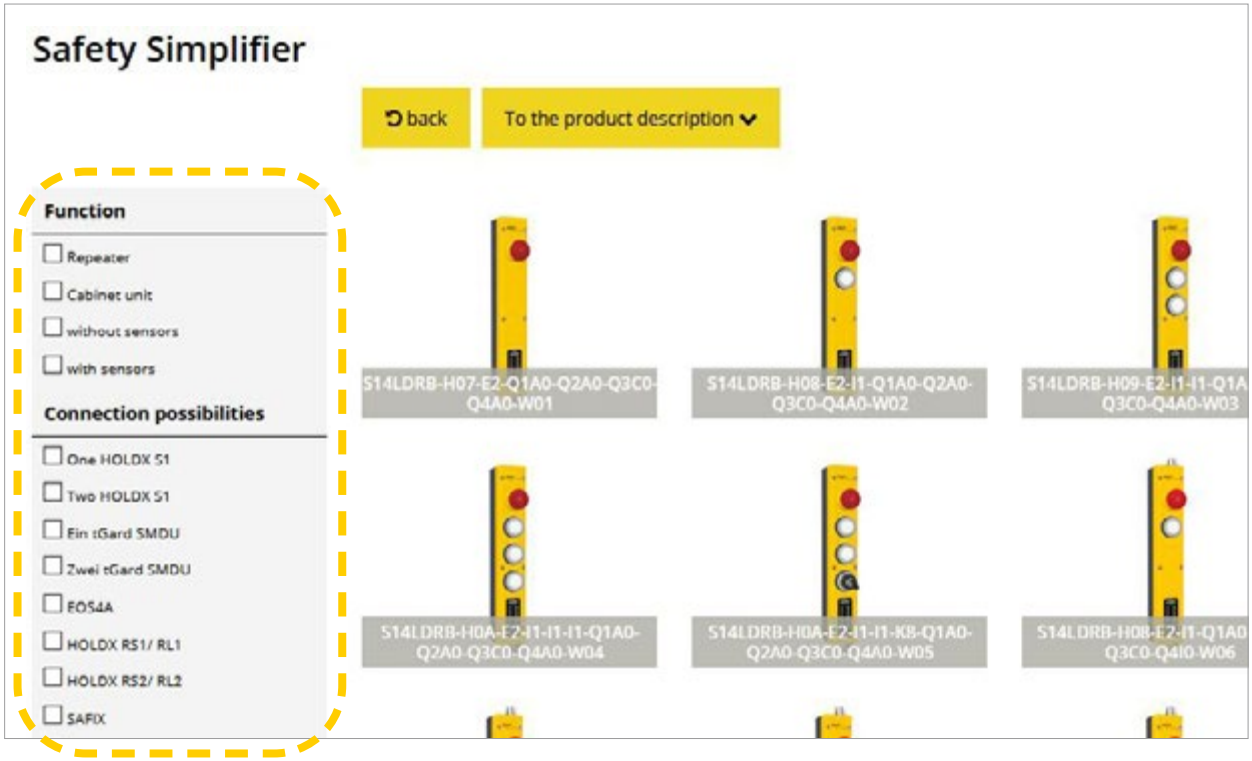
Extract from the online configuration software

Online configurator

Configure your individual Safety Simplifier on our website!
www.safety-products.de

Standard configuration

Pre-wired standard modules



Plug & Play: The pre-wired Safety Simplifier standard variants can be directly connected and used. With the help of pre-configured connection options for safety solutions, such as safety switches or curtains, a plant can be put into operation in the shortest possible time without any wiring effort.

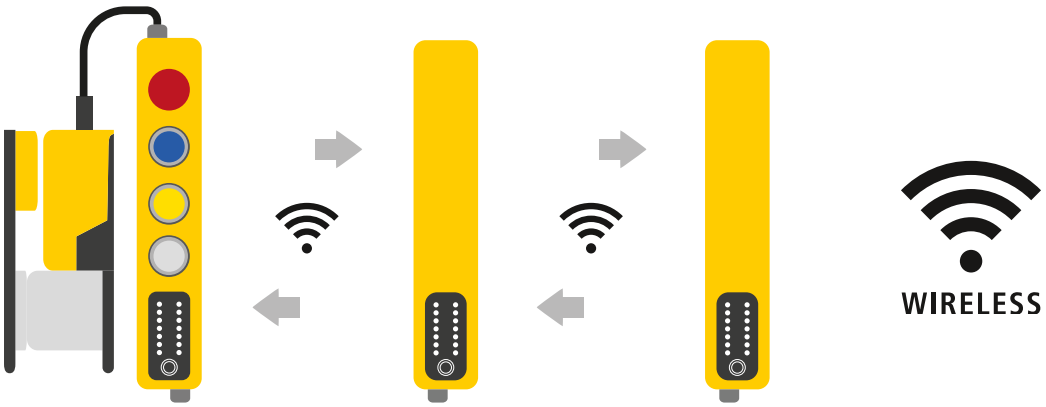
	Individual Modules	**Standard** Modules
Individually adjustable operating elements	✖	
Individual connection for safety technology	✖	
Eplan macros		✖
Available from stock		✖
Easy programming through pre-defined software programs		✖
Optimal use of I/Os	✖	
Fast commissioning through pre-wiring		✖

You can find our preconfigured standard models on the website

Safe communication

Safe wireless network and repeater function

Up to 16 Safety Simplifiers can be linked via the secure wireless network. The repeater function implemented as standard ensures optimum process reliability. Each Safety Simplifier shares the available safety information with all other Safety Simplifiers within its range. Two modules can communicate at a distance of up to 100 meters. For longer distances or in unfavorable environmental conditions, additional Safety Simplifiers can act as repeaters or a wired CAN connection can be used.

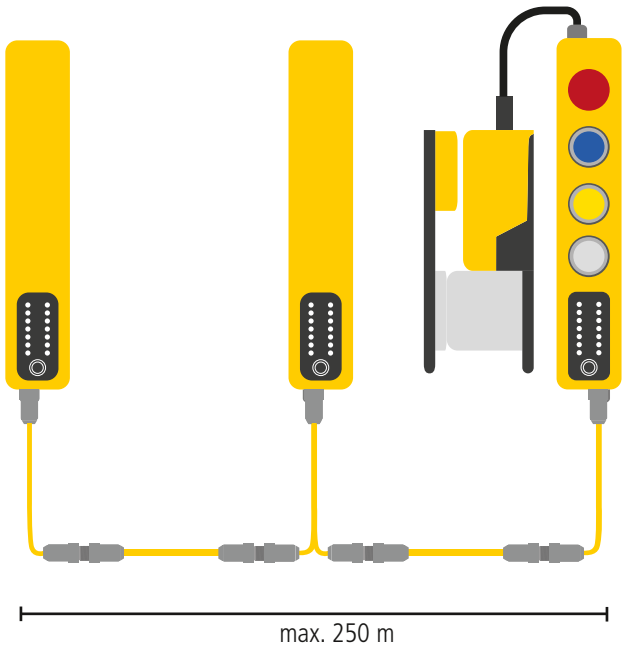


Safe combined networking of wireless and CAN

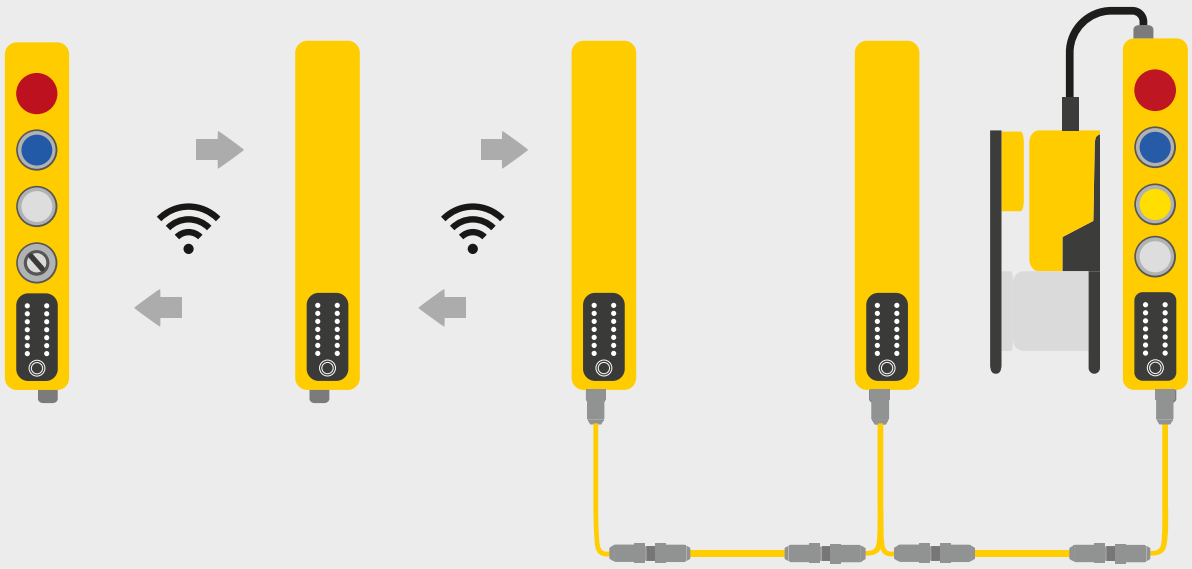
If safe wireless and CAN network are combined, the wiring effort can be reduced. The advantages of each individual type of communication are also available as combined network. In applications where a process-safe wireless connection is not possible, the CAN line of the the Safety Simplifier can be connected. In a system of 16 Safety Simplifiers it can be freely selected which units communicate via CAN or wireless connection.

Safe CAN network

If, for example, up to 16 Safety Simplifiers are networked via safe CAN communication, each Safety Simplifier in the system has access to all existing safety information of the other participants. The cable length of up to 250 m enables the application in large plants with longer distances.

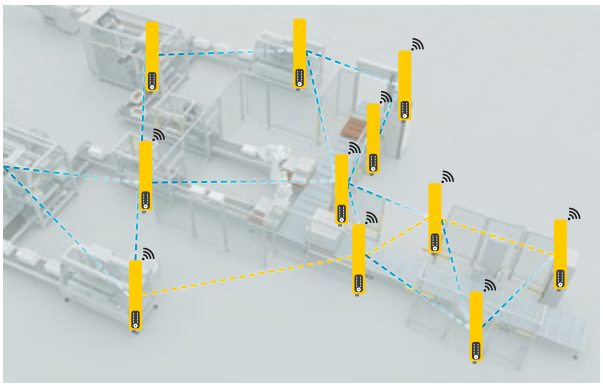


Safety CAN



Safety and wireless application

Mesh network for high availability



Via a fully automatic mesh network with repeater function, each Safety Simplifier shares its global information with all participants within its range. In order to achieve high reliability value, each Safety Simplifier reliably passes on its own information and that received from the other Safety Simplifiers.

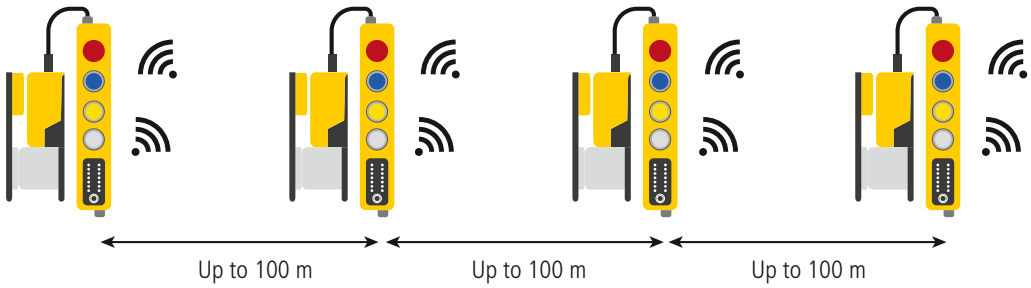
Independent wireless at 2.4 Ghz

The safe wireless communication of the Safety Simplifier works without any intervention in IT. The Safety Simplifier does not require any external repeater, but builds up its system independently. 16 channels, on a frequency of 2.4 GHz, are available for optimal implementation.

Software diagnosis for reliable applications

Diagnosis is especially elementary for wireless safety technology. The Simplifier Manager free software has implemented extended wireless quality diagnosis. This function allows existing networks to be easily checked and new plants to be designed quickly and fault-free.

Large operating ranges



With the Safety Simplifier, very large ranges can be realized. The range between two participants is up to 100 meters. The integrated repeater function effectively extends the range. Safety Simplfier repeater modules can also be integrated to increase the range or to optimize the mesh network.

?

Can wireless systems be safely implemented in an industrial environment?

Wireless safety - can it even be safe and reliable?

Many mechanical engineers and safety technology integrators frequently ask themselves these questions. While wireless systems have long been part of everyday life in industrial communication and private environments, safe wireless communication is still considered new territory in machine safety for some users.

But we guarantee: Safety (up to PLe), high availability and reliability are our top priorities!

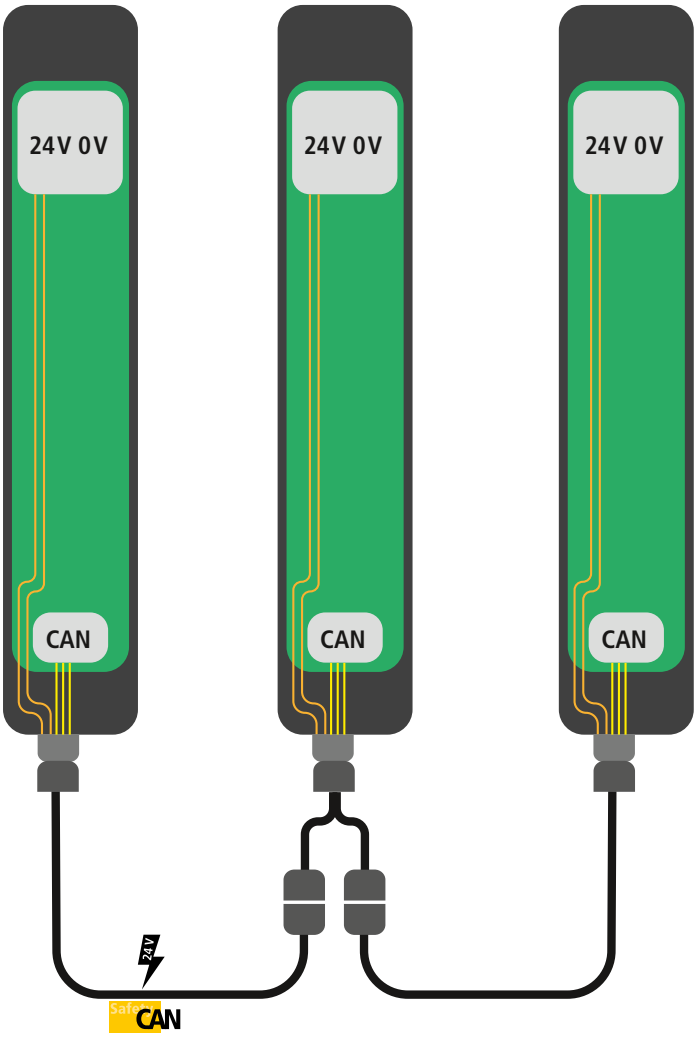
Safety and CAN

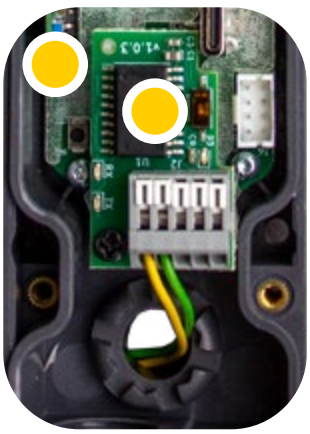
Safe CAN communication

By using safe CAN communication, the Safety Simplifier becomes one of the fastest decentralized safety controllers on the market. A safety light curtain connected to a Safety Simplifier can switch off a safe OSSD output at a distance of 250 m with an extremely short response time (<20 ms).

Advantages for the application with Safety CAN

- ✓ Fast response times of less than <20 ms
- ✓ Cable lengths up to 250 m
- ✓ CAN and power supply in one cable
- ✓ Up to 16 Safety Simplifier units connected in one network
- ✓ Up to 256 safe inputs and outputs can be networked



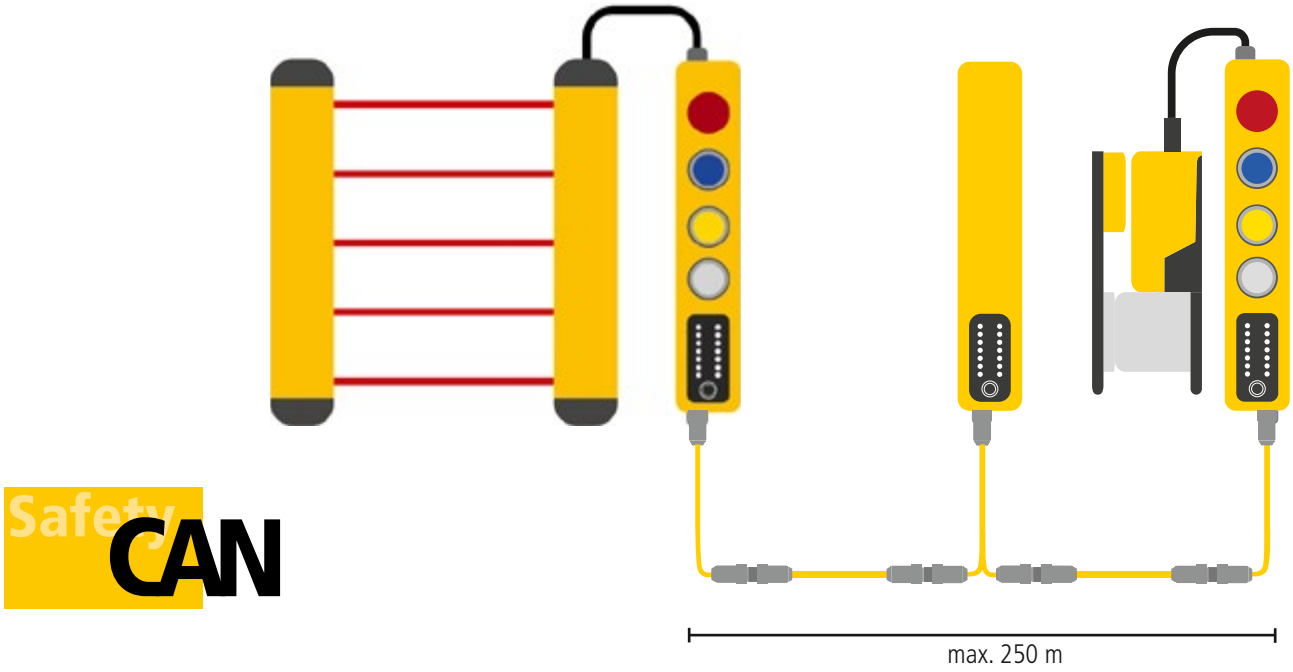


CAN-Card

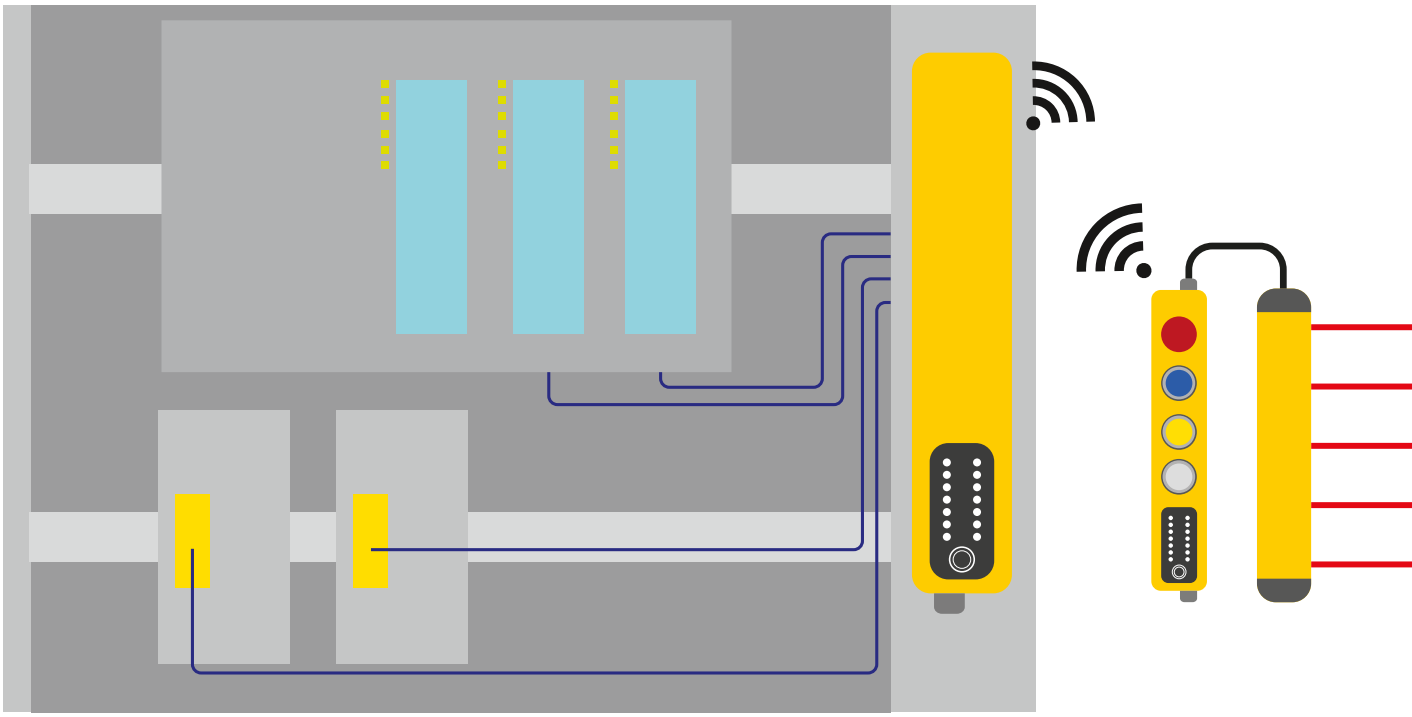
Terminating resistor at the last participant

Always flexible

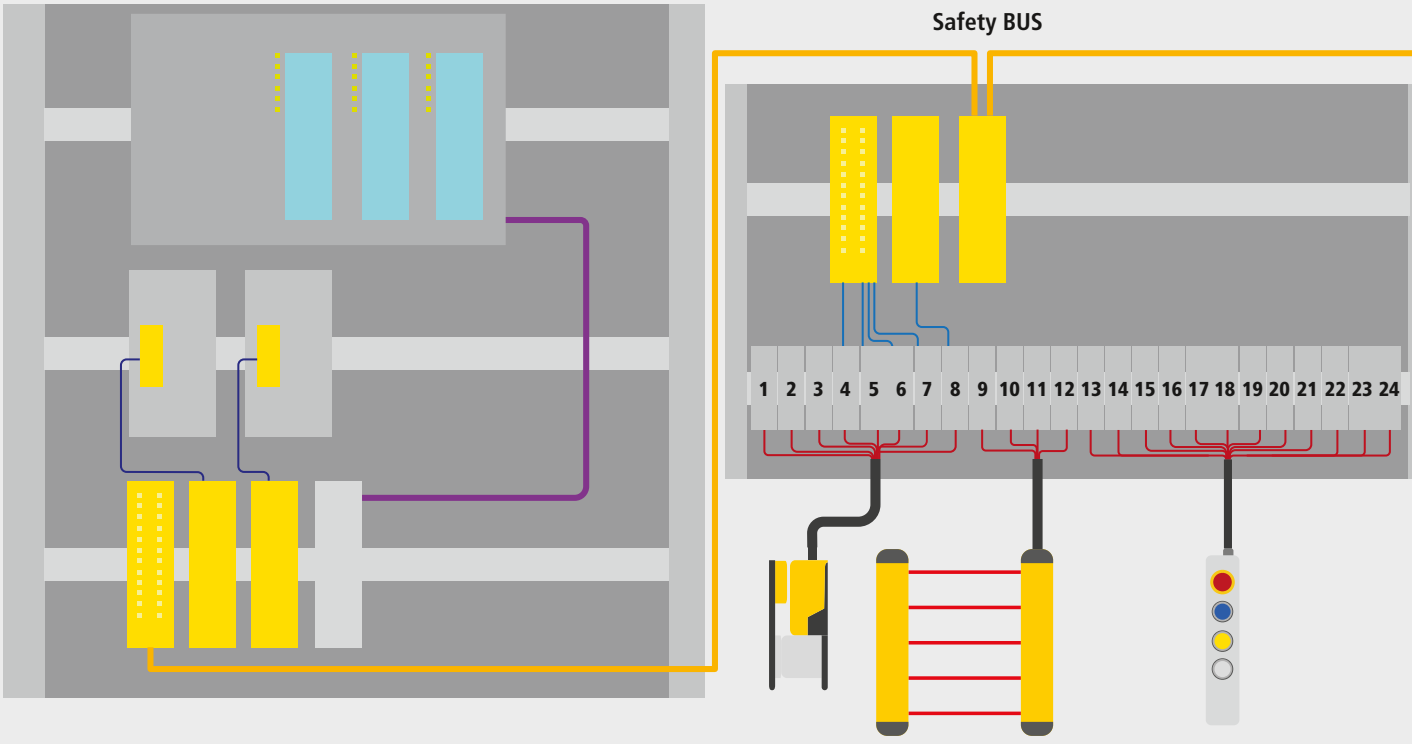
No matter which communication type: the Safety Simplifier always remains flexible.
Software already written in the Safety Simplifier does not have to be changed when the communication type changes between wireless and CAN.



Reduced wiring effort thanks to wireless

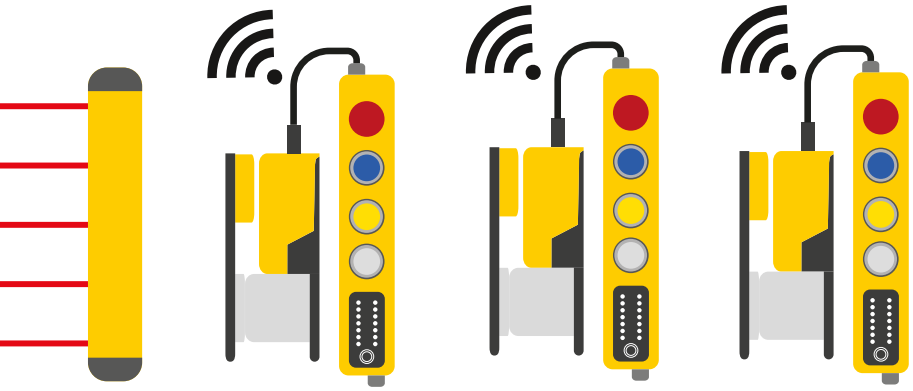


Not every decentralized structure of a



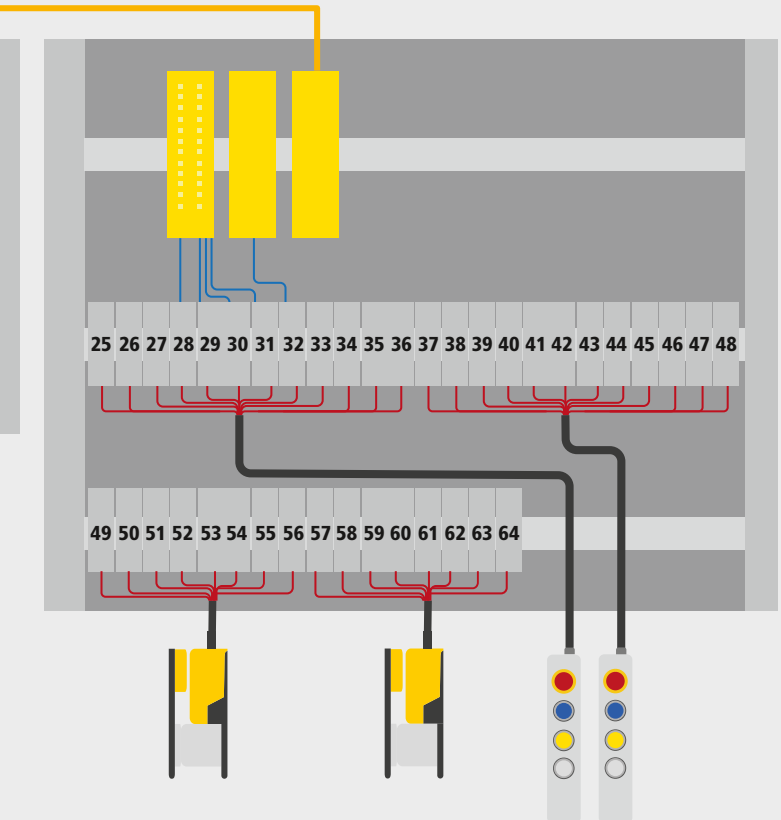
communication in a decentralized safety system

HARDLY ANY WIRING



- ✓ Significant reduction of the wiring effort
- ✓ Fast commissioning
- ✓ Error reduction
- ✓ Flexibly expandable
- ✓ No terminals
- ✓ No terminal boxes

safety system reduces the wiring effort



ENORMOUS WIRING EFFORT

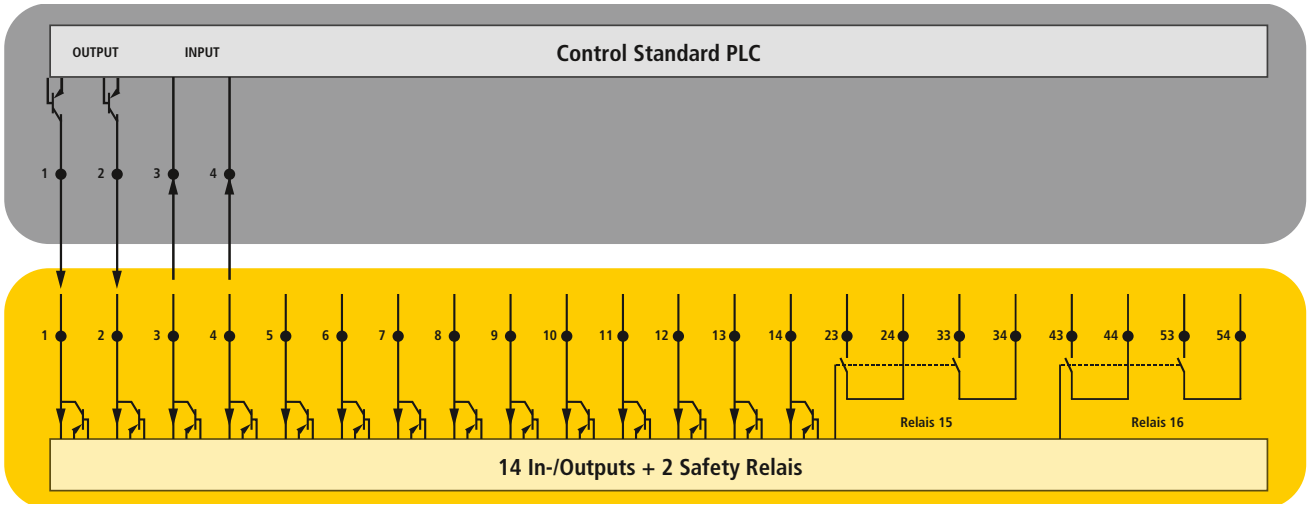
- ✗ High wiring effort
- ✗ Many modules
- ✗ Increased error rate
- ✗ Inflexible
- ✗ Extra control cabinets
- ✗ High cost expenditure
- ✗ Small applications already require up to 64 terminals

Communication

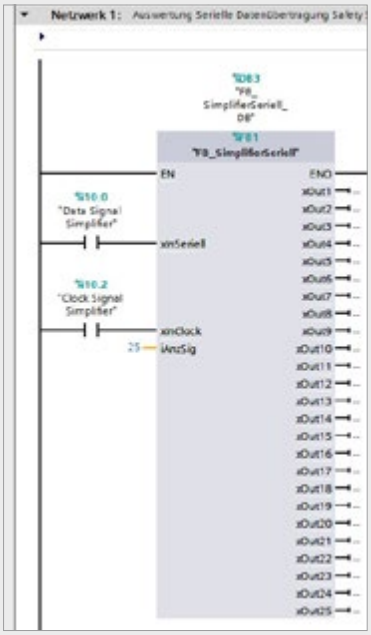
Communication with the standard PLC

Software gateway

Free of charge and in a reliable and effective way the Safety Simplifier provides bidirectionally all information to the higher-level standard PLC. If two of the 14 inputs or outputs are reprogrammed as serial outputs, the Simplifier Manager uses its standard modules. These modules send through only two outputs up to 32 pieces of information to the higher-level control unit. If these pieces of information are not sufficient, further free inputs and outputs can be used for communication without limitation. Free software gateways for Siemens, Beckhoff and other commercially available control units are available for download at **www.safety-products.de**.

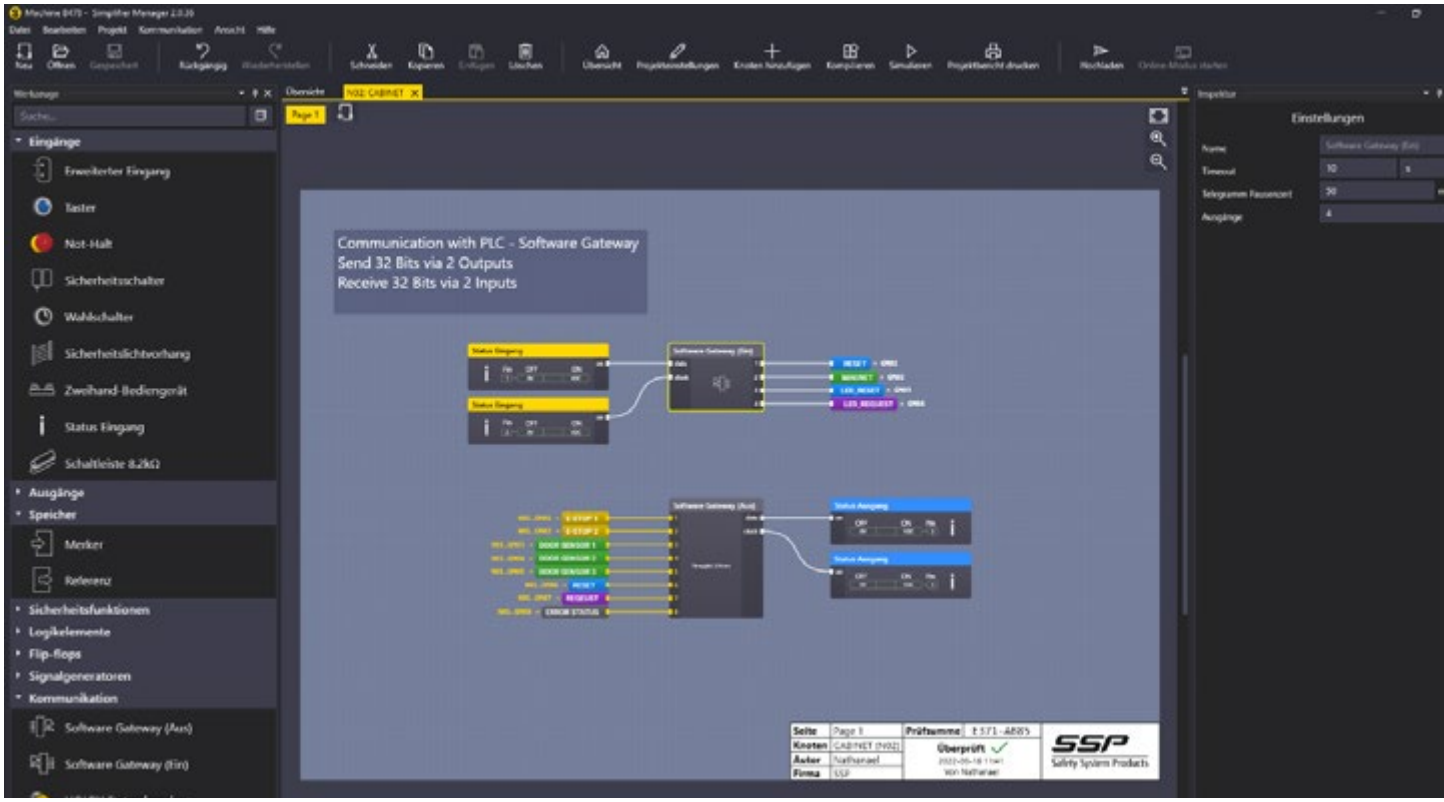


Hard-wired interface: Unsafe communication with only two inputs and outputs



Functional module for Siemens PLC

SIEMENS
ROCKWELL
BECKHOFF, B&R
CODESYS 2
CODESYS 3

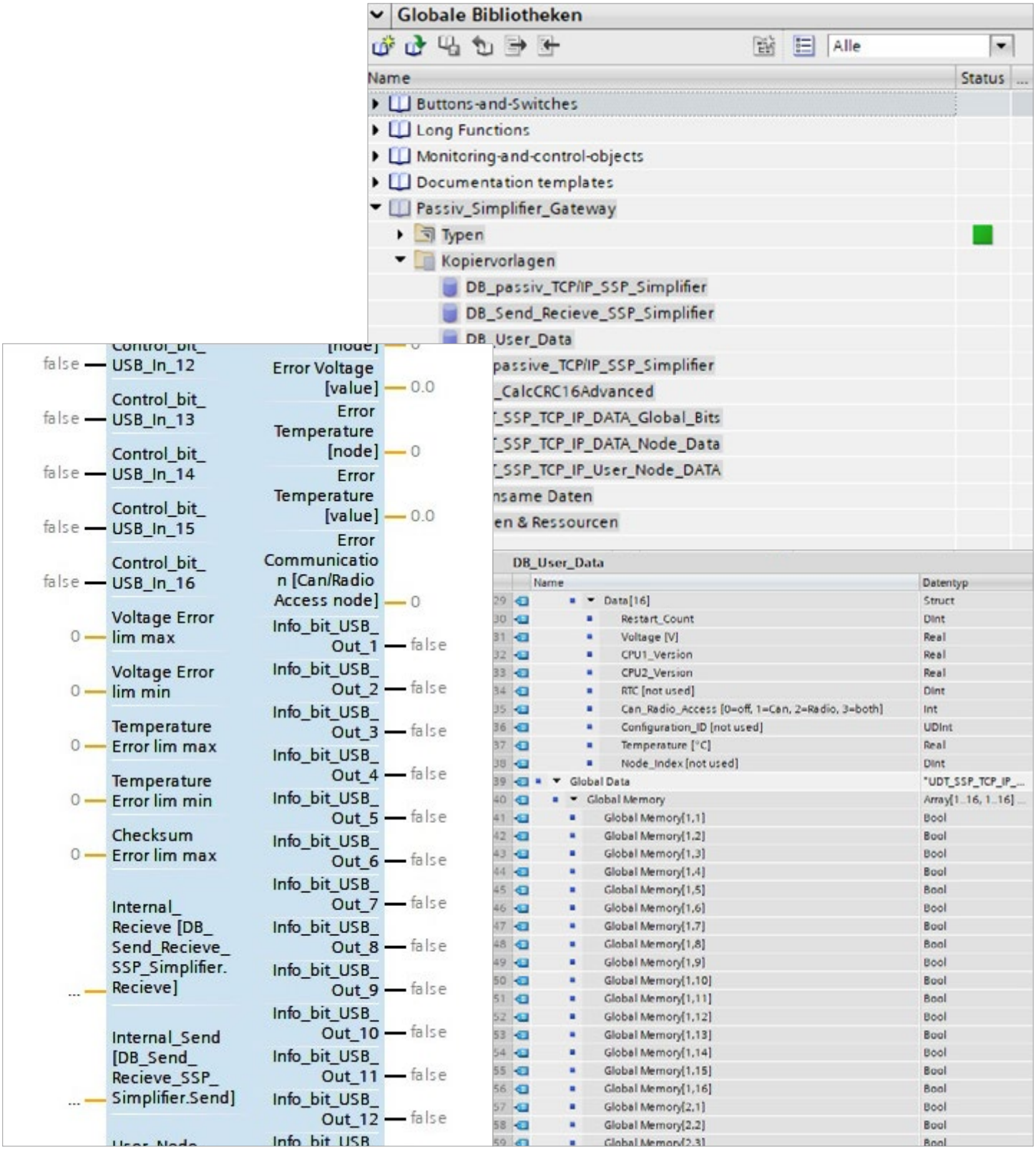


Communication with the Siemens PLC from the Simplifier Manager

Simplifier Gateway TCP/IP

HIGH PERFORMANCE
FAST
LARGE PROJECTS

The Simplifier Gateway TCP/IP offers a simple way to exchange information between the Safety Simplifier safety controller and the higher-level controller. For this purpose, a connection is established between Safety Simplifier and gateway via USB cable. The gateway converts the information and makes it available via TCP/IP. The ready-to-use program blocks on the Siemens TIA side allow easy integration of all important signals. All 256 global flags are transferred. Additionally 16 USB inputs and outputs are available for free use. The cycle time is only 100 ms.



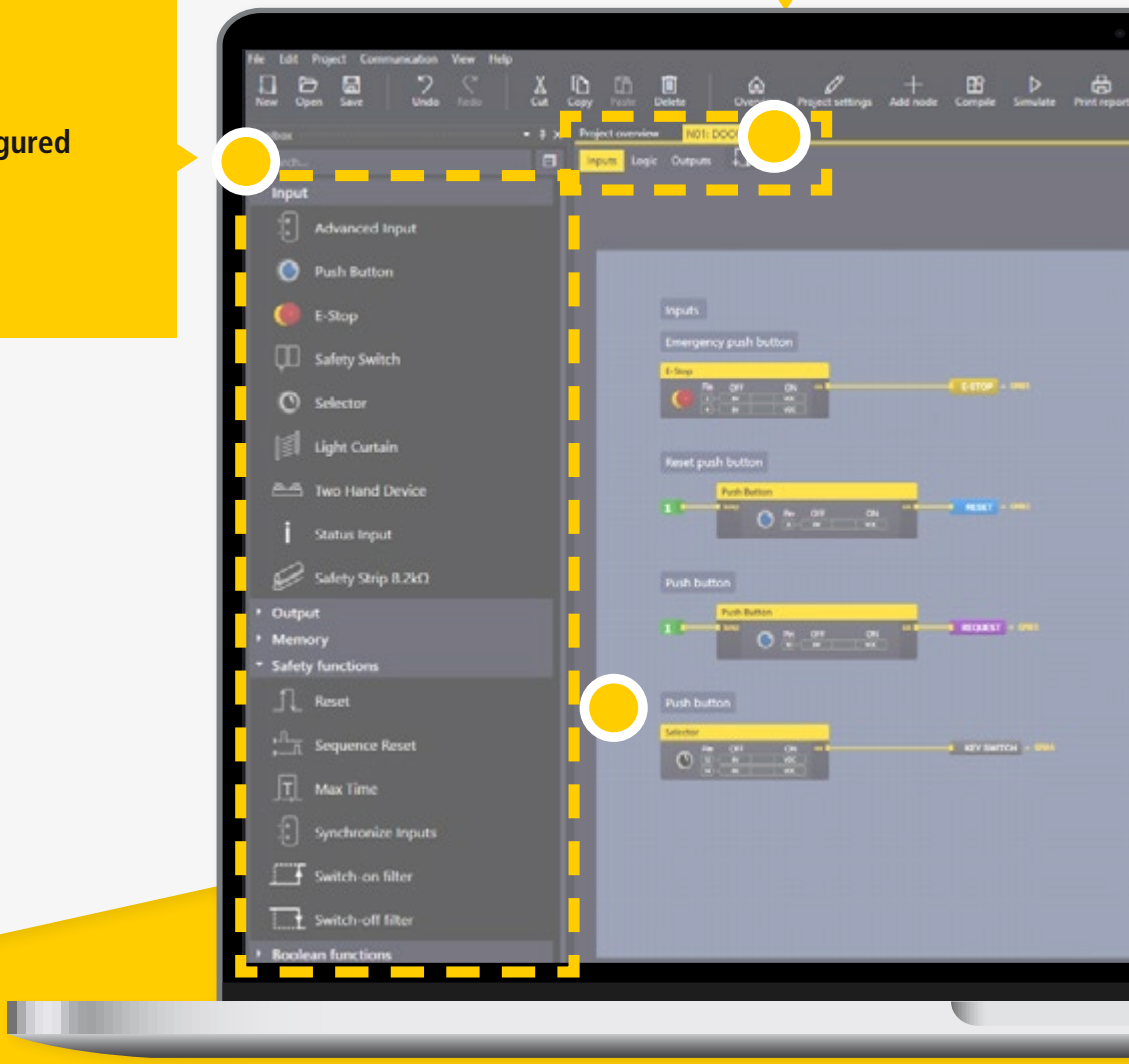
- ✓ Status diagosis diagnosis of up to 256 global information
- ✓ Function diagnostics such as voltage, firmware version and temperatures
- ✓ Bidirectional communication
- ✓ Simple commissioning thanks to ready-made function and data blocks
- ✓ Cycle times <100 ms
- ✓ Narrow design of only 22.5 mm

Simplifier Manager

Subpages

Individual arrangement of the program by any number of subpages

Pre-configured Modules



Comment function

Improvement of the application software through individual comments

Simple design of the decentralized functions

16 global flags per Safety Simplifier, up to 256 global flags in the system

Flexible Signal evaluation

Clear project structures

Checksums – CRC

Unique checksum for each subpage for convenient software validation

Software validation

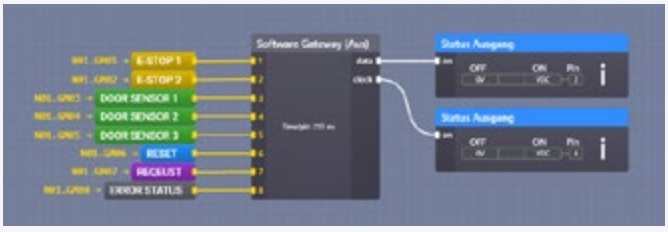
Each individual page is verifiable. When changes are made, individual pages can be validated.

Free Software

Clear program structures

Predefined logic and functional modules as well as drag & drop functions simplify programming.

Free software gateways



Functional modules for communication with the standard PLC via free software gateways.

WIRELESS

Wireless program transfer and diagnosis

Thanks to the wireless function, programming can be transferred to the Simplifier without cable restrictions and diagnosis can be performed in online mode.

Simplifier Manager

PROJECT REPORT

Import and export function of program parts

Standardization of programs with the import and export function. Simplifier standard units with ready programs and E-Plan macros.

Optimized software validation

Individual checksums for each sub-page of the application software facilitate the validation process.

Online diagnosis

Online diagnostics via the wireless safety interface. Furthermore, the program can be simulated and tested offline.

Easy diagnosis

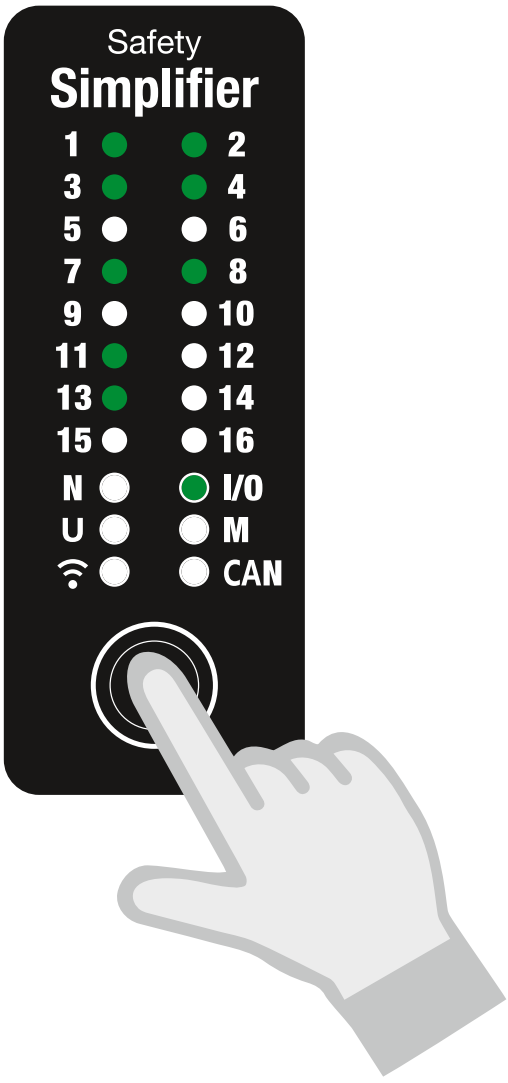
Diagnosis on the device

Simplified testing of inputs and outputs directly on the device

The display of the Safety Simplifier shows the status of the inputs and outputs via the LED colors when the integrated safety components are activated. As a result, the inputs and outputs can be checked without an additional employee.

The conditions can be evaluated directly without having to work with trained personnel at the open control cabinet.

Decentralized inputs and outputs can be checked directly on the device without a laptop and software.



Diagnosis of wireless quality and response times

The Simplifier Manager provides the possibility to check the wireless quality and the current response time in the network.

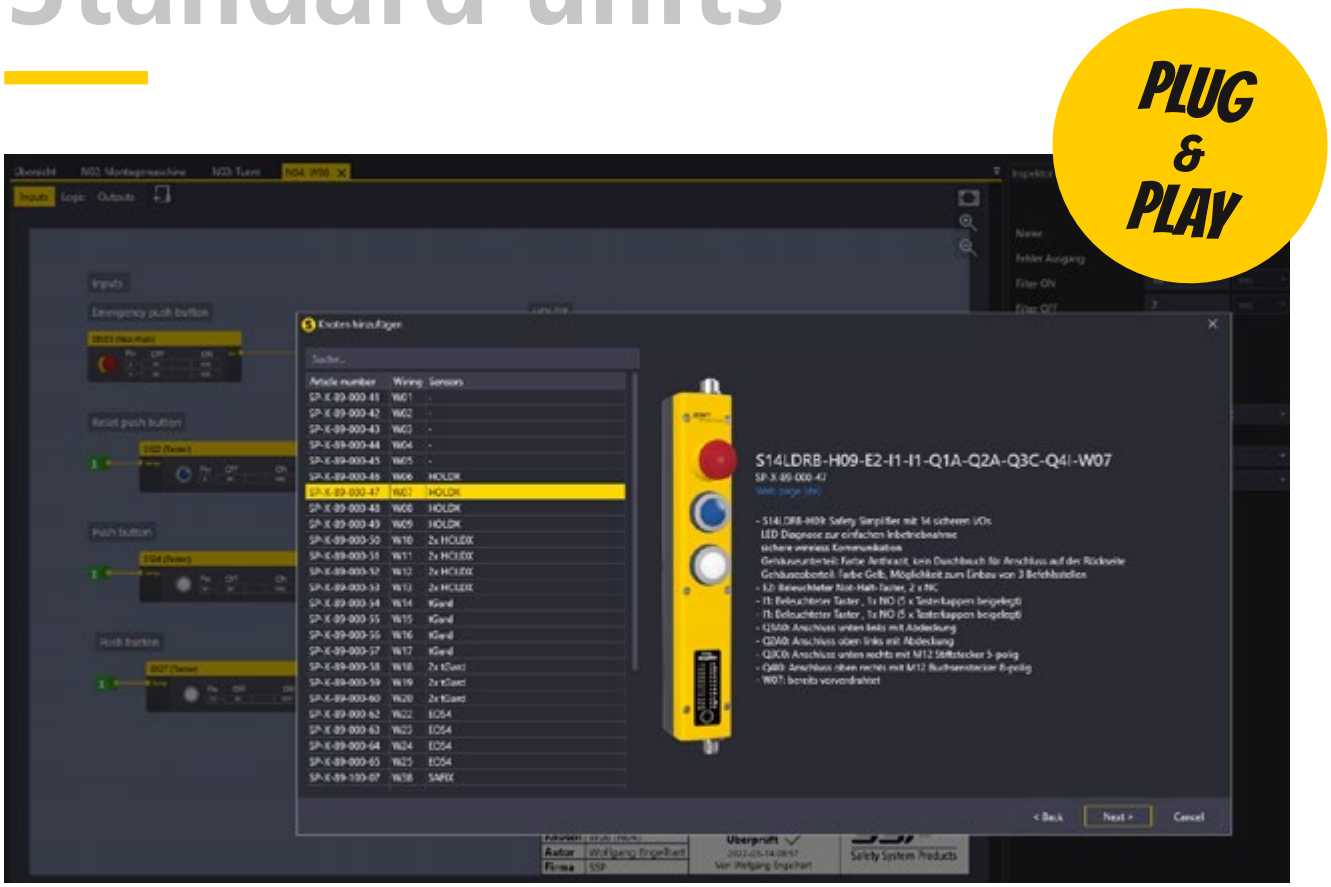
Online diagnosis

Simplifier Radio Monitor

For downloading of the application software or for diagnosis in online mode, the Safety Simplifier impresses with wireless communication, because cable length restrictions of ethernet or USB cables do not restrict the technician at his workplace.

Thanks to the wireless functionality, the Safety Simplifier can be accessed without cable limitation.

Standard units



Integrated library for standard units.

SSP offers a wide range of standard units, which are internally pre-wired and already contain the appropriate connectors for common SSP sensors (see page 15).

Simplifier Manager 2.0 provides an extensive library for this purpose, in which the predefined standard unit can be selected. The user then receives a preprogrammed routine with input and output terminals already assigned and complete EPLAN macros are available.

- ✓ EPLAN macros
- ✓ Selection of preprogrammed routines in SM 2.0
- ✓ Pre-wired
- ✓ Short delivery times
- ✓ PLug & Play
- ✓ Safety functions can be easily implemented

Application control cabinet

The safety controller that makes the makes the control cabinet smaller

The Safety Simplifier is built onto a control cabinet from the outside, regardless of whether it is a cabinet for plant safety technology or a robot control cabinet.

The connections are fed into the control cabinet via the openings on the back of the housing and wired directly there. With the help of the LED diagnostics, states can be read directly on the device without having to open the control cabinet.

The customizable 16 safe inputs and outputs provide maximum flexibility. The Safety Simplifier is ideal for small and medium sized plants. With the help of the wireless safety interface, systems can be expanded decentrally at any time.

The Safety Simplifier can also be used without wireless for small systems with few safety functions and thus serves as a standalone safety controller.

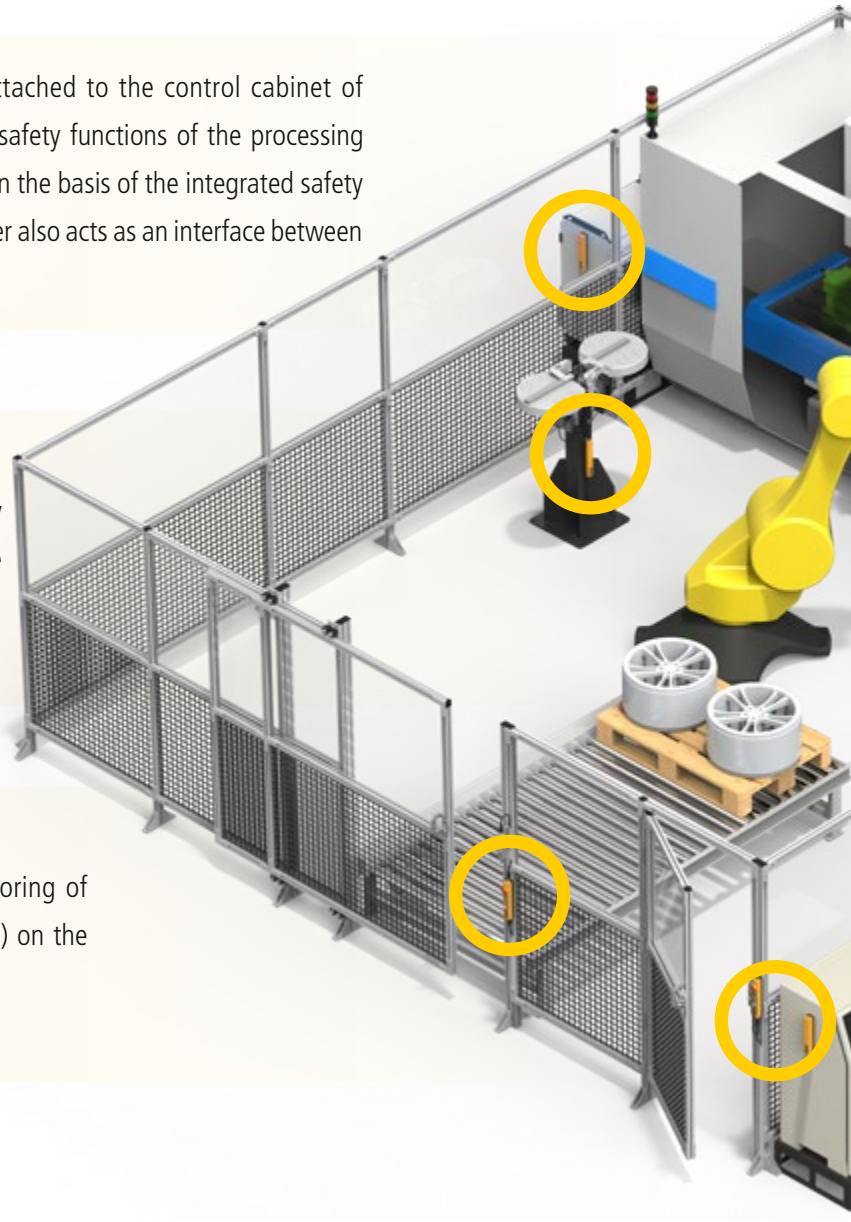
Application

Robot cell implementation with the Safety Simplifier

If the Safety Simplifier is attached to the control cabinet of the processing machine, all safety functions of the processing machine can be taken over on the basis of the integrated safety controller. The Safety Simplifier also acts as an interface between the individual components.

At the tool stand, the Safety Simplifier monitors the safe tool change of the robot.

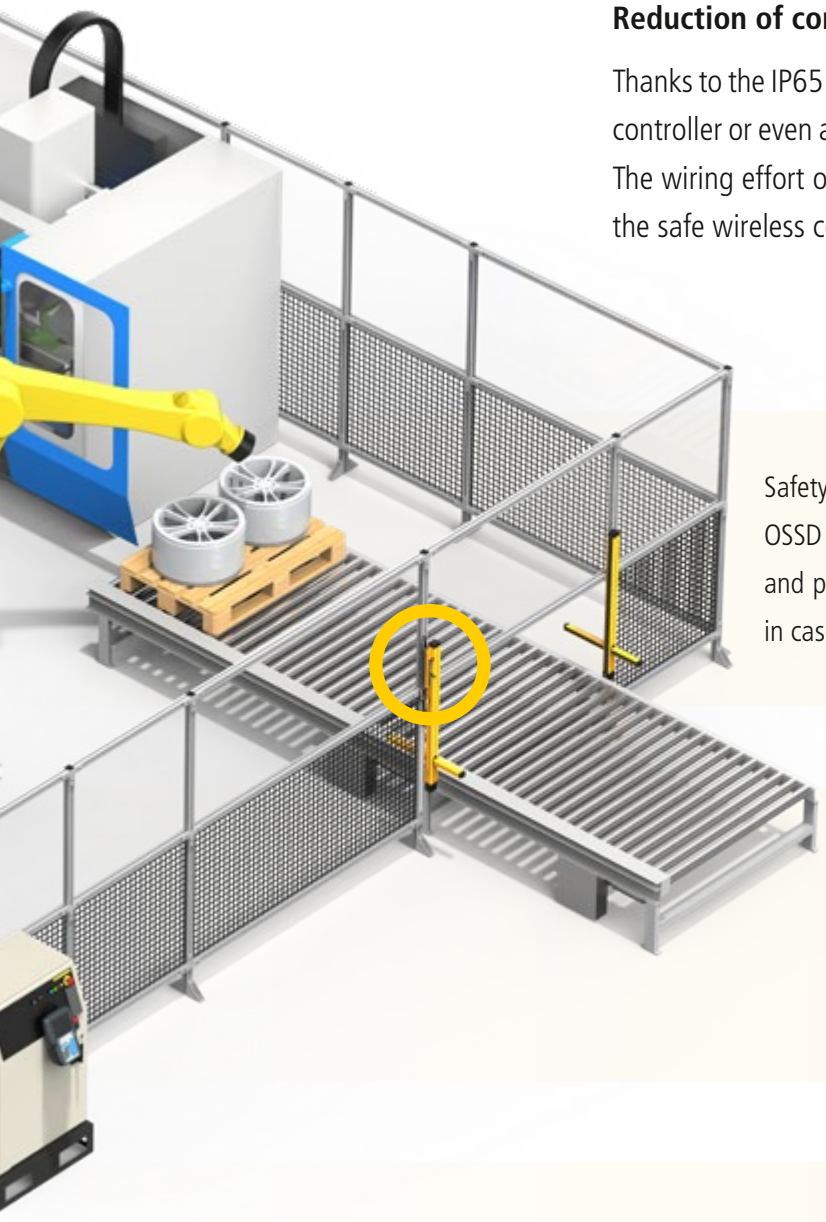
Operational unit and monitoring of the safety switch (e.g. tGard) on the sliding door.



Easy planning

Thanks to the modular design, up to 16 Safety Simplifier can be decentrally distributed on the robot cell and perform all safe and unsafe control tasks. Exactly where they are needed. If doors, robots or machines are subsequently integrated, another Safety Simplifier realizes the safety functions by integrating them into the safety circuit.

Robot automation



Reduction of commissioning time

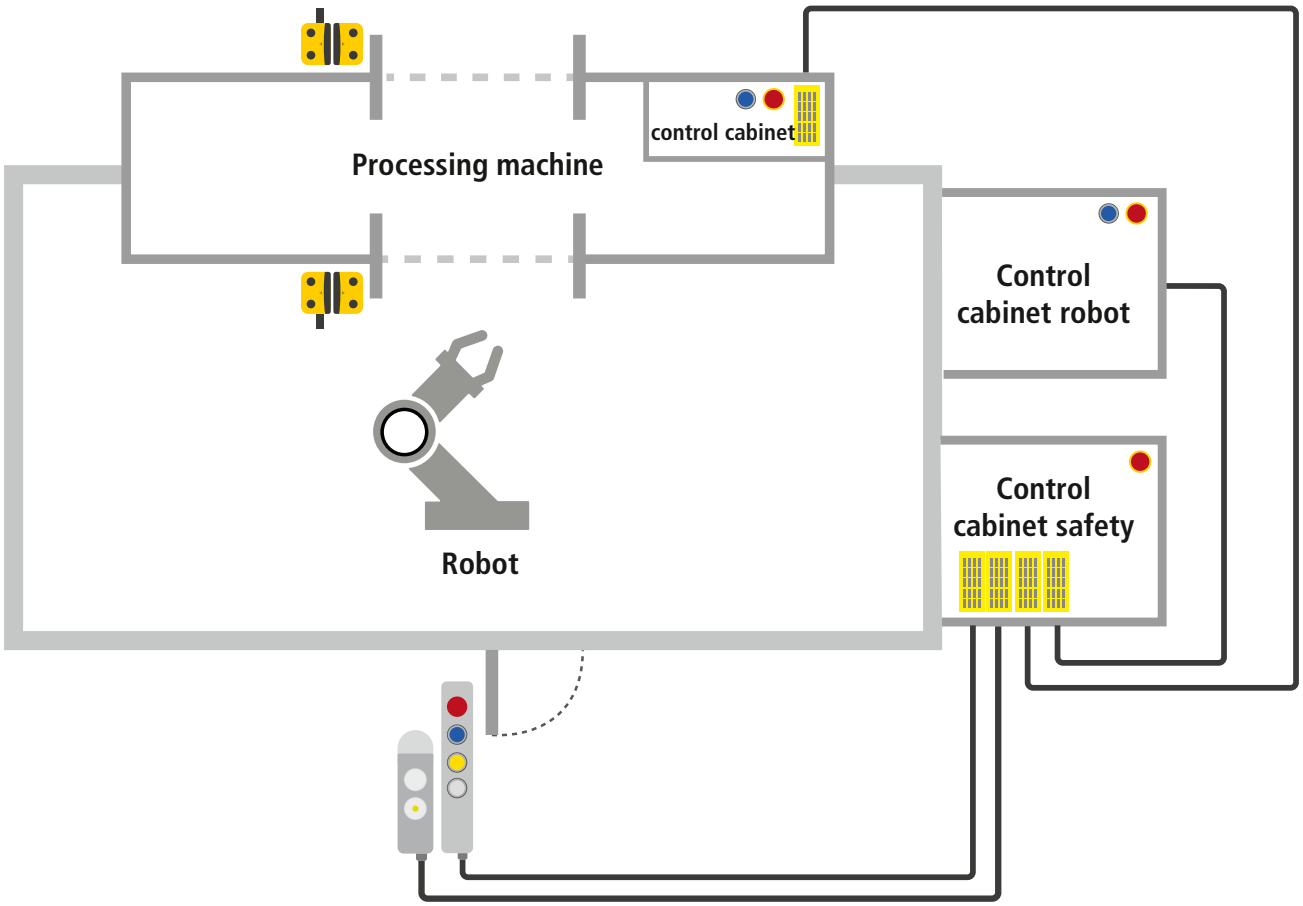
Thanks to the IP65 protection class of the Safety Simplifier, an external safety controller or even a control cabinet is not required for the safety technology. The wiring effort of the safety components is reduced to a minimum using the safe wireless communication.

Safety Simplifier evaluates the OSSD signals of the muting light grid and provides the override function in case of faults.

Safety Simplifier also acts at the control cabinet with a reliable shutdown of the robot.

Operational unit and monitoring of the safety switch on the wing door.

Simplified application example of a robot automation without Safety Simplifier



Assembly times for initial comissioning

- Creation of the EPLAN for custom machines
- ✘ Planning cable routes
- ✘ Installing cable ducts
- ✘ Laying cables
- ✘ Wiring control cabinet
- Creation of software
- Installation of the plant in the factory
- Dismantling of the plant in the factory
- Startup at the end customer

Project changes

A door is added – what now?

- Does the control cabinet need to be expanded?
- Extension of the safe I/Os necessary?
- New cabling and wiring effort?
- New software validation of the complete system, as the checksum changes?
- EPLAN adjustment effort?
- Startup time on site?

Control cabinet

1 For machine safety

Door

2 Safe inputs emergency stop door

1 Safe input reset

1 Request input

1 Plant start input

2 Safe inputs door closed and held closed

1 Diagnostic input door closed

1 Safe output for solenoid enable
(double output according to PLd)

Robot

2 Safe inputs emergency stop from robot

2 Safe relay outputs emergency stop to robot

2 Safe relay outputs door circuit to robot

1 Request input

1 Output Safe position

Processing machine

2 Safe inputs emergency stop of processing machine

2 Safe inputs door circuit of processing machine

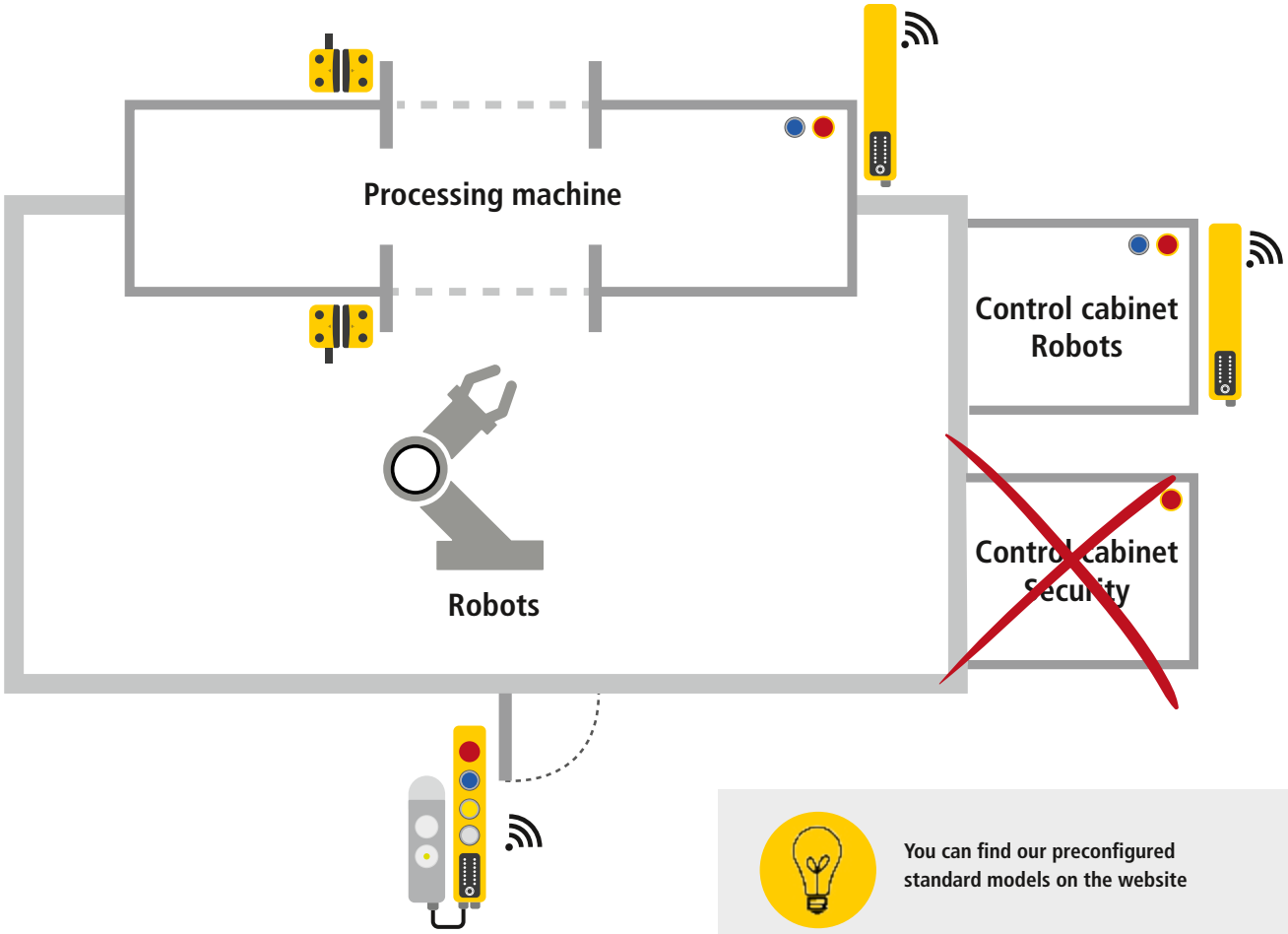
2 Safe relay outputs emergency stop on processing machine

2 Safe relay outputs door circuit on processing machine

1 Request input

1 Output safe position

Simplified application example of a robot automation with Safety Simplifier



You can find our preconfigured standard models on the website

Assembly times for initial comissioning

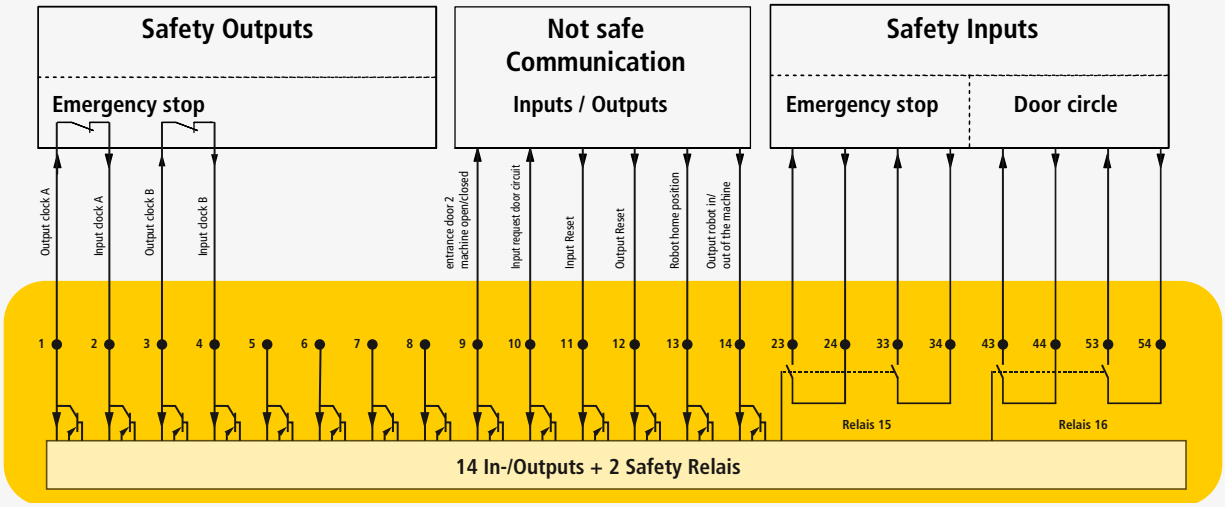
- Creation of the EPLAN for custom machines
- ✓ Fast commissioning
- ✓ No additional control cabinet necessary
- ✓ No terminals
- ✓ Reduced wiring effort
- Creation of software
- Installation of the plant in the factory
- Dismantling of the plant in the factory
- Startup at the end customer

Project changes

A door is added – what now?

- Use of Plug & Play standard units (pre-programmed, pre-wired, EPLAN macros)
- No control cabinet extension necessary
- Less cabling and no additional wiring required
- Checksum changes per page for program expansion
- Simple software validation

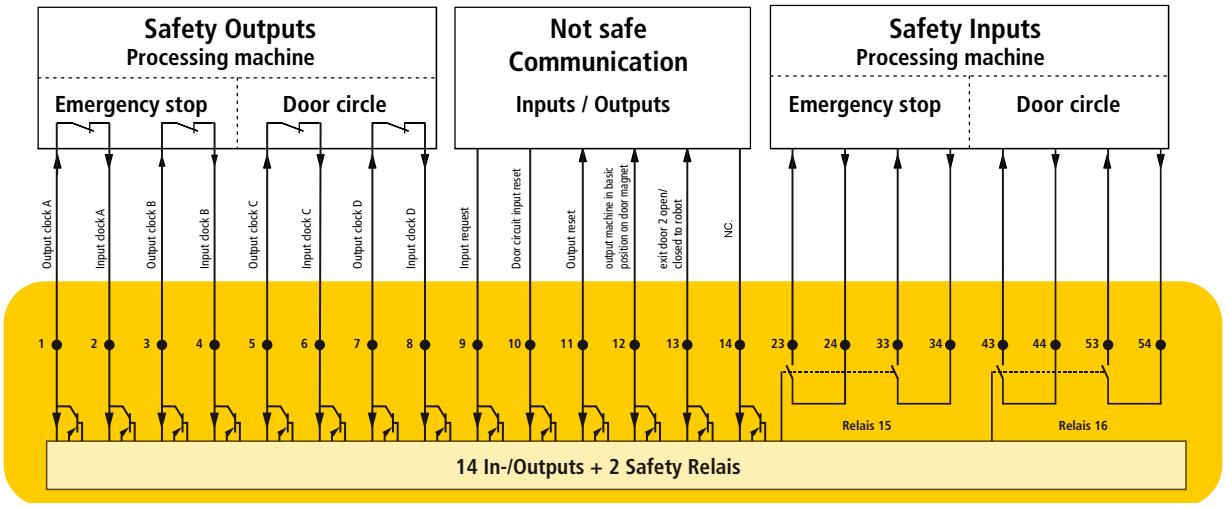
Robots



Robots

A state-of-the-art industrial robot requires the above-mentioned interfaces for the safety technology (e.g. Mosaic, safety control)

Processing machine



Machine

A processing machine that has already connected to the safety technology internally with its own safety PLC (e.g. Mosaic) usually requires the above-mentioned interfaces for external connection

Door module

A safety switch with guard locking is normally used to protect the access door of the robot cell. The tGard safety switch selected in the example can be easily connected to the Safety Simplifier via a 12-pin M12 male connector without additional wiring effort.

Safety Simplifier

Construction width

40 mm suitable for aluminum systems

Connections

Socket plug

M12 8-pin

Protection class

IP65

4 shutdown circuits

Individually evaluable safety functions

Networkable

Safe LED wireless or CAN interface

diagnosis

Extended LED diagnosis wit touch panel

Voltage supply

Male connector M12 5-pin

The Simplifier wireless distributor provides unique benefits with M12 8-pin slots and integrated safety control with wireless communication.

Up to 4 safe I/O's are available at one slot with M12 8-pin socket.

An additional safety controller or bus system is not required. Communication can be established standalone or decentralized via wireless or CAN.

Example for a solenoid interlock. Two safe OSSD outputs, an indication signal for door open/close and the safe control of the unlocking solenoid can be connected and controlled via the Simplifier distribution box.

The 8-pin slots therefore not only enable safe evaluation, but also diagnosis of the door position.

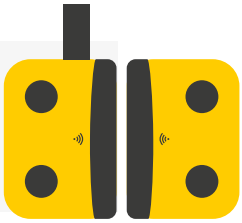
Wireless distributor

4 safe I/O's per slot

Connection options

Emergency stop button — inputs with cross-circuit monitoring

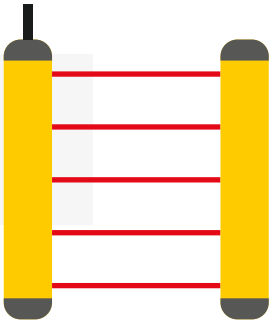
RFID safety sensor — Inputs for OSSD signals



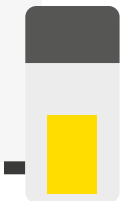
Process interlock — Inputs for OSSD signals, control of the solenoid

RFID safety interlock — Inputs for OSSD signals, control of the solenoid

Safety light curtain — Inputs for OSSD signals



Safety valves — Control and evaluation of safety valves



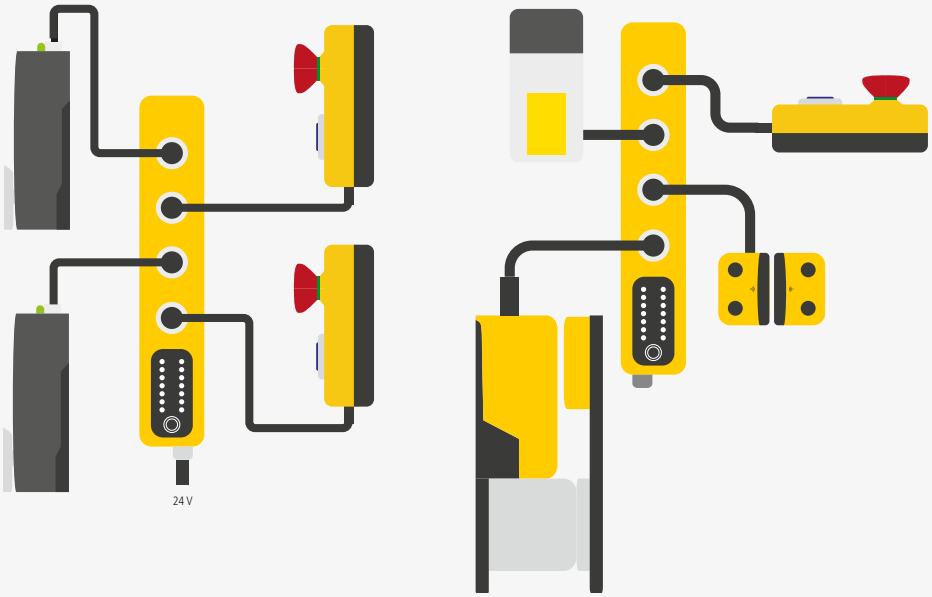
Application

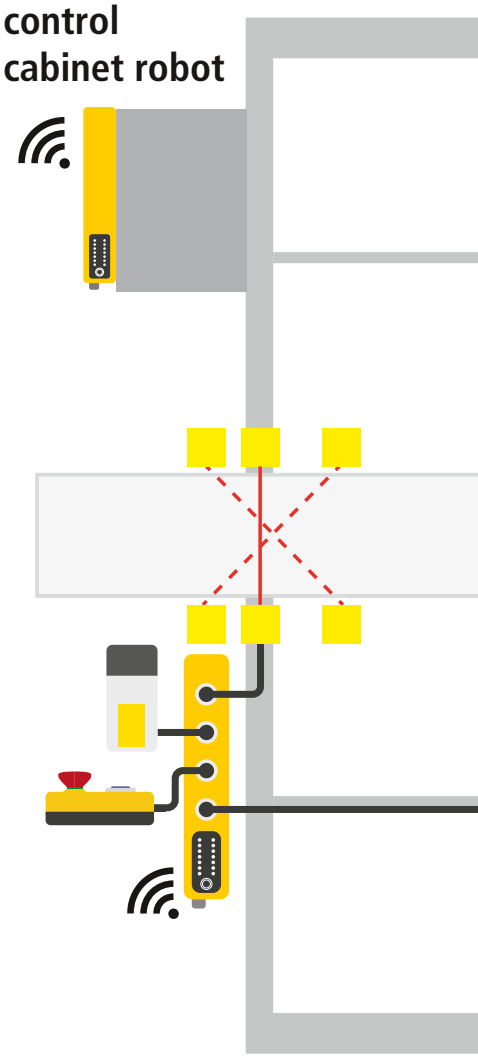
Complex plants can be easily implemented with the Safety Simplifier system with minimal wiring.

Two Safety Simplifiers with process interlocks protect access to the system.

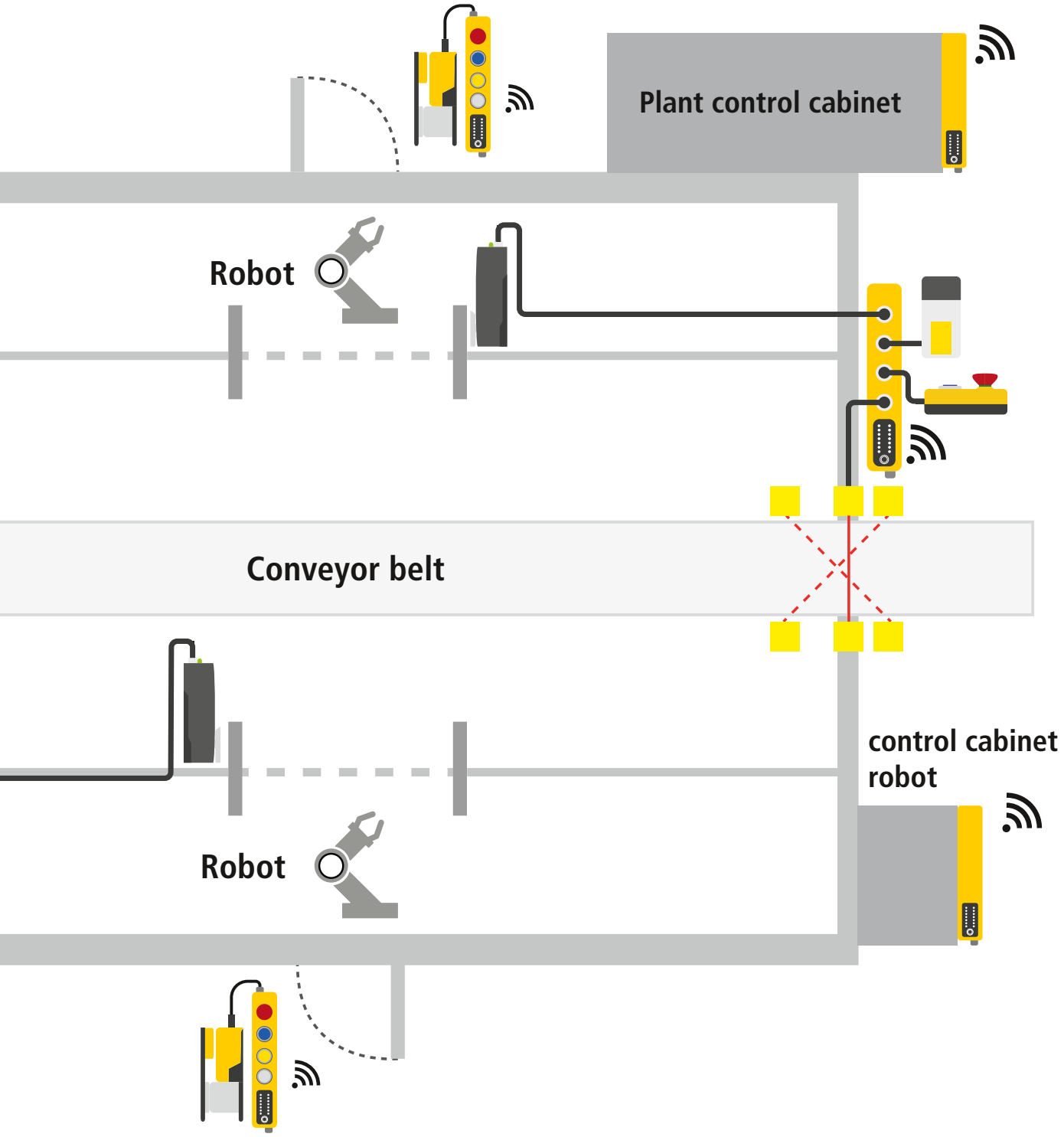
Two Simplifier wireless distributors monitor the muting light curtains, solenoid interlocks and emergency stop buttons with reset button.

One Safety Simplifier is connected to each control cabinet; communication takes place wirelessly in the mesh network.



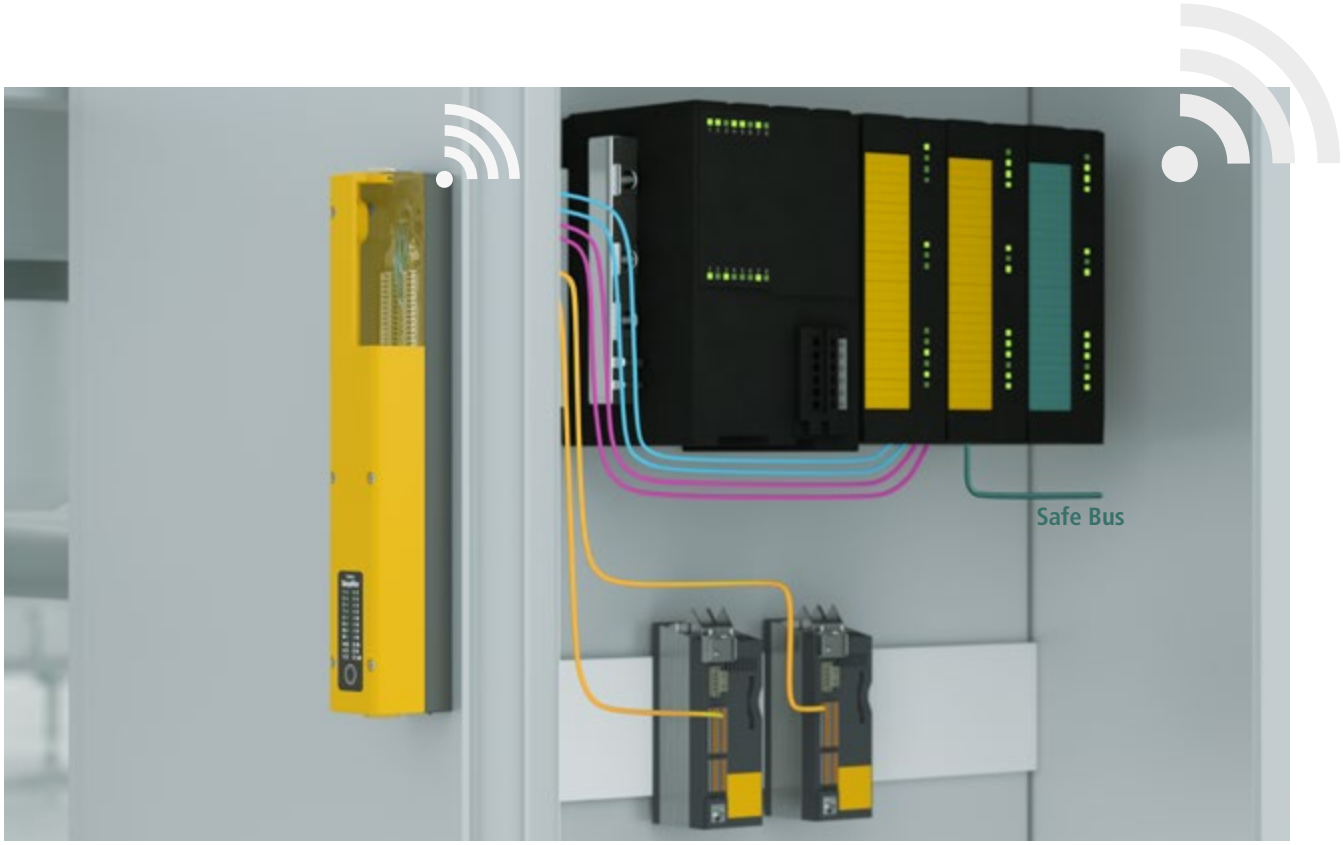


Wireless distributor concept



Safety Simplifier

Flexible, wireless extension



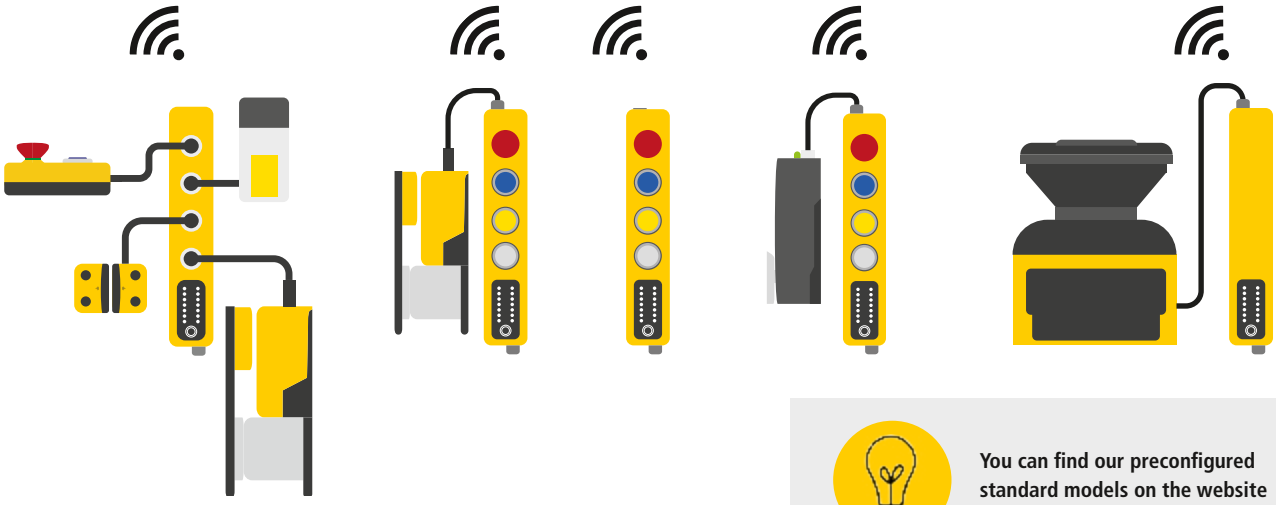
Simplified wiring example: Transfer of safe and non-safe signals from a control system with Safety Integrated.

Application description

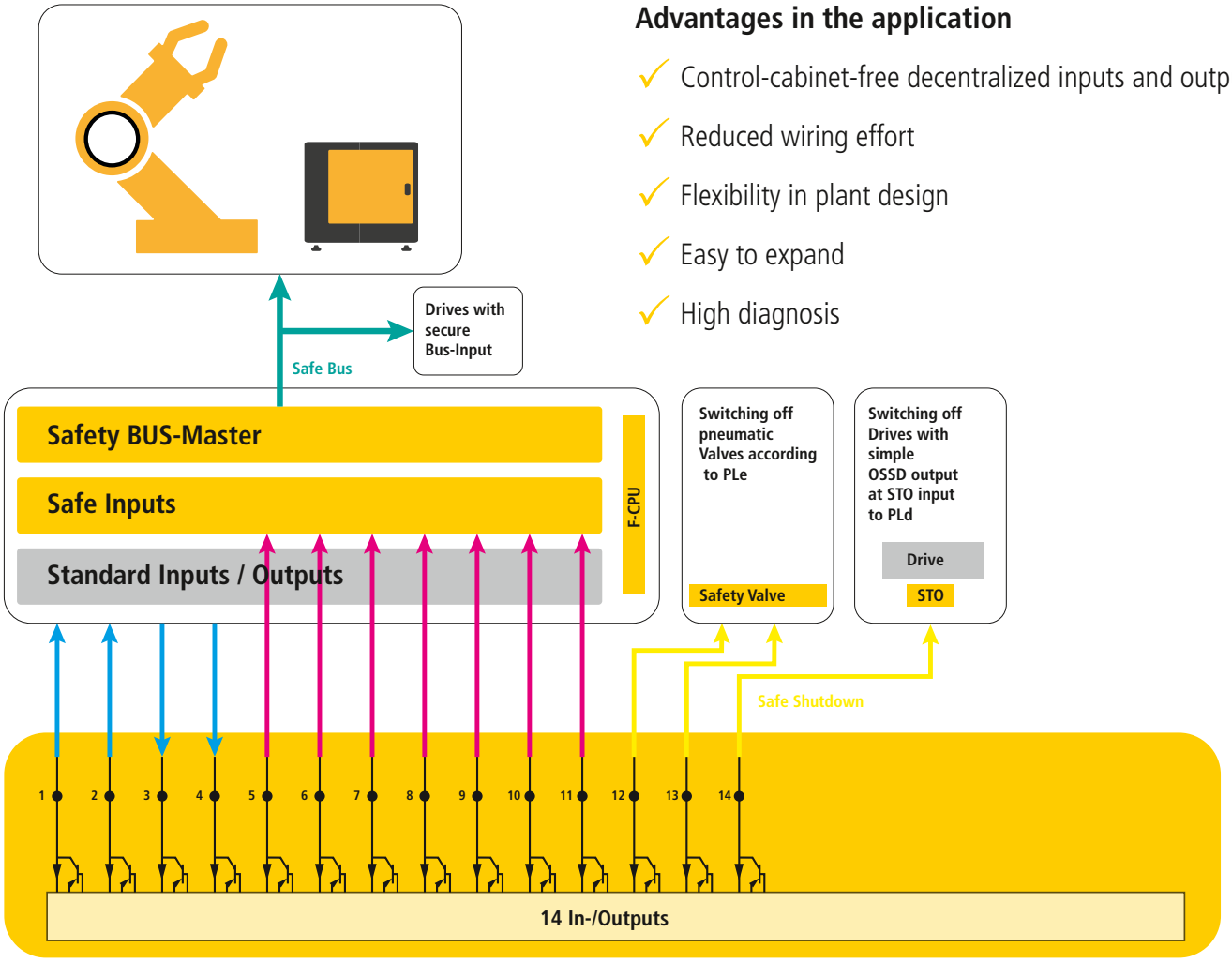
The advantage of the Safety Simplifier is that it collects and processes safe inputs and outputs and safely switches them off decentrally. Safety Simplifier flexibly collects signals from light curtains, operational units and safety switches. Simple actuators like drives can be switched off directly. Drives or robots that must be switched off via a safe BUS can be controlled via the existing Safety Integrated safety controller.

The Safety Simplifier transfers up to 14 individual safety functions according to PLd or 7 individual safety functions according to PLe to the higher-level safety controller. For a robot system usually only 2 to 4 safety functions are needed. Status information is sent to the standard PLC via two to four non-safe inputs and outputs and the free software gateway. The entire safe logic can be programmed and executed in the Safety Simplifier. The safety program in the Safety Integrated control is reduced to a minimum.

with Safety Integrated



You can find our preconfigured standard models on the website



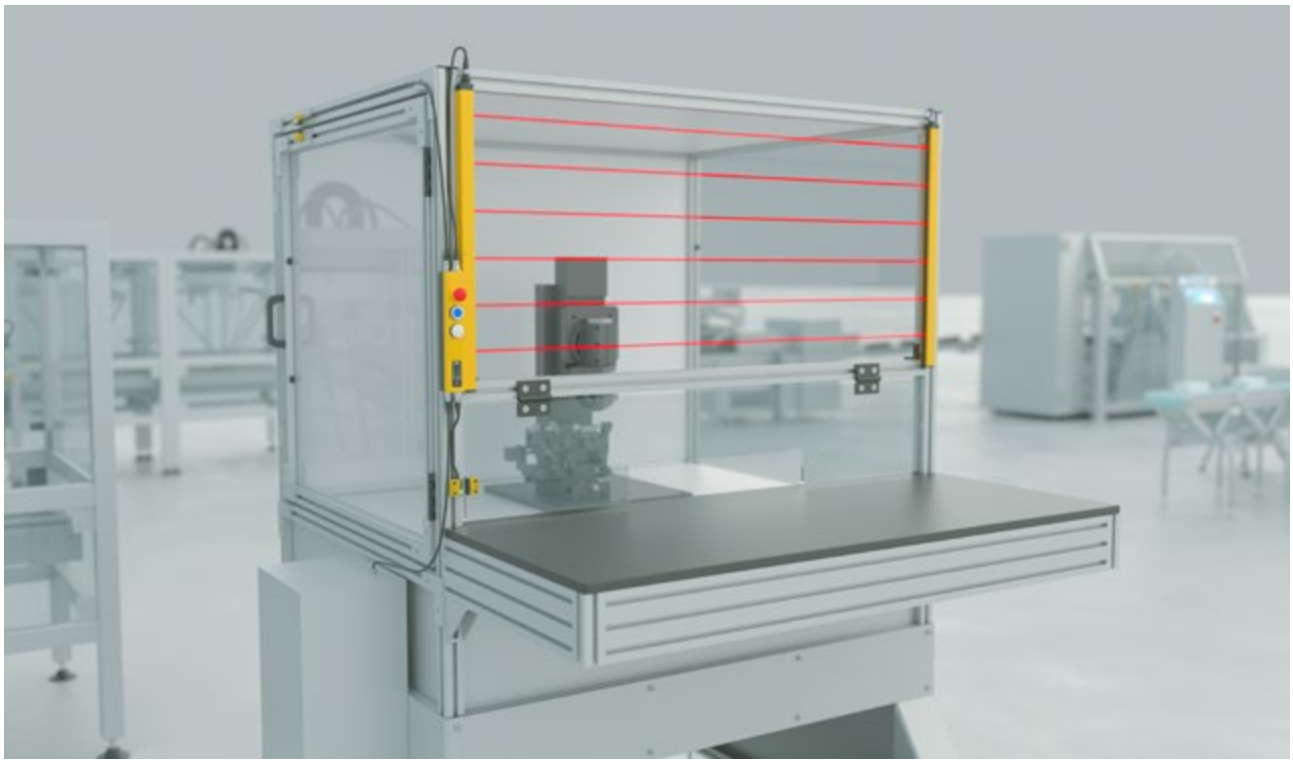
Advantages in the application

- ✓ Control-cabinet-free decentralized inputs and outputs
- ✓ Reduced wiring effort
- ✓ Flexibility in plant design
- ✓ Easy to expand
- ✓ High diagnosis

we simplify safety

Application

Safety control and operational unit in one system with Safety Simplifier



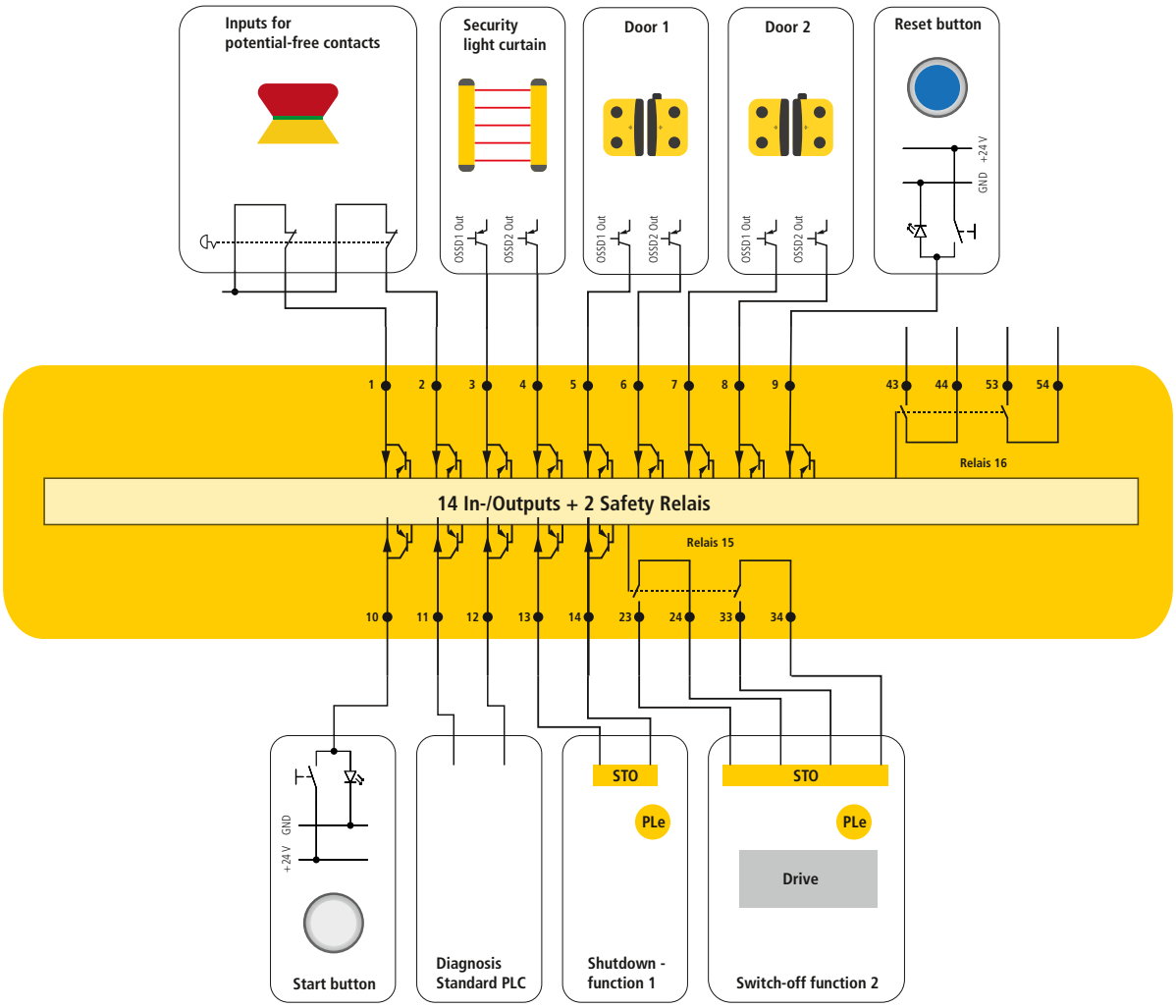
Safety controller directly integrated in the operational unit, without additional safety controller in the control cabinet

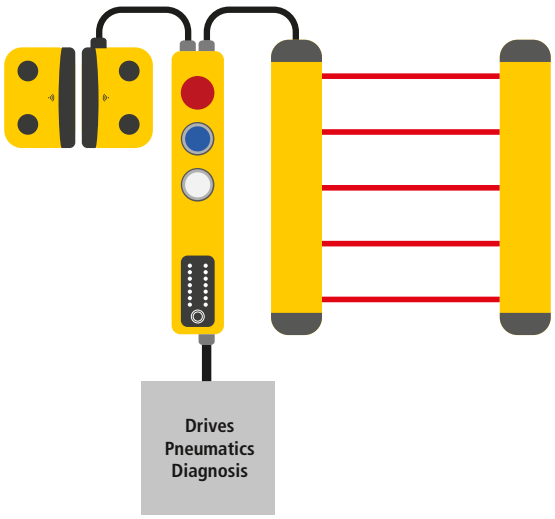
Application description

A safety light curtain with finger protection is used for the safety of the manual workstation for cyclical intervention. Two SAFIX W3 RFID sensors secure the service doors and flaps. An emergency stop button integrated in the Safety Simplifier serves the extended safety technology to switch off the system in an emergency.

Safe drives with a STO input to PLe are safely controlled by potential-free relay outputs of the Safety Simplifier in two channels. A safe, pneumatic service unit is controlled via the safe OSSD outputs of the Safety Simplifier. The free software gateway sends all status information to the higher-level, non-secure control unit. A safety controller or safety relays in the control cabinet are not required. The Safety Simplifier is equipped with M12 connectors and allows installation in the shortest possible time.

Standalone application





Advantages in the application

- ✓ No control cabinet for safety technology
- ✓ Reduction of commissioning time due to M12 connector
- ✓ Compact design in 40 mm for mounting on aluminum profiles
- ✓ No further safety controller/relay necessary
- ✓ Diagnosis via touch display on the Safety Simplifier

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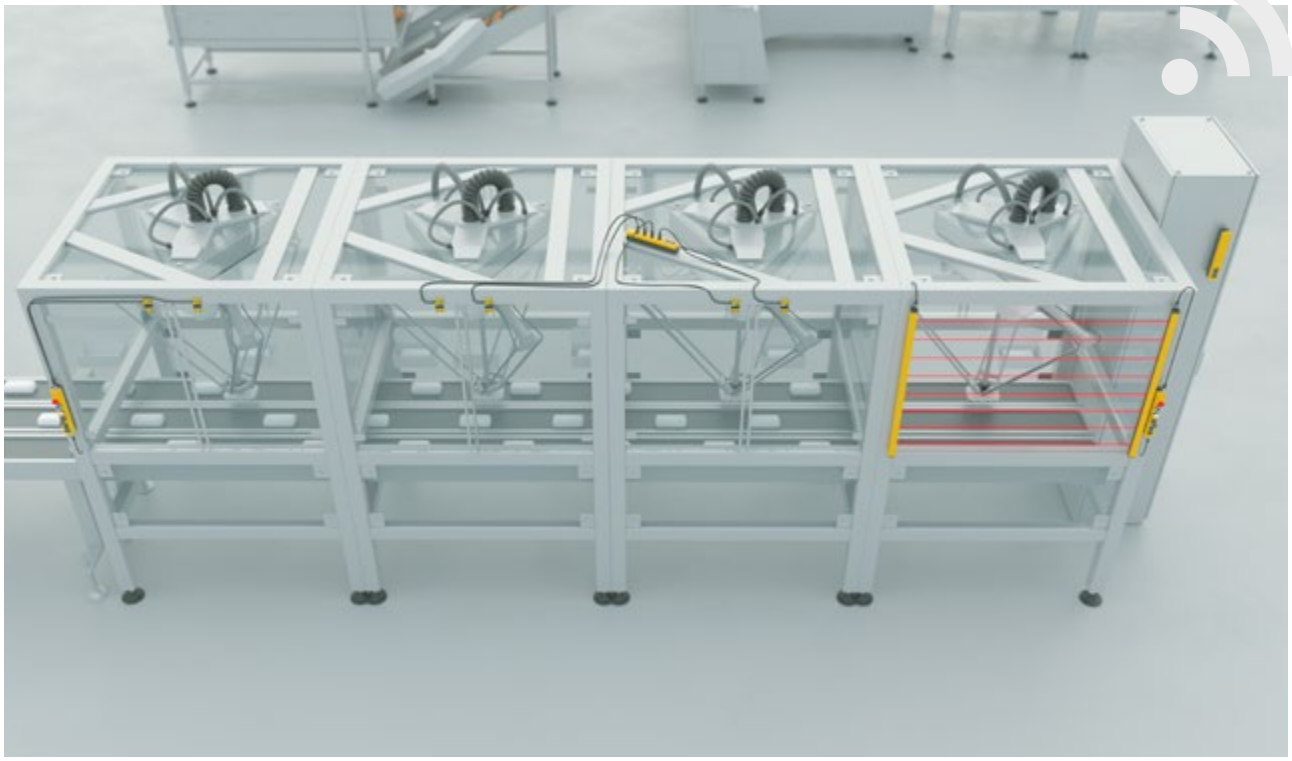
Application

Decentralized design for assembly plants with Safety Simplifier



Implementation of safety technology with wireless safety on an assembly plant.

Application description

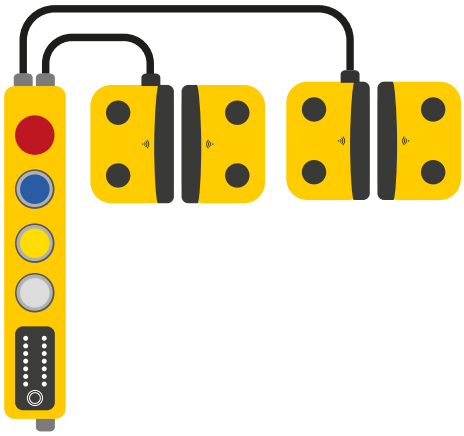
In the application shown, six non-contact RFID sensors (SAFIX W3) secure an assembly line. A safety light curtain with finger protection is provided for cyclical intervention. Two emergency stop buttons are built in for the extended safety technology. Four Safety Simplifiers with different functions, such as operating elements and distributors, evaluate the safety components and switch off the drives safely in the control cabinet. The requirement of the application is to reduce the wiring effort and to guarantee a flexible extension of the safety technology.

Since a control cabinet of an assembly plant cannot always be installed directly next to the plant, a secure wireless interface was used to reduce the wiring effort and thus the commissioning time!

You can find our preconfigured standard models on the website

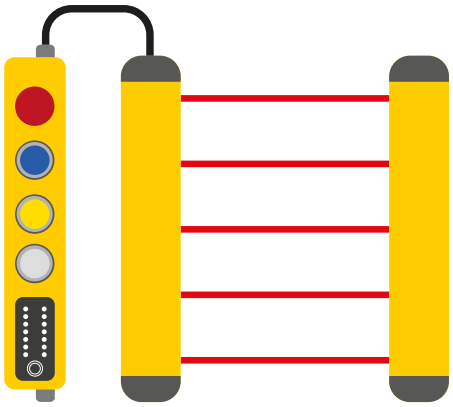
Decentralized design

Decentralized IP65 I/O modules with operational units

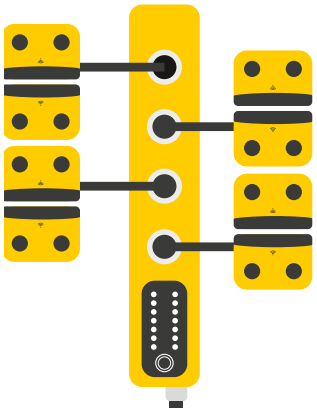


Safe switching on and off of the drives in the control cabinet

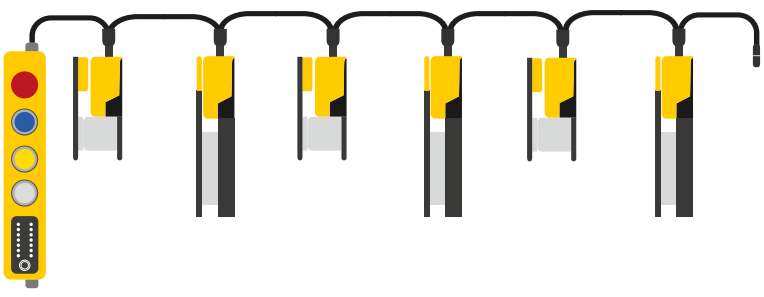
Decentralized IP65 I/O modules with light curtain



Decentralized IP65 distributors



Decentralized IP65 I/O modules with HOLDX R2



Applikation

Einsatz von EUROMAP-Schnittstellen an Spritzgussmaschinen

Safety Simplifier with Euromap interface on an injection molding machine.

Injection molding machines have high safety requirements. The use of EUROMAP interfaces makes it easier for integrators and operators to implement safety requirements for applications that are not very complex. However, for many safety applications, users quickly reach their limits with the existing interfaces and require additional safety controllers. This leads to more wiring effort and higher costs.

With the Safety Simplifier, SSP offers a simplified plug & play safety solution with integrated EUROMAP 67, 73 or 78 interface. The Safety Simplifier significantly simplifies the integration and expansion of the safety concept. These communicate securely via wireless or CAN communication (PLe) and safety switches only need to be connected. This can significantly reduce the planning and wiring effort.

EUROMAP 73/78

EUROMAP 73

The extended version of the Safety Simplifier in the double housing with connected Harting connector includes the safe and non-safe communication of external safety components for safeguarding the injection molding machine via the standardized EUROMAP 73 interface.

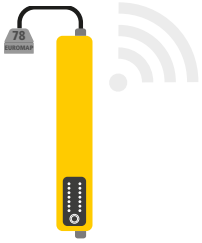
Using just one interface on the injection molding machine, up to 15 additional Safety Simplifiers can evaluate safety functions such as doors, safety mats, laser scanners and shut down the injection molding machine.

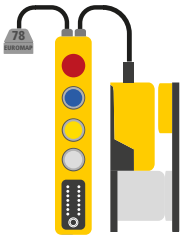
The complex shutdown with 3 double relay outputs, which simulate 3 safety switches on a safety door, are already integrated in the Safety Simplifier.

You can find our preconfigured standard models on the website

EUROMAP 78

Standalone or chained

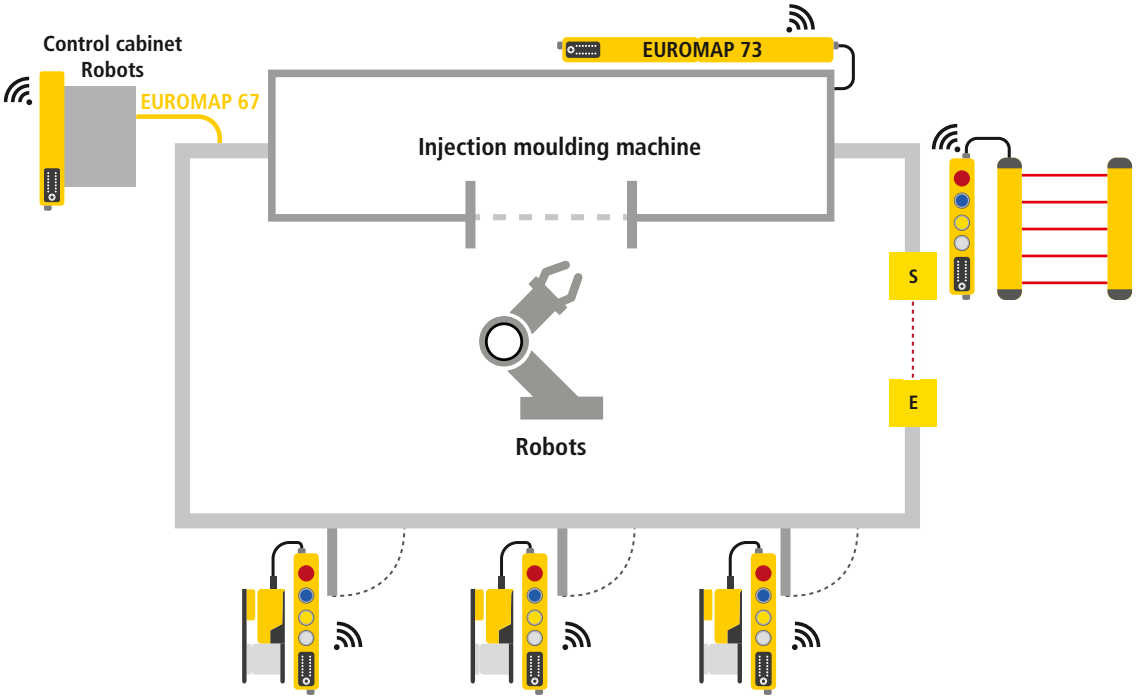




- Safety outputs are only switched on after the safety switches have been acknowledged
- Connection of up to 15 doors to one EUROMAP interface
- Wireless communication for fast, wiring-reduced commissioning
- No need to use additional safety controls
- Emergency stop functions can switch off further peripheral systems via the wireless interface
- Problem-free expansion of the plant through additional safety doors within the shortest possible time

Application

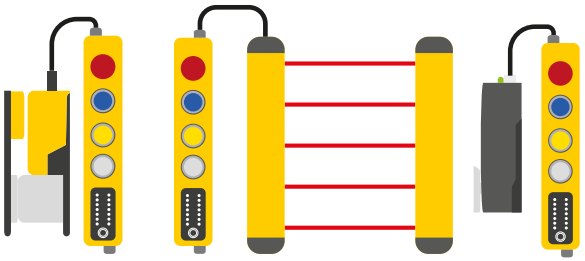
Automated injection molding system with industrial robot



Example of an injection molding machine with Safety Simplifier EUROMAP 73/78 interface

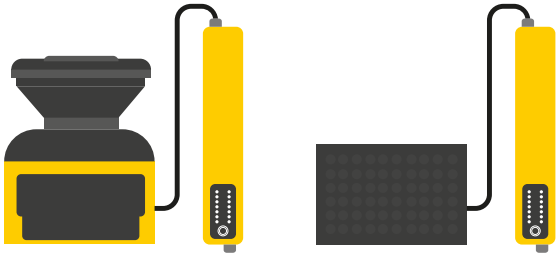
Safety Simplifier EUROMAP 73/78 interface and safety controller

The Safety Simplifier with **EUROMAP 73** or **EUROMAP 78** connects all safety devices to the injection molding machine via an interface connector.



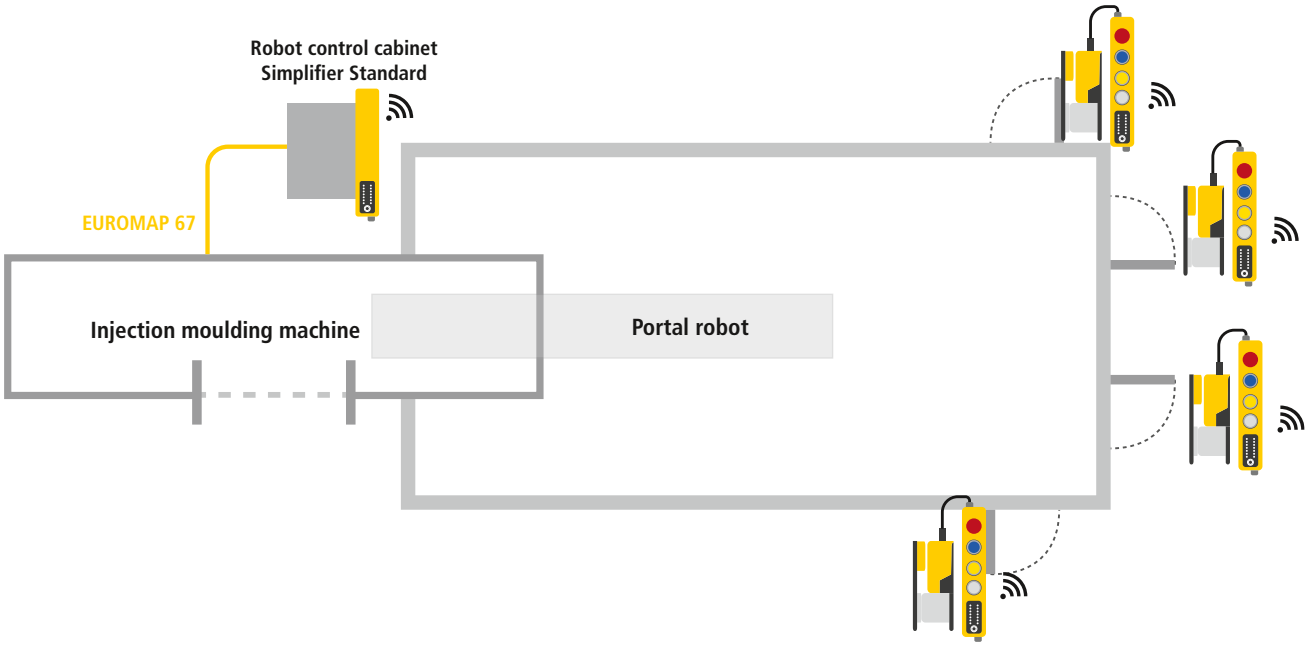
Safety devices can be freely combined

Regardless of whether a safety guard locking, a process lock or a safety light grid with muting is required for the safe automation of your injection molding machine. All units can be connected to the Safety Simplifier via M12 connector.



Injection molding machines

Automated injection molding machine with portal robot



Example of an injection molding plant with Safety Simplifier

NO FURTHER SAFETY TECHNOLOGY NEEDED

Advantages in the application

- ✓ Flexible shutdown of the injection molding machine via EUROMAP 73/78
- ✓ Standardized door system
- ✓ Simple planning and expansion of safety technology
- ✓ Safe and easy integration of robots
- ✓ Simple networking of injection molding machines with other system components
- ✓ Safety engineering without control cabinet
- ✓ No further safety controller or relay necessary

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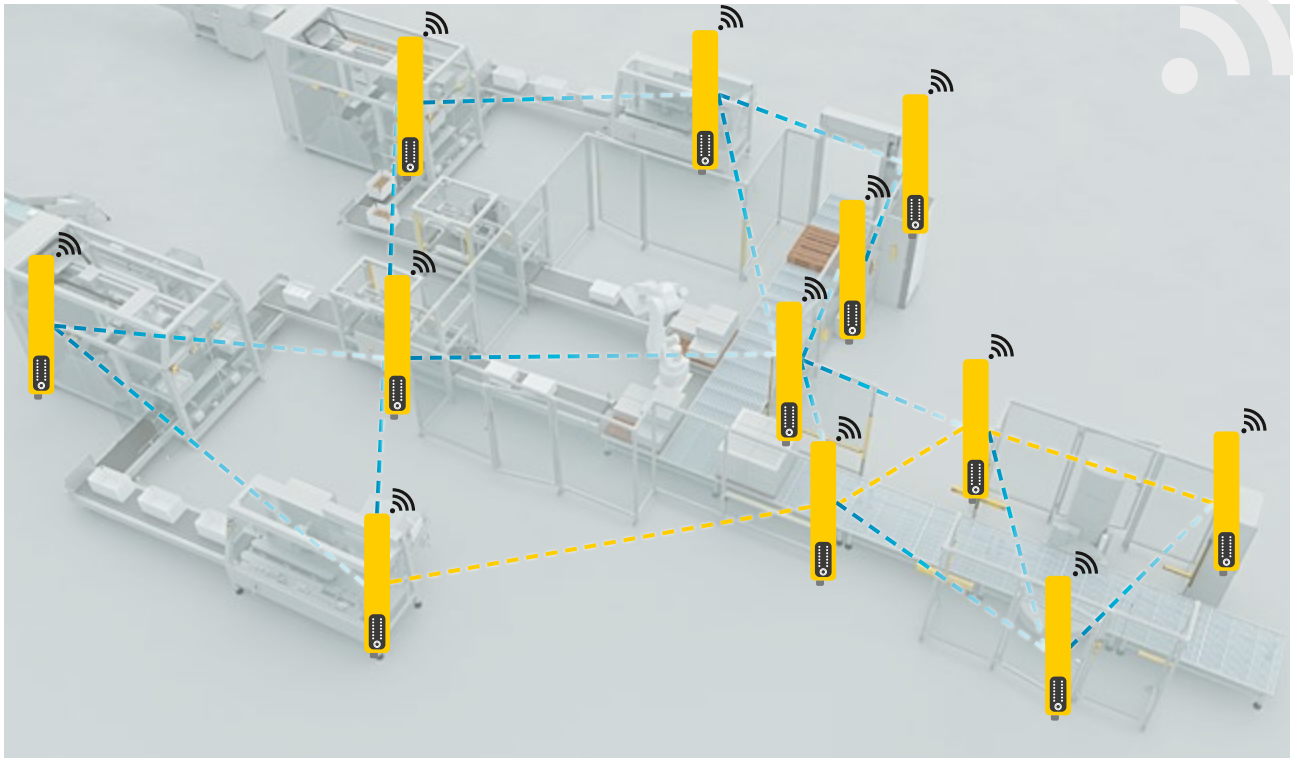
Application

Safe networking of machines



Networking of up to 16 machines via Wireless Safety.

Application description

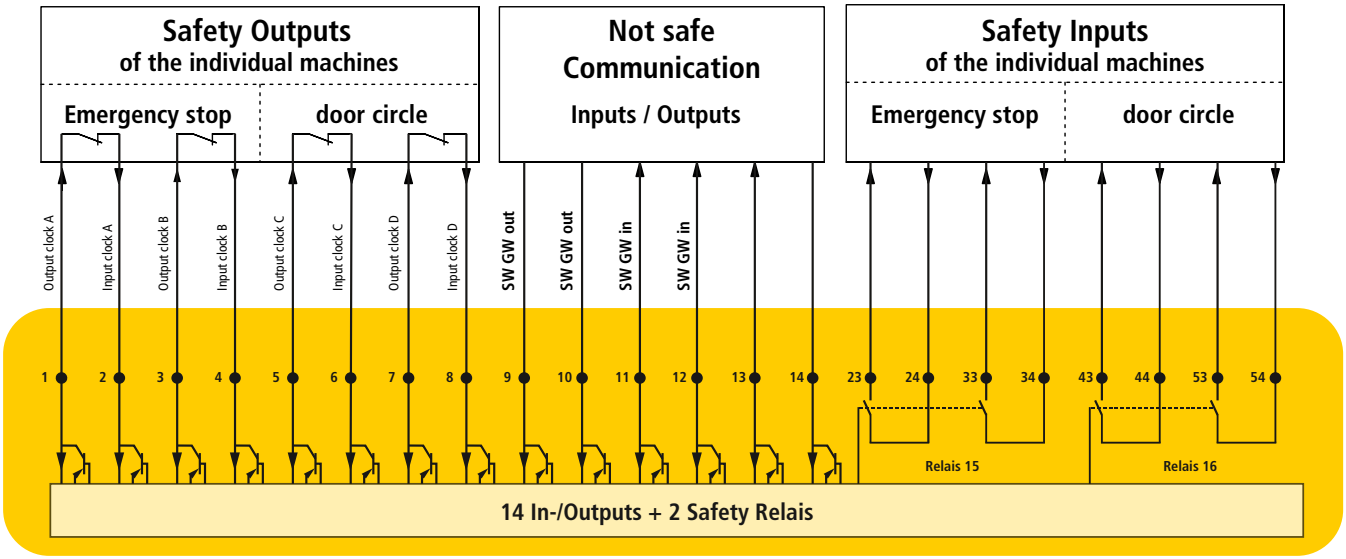
In large industrial plants it is often necessary to link the safety signals of a plant. To achieve this, potential-free contacts are wired from machine to machine or to a higher-level safety controller. Subsequent changes in the safety concept are therefore often difficult to implement. Long lines and cable routing make the safety concept inflexible and expensive. With the Safety Simplifier, a safety concept becomes attractive and can be implemented quickly. A Safety Simplifier is mounted on each machine. This either monitors the safety technology of the plant completely or only takes over the function of the safe linking of the plant, if another safety technology is already installed. Up to 256 safe signals can be exchanged via the safe wireless or CAN interface.

Machine networking

Advantages in the application

- ✓ Safe and unsafe wireless linking of machines
- ✓ Range of up to 100 m between the individual systems
- ✓ Built-in, free software gateway can communicate with different controllers (non-secure, flexible communication)
- ✓ Easy planning and extension of higher-level safety concepts
- ✓ Easy diagnosis

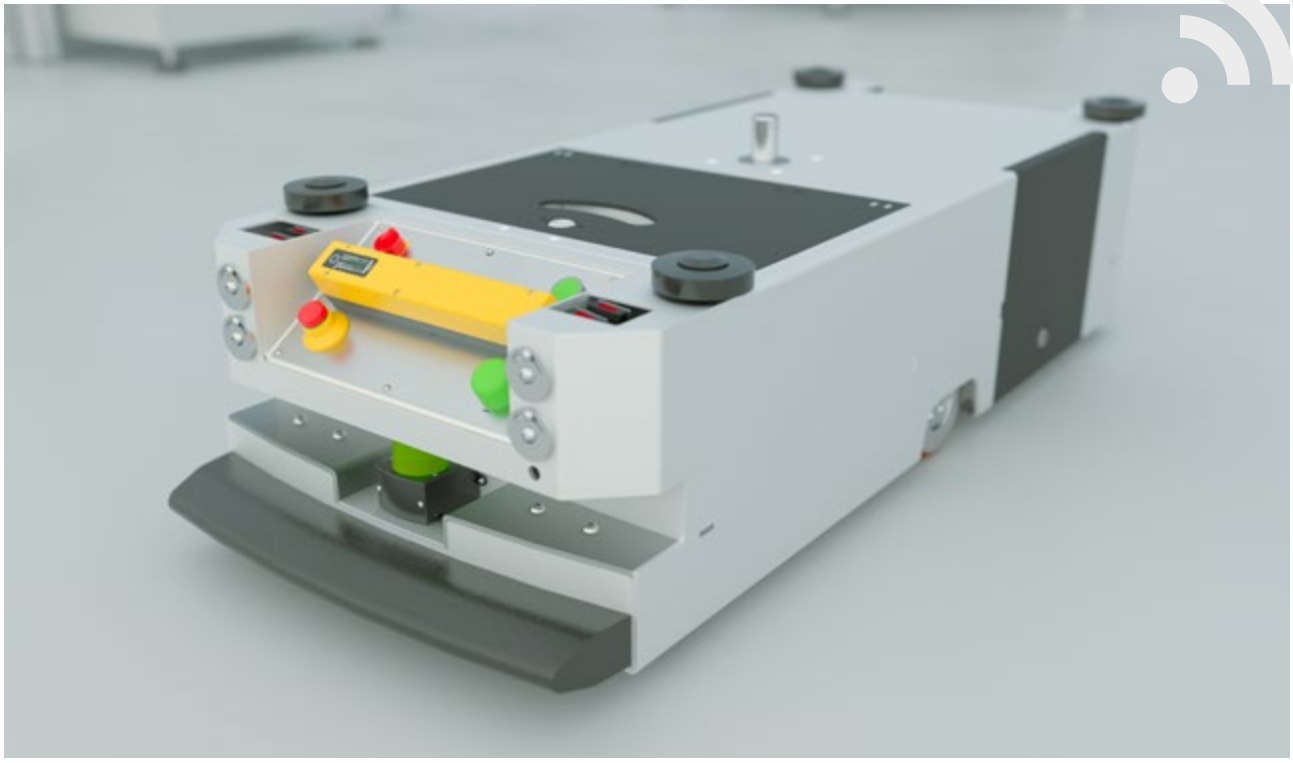
You can find our preconfigured standard models on the website



The Safety Simplifier on a single machine, mounted on the control cabinet, handles safe but also non-safe communication for the linking of the plant.

Application

Switch off AGV vehicles safely



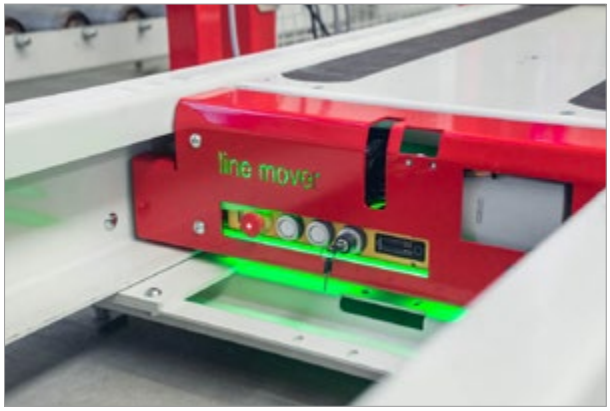
Networking of up to 250 automated guided vehicles via Wireless Safety.

Application description

Automated guided vehicles (AGVs) are the innovative answer for automated material and goods flow in companies or in intralogistics. They logistically connect individual processing machines, automated cells or even manual workstations. However, with the increasing number of AGVs, new demands are also being placed on safety technology.

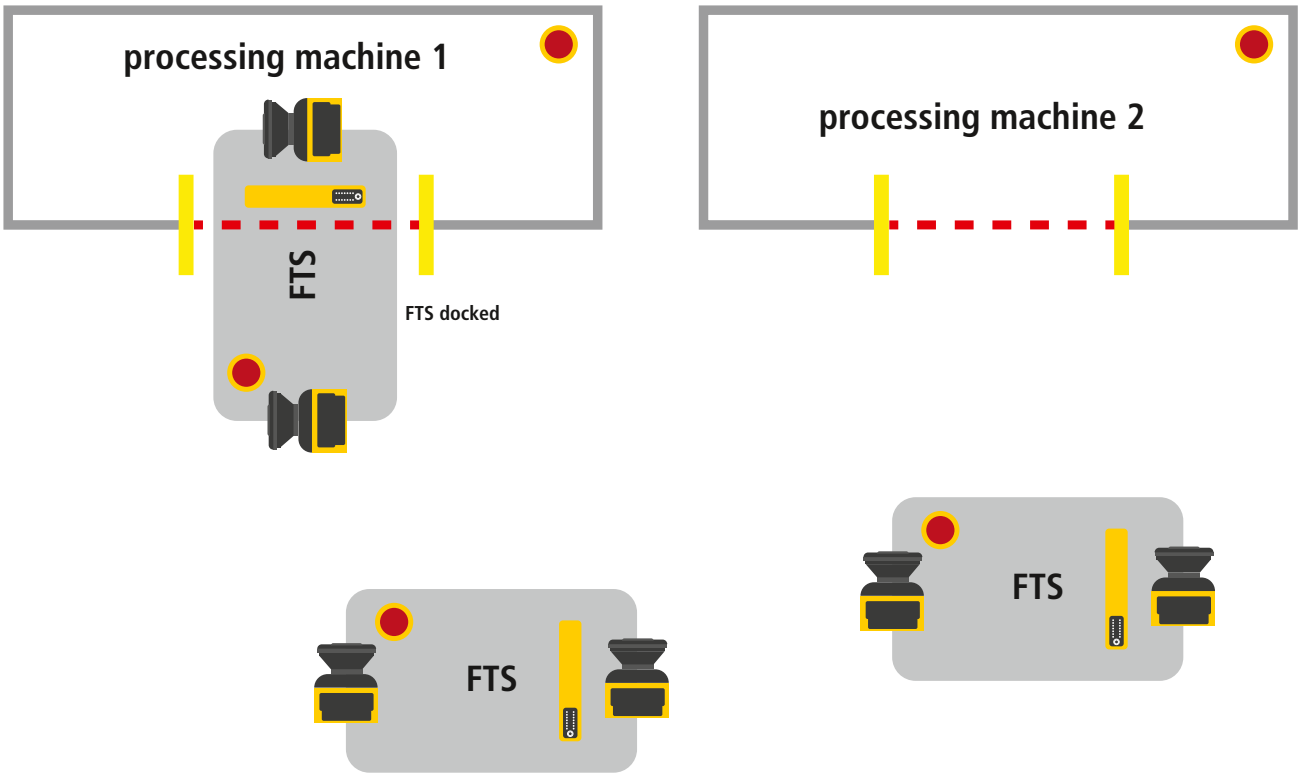
It is often necessary to link the AGV emergency stop to each other, or to stop several AGVs from fixed operator stations via emergency stop. With its wireless mesh network, the Safety Simplifier is the ideal solution for the safety-relevant linking of several AGVs with each other and/or with stationary machines. A Safety Simplifier is mounted on every machine and every AGV. Each Safety Simplifier acts as a master and functions stand-alone, so AGVs can also be flexibly removed from the system and added again. The desired logic can be programmed via the software and safe inputs and outputs can be exchanged as desired and used for decentralized shutdown of the AGV.

Emergency stop linkage



Advantages in the application

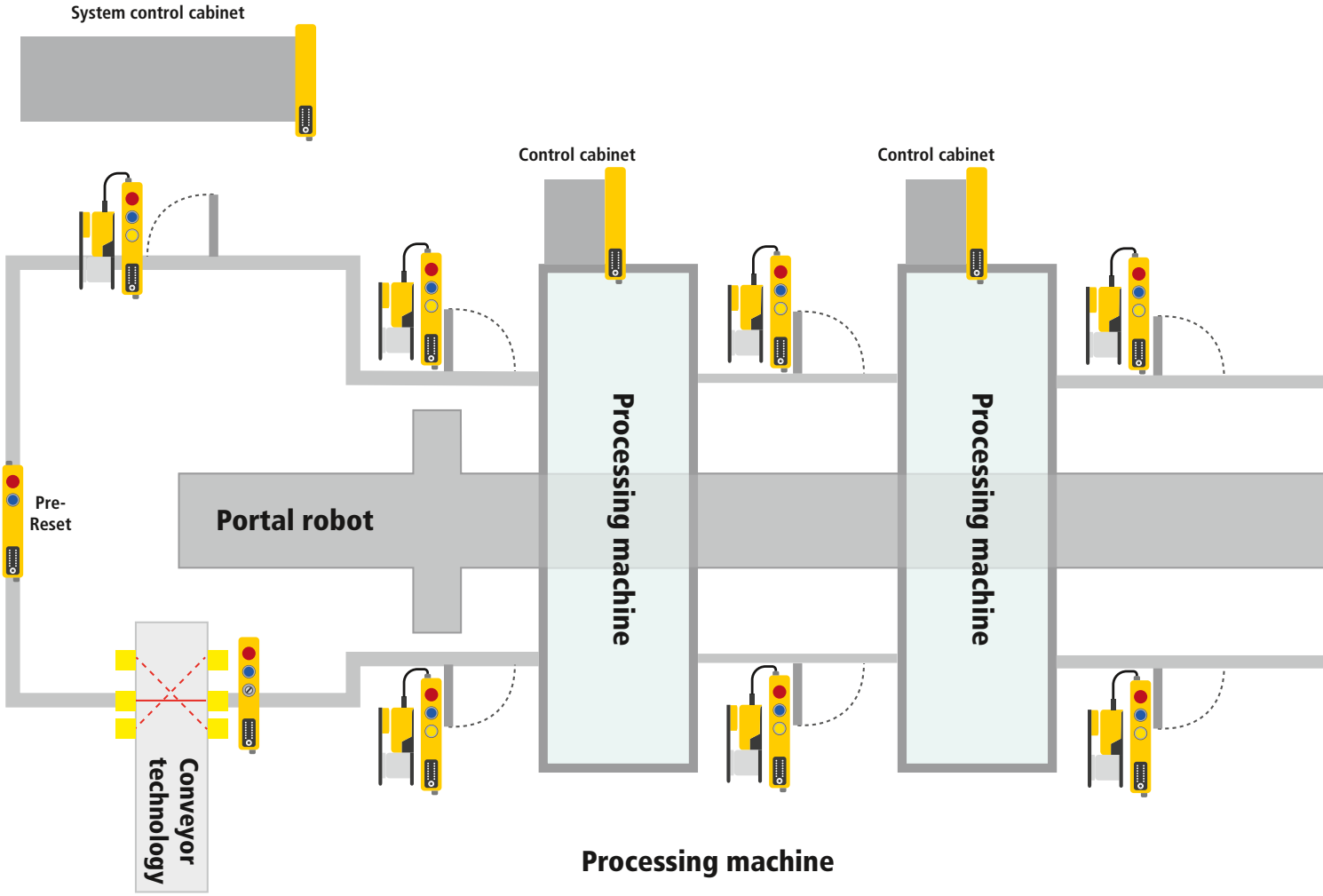
- ✓ Safe, decentralized shutdown of AGV systems
- ✓ Safe linkage of plants with AGV
- ✓ Unlimited number of AGV systems can be integrated
- ✓ Evaluation of safe functions on the AGV (emergency stop, scanner, etc.) via the safe inputs
- ✓ Flexibly expandable system for plant expansion



You can find our preconfigured standard models on the website

Application

Switch off safely the linked plant



Processing machine

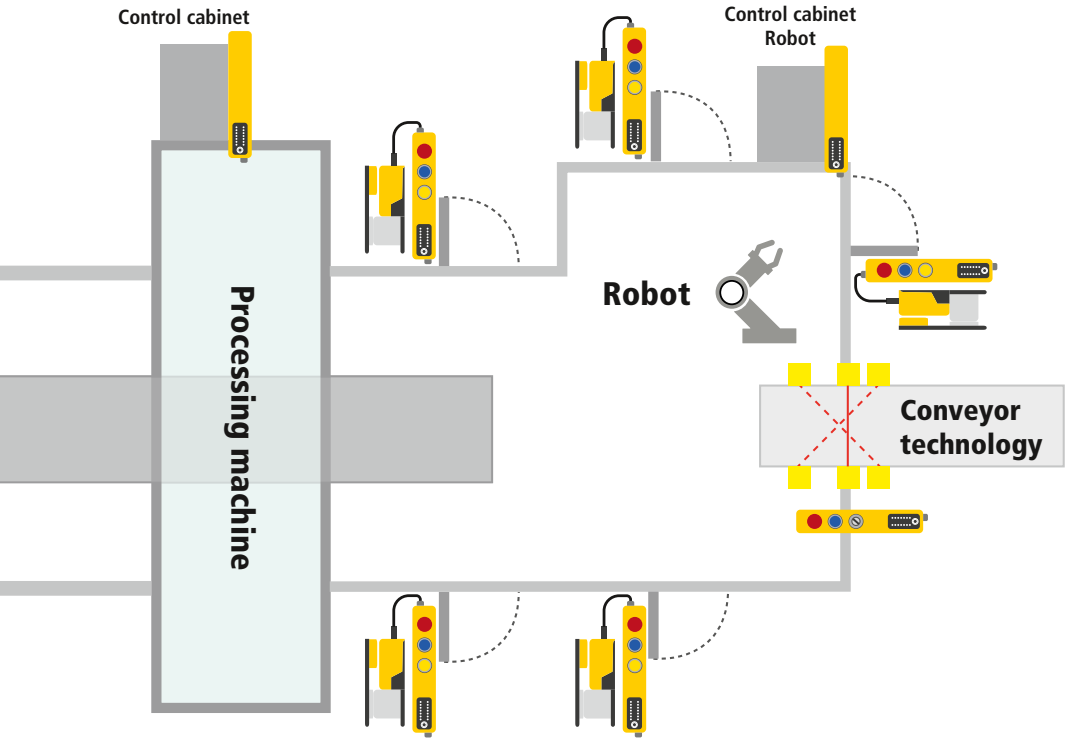
- ✓ Easy expandability
- ✓ Safe communication between gantry robots and processing machines
- ✓ Short, step-by-step commissioning of the safety system on the construction site

You can find our preconfigured standard models on the website

Linked systems

Safety

With its wireless mesh network, the Safety Simplifier is the ideal solution for linked plants



Automated processing machines often have a complex safety system, the emergency stop buttons switch off the entire plant. Material loading and unloading is provided with safety light grids, with or without muting. Safety switches with guard locking secure the service doors of the plant. Areas that can be stepped behind are unlocked with a pre-reset button.

Thanks to the Safety Simplifier, the planning, extension and commissioning of safety technology can be significantly reduced.

The safe, wireless interface between the processing machines, safe sensor system and main control cabinet, together with the high availability of the mesh network, is the perfect solution for the linked plants.

Application

Safety Simplifier wireless distributor

Safety Simplifier interlocking function with EOS4 light grids for unloading of pallets

Application description

The Safety Simplifier interlocking function with the EOS4 safety light grids from REER is used when:

- ✓ Pallets or components are unloaded from the danger zone
- ✓ Muting light grids are normatively not possible
- ✓ Conveyed material that does not block the whole access (e.g. changes, half-full pallets)
- ✓ Different pallet widths or heights are used
- ✓ Components stop in the muting light beam
- ✓ The conveyed material does not have a minimum diameter of 500 mm

Simplifier antenna

Simple signal amplification

Advantages in the application

- ✓ Signal amplification and extension
- ✓ Safety Simplifier can be mounted inside the control cabinet or in other hidden positions
- ✓ The antenna is mounted at wireless-optimized positions, for example above the protective fence

Safety System Products

SSP Safety System Products GmbH & Co. KG
Zeppelinweg 4 · 78549 Spaichingen
Tel. +49 7424 98049-0 · Fax +49 7424 98049-99
www.safety-products.de · info@ssp.de.com

INTERNATIONAL PARTNERS

Find them on our website

www.safety-products.de

Our contribution

Ecofriendly paper
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Modifications and errors excepted
Juli 2023 | 3.0
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