

safety
+
simplicity

sens:Control

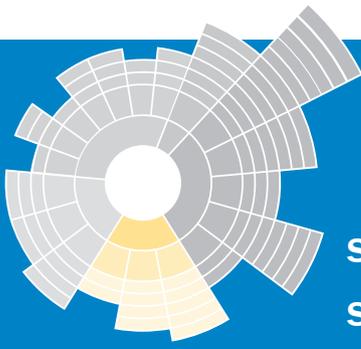


Integrated solutions
can also be simple



sens:Control – safe control solutions

SICK
Sensor Intelligence.



safetyPLUS® — we solve safety problems

Safety solutions from SICK increase your security of investment, open up new potential for savings due to more efficient processes, and always remain focused on the primary objective — the safety of man and machine.

Rock-solid safety concepts for perfect operational safety

safetyPLUS® provides a unique range of competencies for the safety of man and machine. After all SICK is the world's leading manufacturer of industrial safety systems and convinces with an impressive combination of competence, products and services.

Water-tight system solutions for complete safety applications

Behind safetyPLUS® is the world's most versatile product portfolio: A comprehensive safety package from safety switches through optoelectronic sensors to safe control solutions and networks. Simple and trouble-free in application from planning to worldwide usage.





Unlimited potential for savings due to integrated safety concepts

The unique cost-effectiveness of safetyPLUS® saves time and money! This starts with the uncomplicated planning and carries on through installation and commissioning to the actual production. Every SICK technology is as easy as possible to use and will also be up to date in five years time.

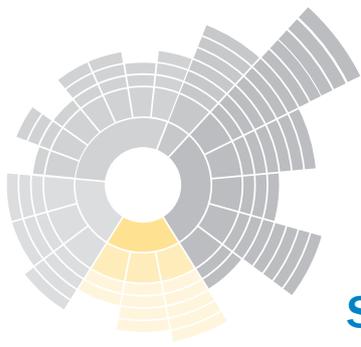


Complete safety by means of services for every day

The safetyPLUS® services: SICK experts advise and assist from the first plant walk-through, during the risk assessment and all the way to the CE assessment – always compliant with the latest standards and directives, and with the SICK inspection seal for machinery and systems.

By the way: Every year SICK performs more than 10,000 safety inspections worldwide.





Service you can depend on

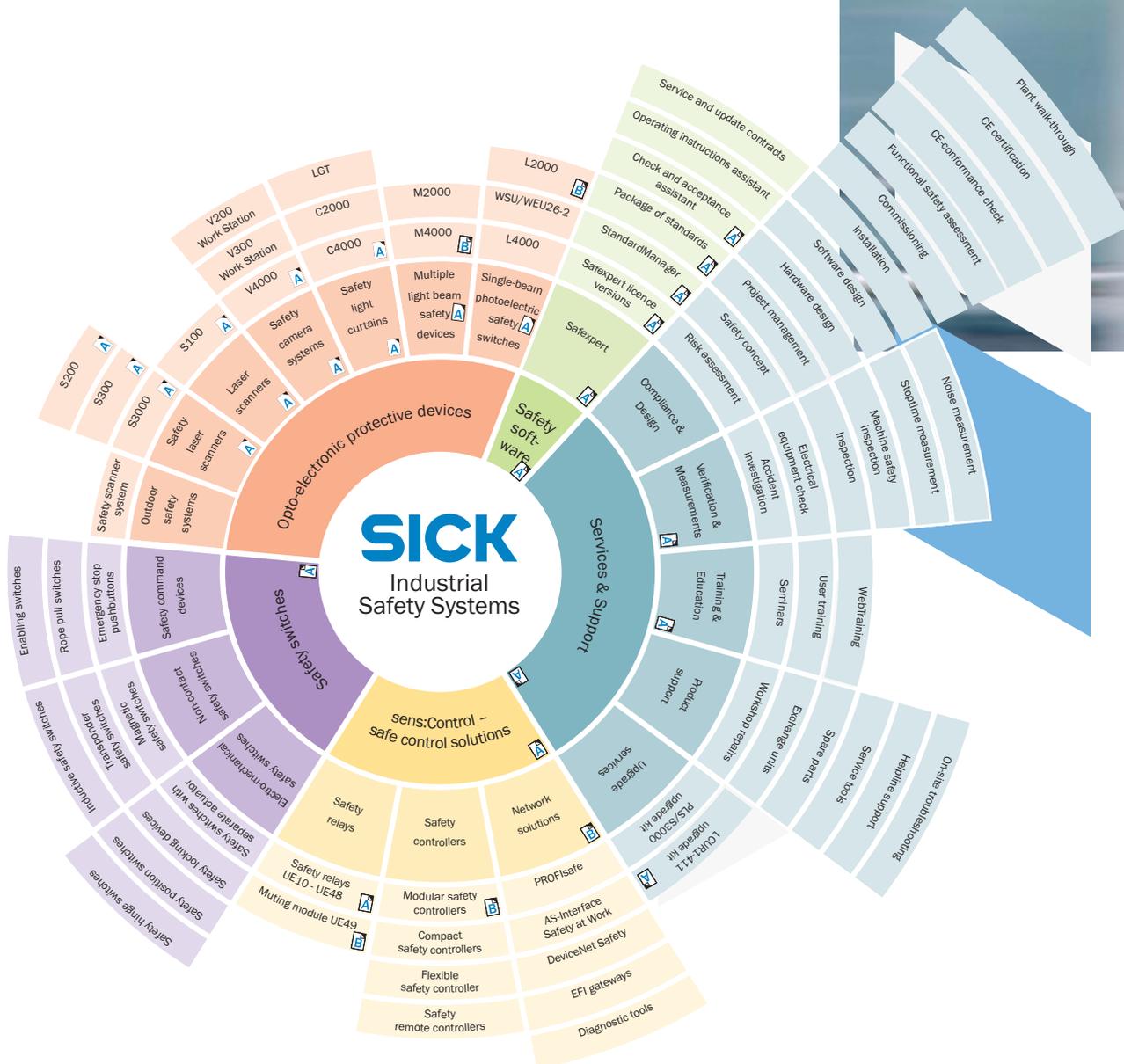
With SICK you will always obtain optimal results in the interaction between man and machine.

With SICK you have, in this sensitive area, a partner at your side whose innovations have been setting international standards for more than 60 years; most recently with safetyPLUS®, the all-round package for industrial safety.

Further informations:

- Product information
- Data sheet
- www.sick.com

Literature **Finder**





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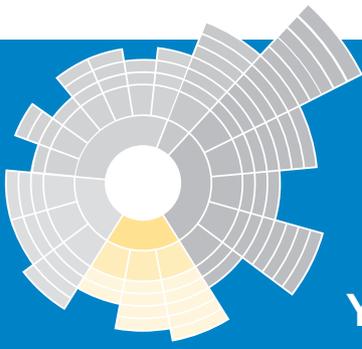
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More safety due to customised service!



Your advantages — explained simply



sens:Control — a new name for safe control solutions

The new generation of safe control solutions from SICK combines advanced technologies with ease of use in every project phase. How does it work? Very simply: SICK developed, from the ground up, a new integrated product concept that was consistently designed for uncomplicated usage.

A comprehensive range of engineering and services

Sometimes it is a long way from planning to reality — but not with SICK! With sens:Control the selection is quick and the configuration simple. In all phases of the project from planning, through commissioning to maintenance and upgrades to existing systems, we support you with comprehensive services.



Overview

Products

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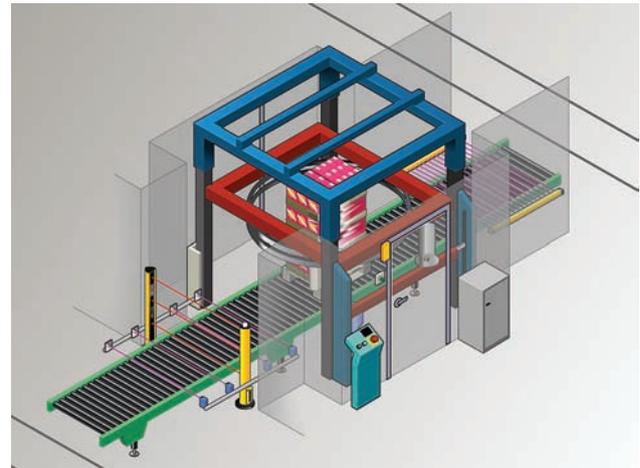
Product selection

safety + simplicity sens:Control – safe control solutions

Application-orientated and platform independent, the safe control solutions with optimal sensor integration.

sens:Control – the advantages:

- Simple selection, uncomplicated engineering
- Easy configuration, low integration effort
- Open for all automation environments
- The right solution for every application, from the relay through the modular controller to networked systems



Simple, quick commissioning



- Either:
Configuration using intuitive user software



- Or:
Configuration via screwdriver

Platform independent integration

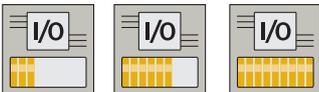


- In standard networks



- In safe networks

Modular and adaptable



- Flexible number of inputs/outputs



- From simple to complex logic



- Modular expandability

Fast Shut-off



- Fast shut-off times reduce the safety distances and provide optimal protection for man and machine

Very easy unit exchange

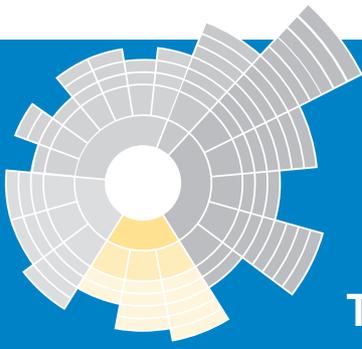


- Captive Flexi-Soft system plug for the complete configuration. Cannot be mixed up, as connected to the machine

Optimal sensor integration



- More functionality due to EFI
- More information on page 9



The optimal solution for every application

sens:Control — safe control solutions for a wide range of sectors

safety + simplicity must be the solution for all sectors and applications.

The range stretches from the simple integration of an emergency stop pushbutton, through the connection of safety switches with emergency stop, e.g. to packing machines, the combination of optical safety sensors with machine contacts on a press, or the combination

of entry/exit stations with access protection in logistics, to the networking of complex systems or linking of modular machines:

sens:Control provides the right solution for all applications and sectors and that with minimum engineering effort.



Safety relays

The complete range makes it possible to integrate all safety components into a machine or system. The safety relays are very reliable and robust and impress with their quick mounting using interchangeable removable terminals.



Safety controllers

Safety controllers can also be simple. Flexi is an open and modularly expandable system for the convenient connection and the intuitive configuration of safety solutions.



Network solutions

For machines and systems with a high degree of connectivity. These solutions permit the integration and evaluation of all safety sensors in all common fieldbuses up to complete safety automation with controllers and remote I/Os.





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Optimal sensor integration

The SICK-specific EFI (EFI = Enhanced Function Interface) is a safe communication interface between SICK devices.

Using this EFI, process data from several users can be transferred bi-directionally with little installation effort and diagnostics can also be performed.

The major advantage of the EFI compared to integration using OSSDs (Output Signal Switching Device) is that diagnostic information from all EFI users with a large amount of data is available to the higher level controller or gateway.

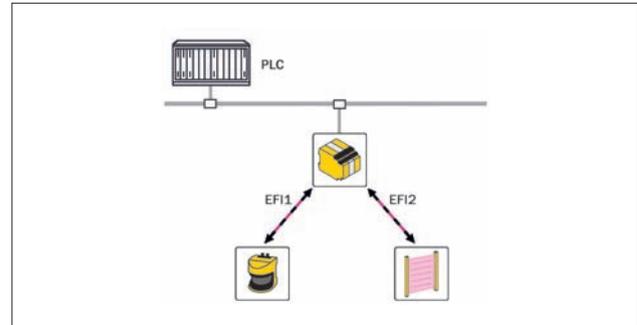
In the case of integration via OSSDs, it is only possible to perform local diagnostics directly at the device. There is no bi-directional communication between the individual users via OSSD signals.

EFI provides a quick overview of the entire system configuration, which means increased capacity to act and therefore increased availability of your machine.

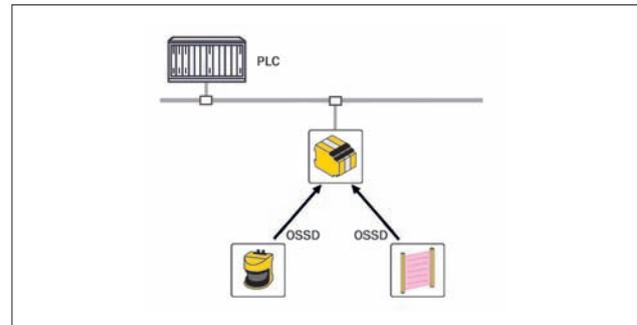
Expanded sensor functionality means, e.g.:

- Simultaneous protective field evaluation (S3000 safety laser scanner)
- Protective field switching
- Operating mode switching
- Sampling of status signals (e.g. contamination of the front screen)

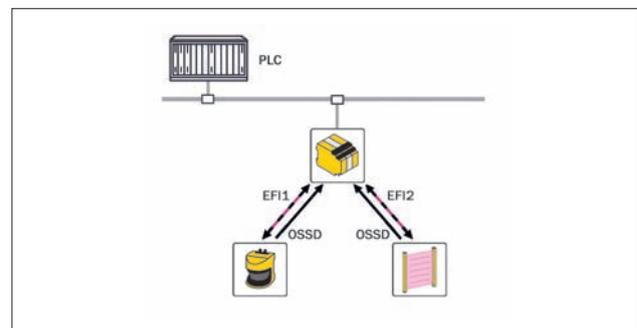
For diagnostics and to achieve the fastest response times, with SICK it is possible to connect the sensors to the safety controller using the interaction of EFI and OSSDs. By means of this optimal connection of EFI and OSSDs, the EFI users can communicate with each other and the machine can be quickly switched to a safe state.



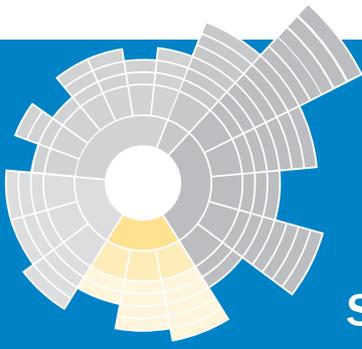
Integration via EFI



Integration via OSSD



Optimal connection of OSSD and EFI



Simplicity in the foreground

Safety relays

The safety sensors encompass a large range of products, from the single-channel emergency stop pushbutton to the safety laser scanner with PNP outputs. Additionally, there is the need for manual or automatic reset and application-related logic such as muting and safety locking.

The SICK relay family encompasses 14 different variants with the objective of being able to connect all types of sensors; the right relay for all your requirements.

- Simple integration of all safety components
- Compact devices: up to 4 safety contacts in a 22.5 mm housing
- Reliable and robust
- Numerous connection diagrams online
- Fast mounting due to removable terminals



All products are approved:

- up to category 4 according to EN 954-1 or
- for applications up to Performance Level e according to ISO 13849-1 and
- up to SIL3 according to IEC 62061



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Integration of single-channel sensors and OSSDs:

Optical safety devices have OSSD outputs that only need a simple relay. The UE10 series and the UE12 series are particularly suitable for these sensors. If more outputs are required, you can use the cascading function. The UE23 family is also suitable for this function; with its simplicity this family is aimed particularly at single-channel sensors.

Applications:

- Storage and conveyor technology
- Packaging



Application-orientated relay:

Special applications require specific relays. For example in the case of a two-hand control panel, you can use the UE42-2HD. This and other applications can be solved without problems by using a special relay. Relays for special applications are:

- UE42-2HD: for two-hand control panels
- UE44-3SL: for safety locking device
- UE45-3S1: for stop category 1
- UE49: the muting specialist

Applications:

- Presses
- Logistics



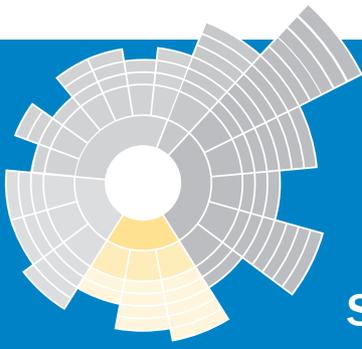
Universal relay:

The majority of machines are only protected using safety switches. This is the application area for which the UE43 family is intended. Simply select the type of voltage supply, the type of reset and the number of outputs and you are already done. For more versatile usage, the UE48 family has additional features, for example the control of pressure sensitive mats; simply universal!

Applications:

- Robots
- Electronics





Shut off simply

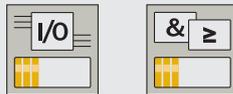
Application-orientated specialists

For example UE42-2HD



Product description

- Specially designed for a two-hand control panel
- Complies with EN 574 for type III C devices
- 2 N/O contacts and 1 N/C contact



Customer benefits

- Integrated external device monitoring (EDM)
- Low control cabinet space requirement

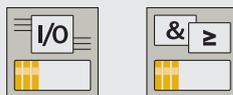
... and the all-rounder, a relay for all sensors

UE48-20S, UE48-30S



Product description

- For emergency stop pushbuttons, safety switches, safety light curtains and safety laser scanners
- 3 N/O contacts and 1 N/C contact or 4 N/O contacts
- Automatic or manual reset



Customer benefits

- Low stockholding due to reduction in number of variants
- Integrated external device monitoring (EDM)
- Rapid commissioning due to removable terminals
- Low control cabinet space requirement



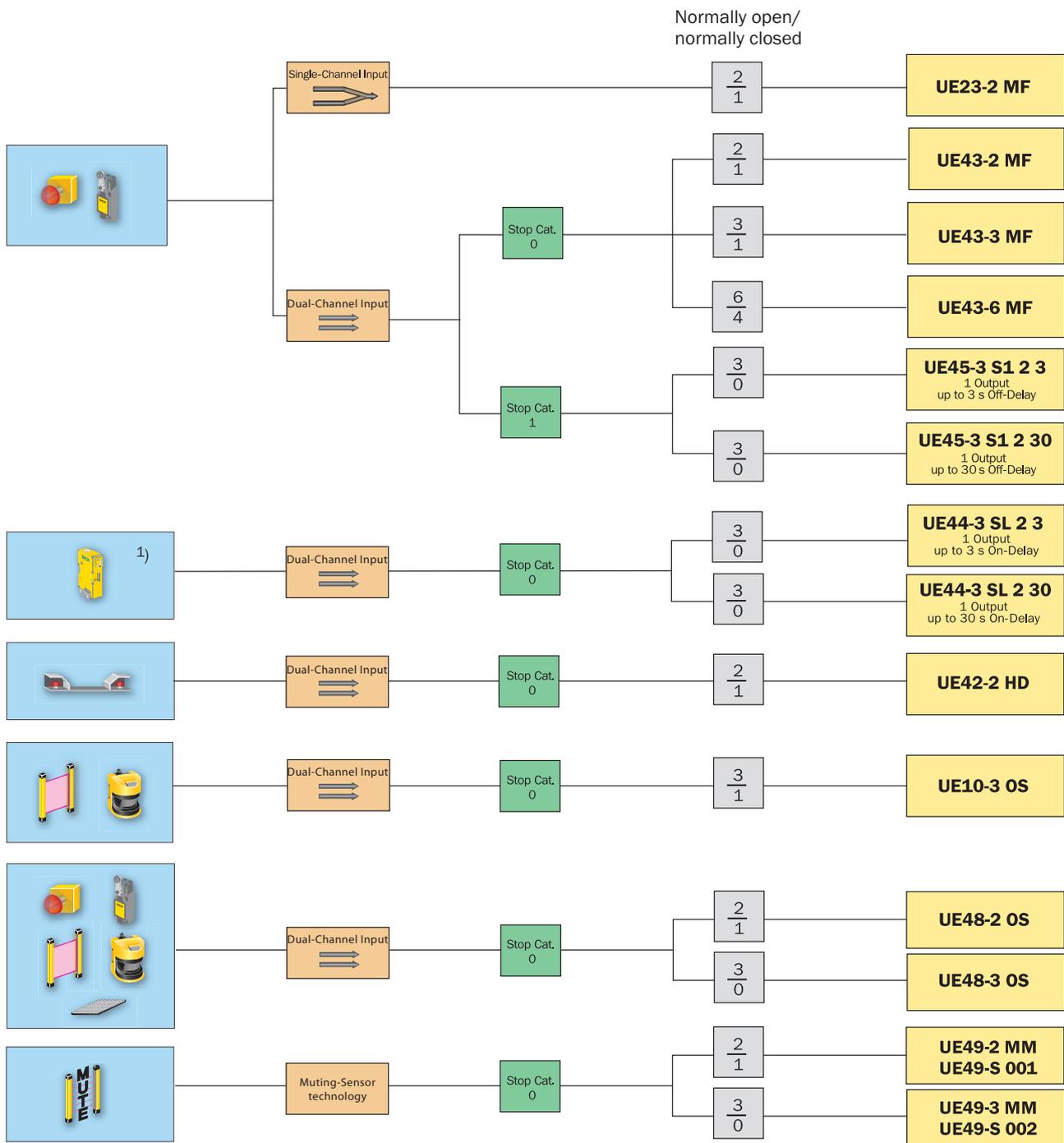
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Products

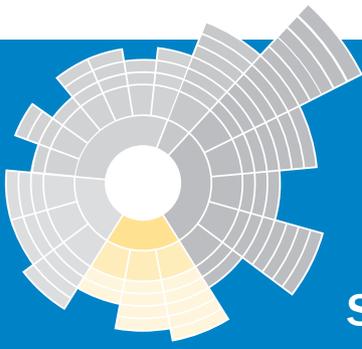
Services & Support

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¹⁾ Safety switches with mechanical locking



Safety controllers can also be simple

Safety controllers

Openness, scalability and modular expandability are customer requirements that SICK solves with the flexible sens:Control – safe control solutions.

In the foreground here are very simple operation and optimal integration of all safety components to solve integrated safety applications. Depending on customer requirements, products are available in compact designs or modularly expandable up to IP-67 variants.

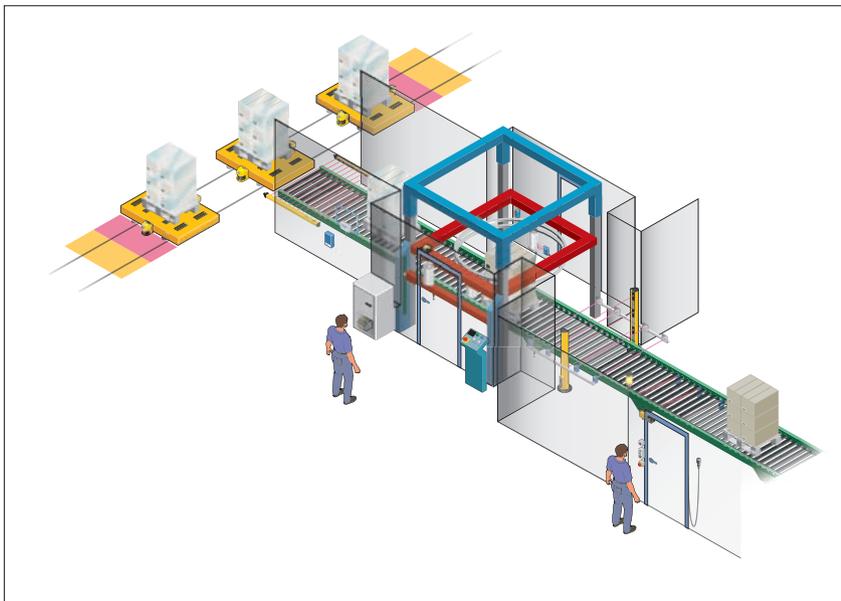
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- up to SIL3 according to IEC 62061



The simplest: Flexi Classic

- Automate simply
- Configuration via screwdriver



Applications:

- Storage and conveyor technology
- Packaging industry





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The smallest software-based: Flexi Soft

- Integrate conveniently
- Modular multitalent with intuitive configuration software



Unique in IP 67: UE4427, UE4457

- Fully automate with safety remote controllers
- Makes possible usage directly on the machine



The most compact with network master: UE4470

- Flexible safety controller
- Safe networking of machines

Applications:

- Automated guided systems
- Robots

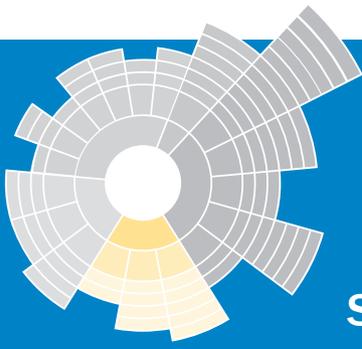
Applications:

- Muting stations
- Rotary table applications

Applications:

- Linked systems
- Robots
- Handling systems





Safety controller without software

Flexi Classic

An overview

Direct sensor operation and additional fully integrated logic saves time when designing the circuit diagram and installing the wiring.

Adjustment using a screwdriver saves the need for a computer during commissioning and maintenance of the system.

Product description

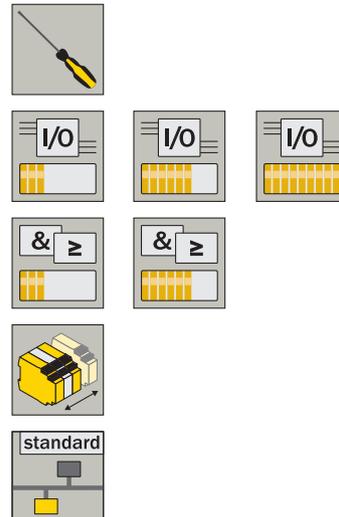
- Can be configured on the front of the device using a screwdriver
- Direct wiring with every type of sensor
- Logical operators (And/Or/Muting/Bypass/Reset/External device monitoring)
- The controller grows with the application
- Integration in all leading networks: CANopen, PROFIBUS-DP, DeviceNet, Ethernet TCP/IP, Ethernet IP, Modbus TCP

Customer benefits

- Optimal graduations prevent superfluous inputs and outputs
- Freely selectable outputs by means of modules with transistor outputs and relay contacts
- Configuration and device replacement via screwdriver



Development on the desk, installation on site, diagnostics anywhere





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Powerful logic with the simplicity of a screwdriver

Flexi Classic is a modular system on which the related logic functions (And/Or/Muting/Bypass) are defined using a rotary switch.

Flexi Classic can operate with all types of sensors, e.g. light curtains, laser scanners, emergency stop pushbuttons, mechanical and electrosensitive switches and much more.

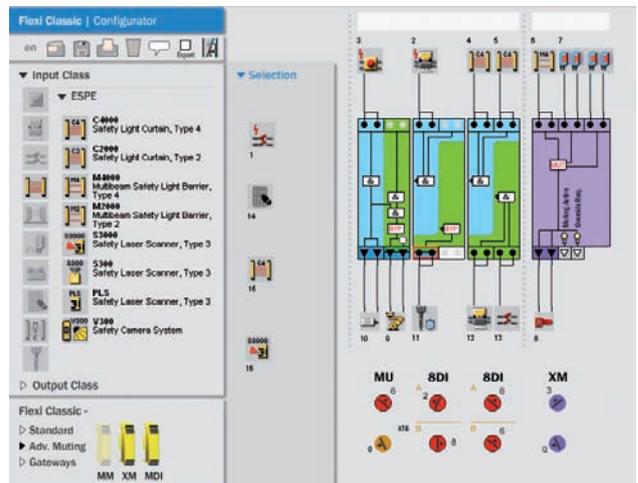
Each logic module provides 8 I/O and up to 9 different programs. All these simple features, once connected together, make it possible to solve a very wide variety of applications even without software.



Configuration: the software can help!

The Flexi-Classic configurator is an immense help in preparing a Flexi system. You can place modules side by side; adding sensors and actuators using drag-and-drop and the view of the internal logic make design quick and easy.

You will find the configurator at: www.sens-control.com

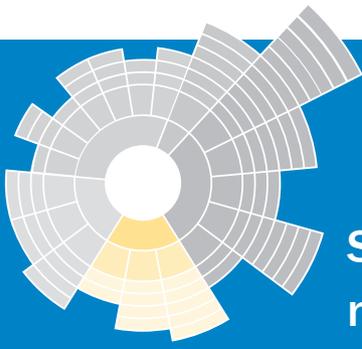


The muting expert:

The Flexi Classic can, as one of its possible uses, solve muting applications. Modules specially designed for muting are available for more complex applications. They provide a complex range of functions that meet every requirement, for example direction monitoring, sequence monitoring, override etc.

Possible uses for the diagnostics

Status and diagnostic information is made available via gateways over all leading fieldbuses, such as CANopen, PROFIBUS-DP, DeviceNet, Ethernet TCP/IP, Ethernet IP and Modbus TCP.



Simplest answer to demanding machine requirements

Flexi Soft

Versatility re-defined

The Flexi Soft modular safety controller provides function modules that can be flexibly combined, is of compact design in any final configuration, has software-based logic functions and expanded features for fieldbus integration.

Flexi Soft is suitable for the control and monitoring of a large number of tactile and electrosensitive safety sensors, e.g. guard switches, emergency stop devices, light curtains or laser scanners.

The system is designed for the combination of 12 Flexi Soft modules. Available are an I/O expansion module with eight inputs and outputs, a pure input expansion unit with eight inputs, two relay modules as well as gateways for integration in all leading fieldbuses. On the usage of intelligent safety sensors, a safety controller variant with EFI (Enhanced Function Interface) is available.

Product description

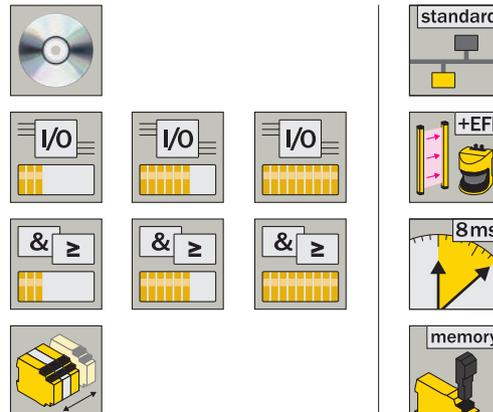
- Shortened response time and therefore shorter distance from the hazardous point due to fast shut-off favours the construction of smaller machines
- Configuration via intuitive software with a graphical user interface
- Function block based logic editor with comprehensive library of certified function blocks
- Optimised integration via EFI (e.g. S3000, C4000)
- Integration in all leading networks: CANopen, PROFIBUS-DP, DeviceNet, Ethernet IP, Ethernet TCP/IP, Modbus TCP

Customer benefits

- Graduations prevent superfluous inputs and outputs
- Configuration memory in the system plug for rapid commissioning
- Intuitive software with tabular wiring plan
- Expanded sensor functionality via EFI



Modular multitalent





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Simple and individual:

The Flexi Soft is a powerful, modular, software-based safety controller that can be efficiently adapted to the requirements of a variety of safety applications due to its scalability.

Intuitive: Hardware configuration via software interface

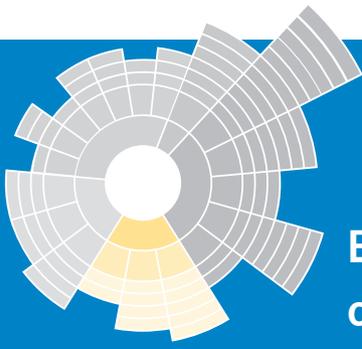
After the selection of the Flexi Soft modules to be used, all the necessary sensors and actuators can be "wired" simply using the drag-and-drop principle, and parameters configured. The inputs and outputs defined are then available in the logic editor, which includes more than 30 different logic and application-specific function blocks. You can download the Flexi Soft Designer free of charge at: www.sens-control.com



Commissioning via system plug

Writing the configuration to the separate system plug moves the programming to the office and for commissioning it is only necessary to connect the system plug at the production line. As the voltage supply is also provided via this plug at the same time, a system plug can be changed at any time without any wiring effort. This feature makes a laptop on site unnecessary.





Even distributed machines and systems can be easily automated

Network solutions

A distributed system is the best choice if maximum flexibility with minimum overall costs is required. Today remote solutions must be openly scalable and modularly expandable.

Modern software tools support the designer during the optimisation of the system performance.

Network solutions from SICK permit the integration and evaluation of all safety sensors in all common bus systems, all the way to complete safety automation with programmable controllers and remote I/Os. Optimal remote functionality and convenient diagnostics for fast troubleshooting are a matter of course.

All products are approved:

- up to category 4 according to EN 954-1 or
- for applications up to Performance Level e according to ISO 13849-1 and
- up to SIL3 according to IEC 62061

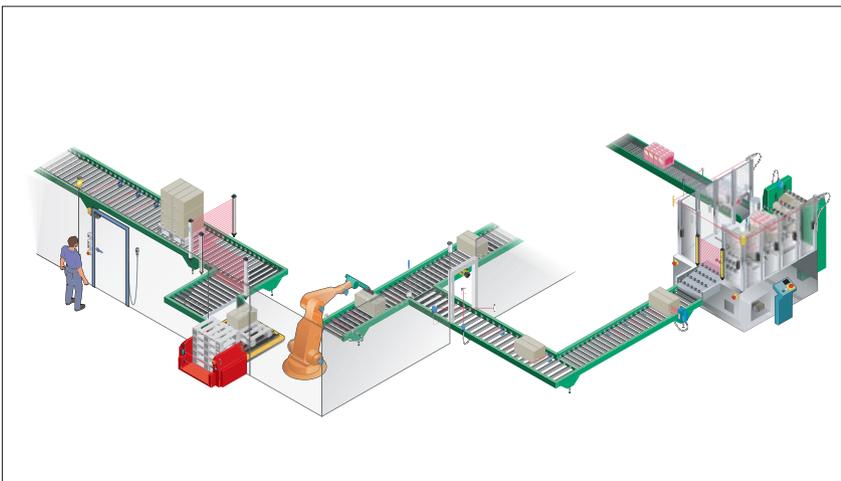


Automate simply: AS-Interface Safety at Work

- Complete safety automation with AS-i monitor and slaves
- Bus nodes in IP 65 and IP 67 for simple safety automation without the need for a control cabinet

Applications:

- Storage and conveyor technology
- Packaging industry





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Product selection



Integrate conveniently: PROFIsafe

- Optimal integration and pre-evaluation of all safety sensors on PROFIsafe
- Convenient diagnostics for fast troubleshooting
- Minimisation of the number of users in the network due to intelligent bundling directly in the field

Applications:

- Assembly systems
- Automotive industry



Complete automation: DeviceNet Safety

- Complete safety solution with compact controller and remote I/Os
- Open safety automation based on globally accepted standard
- Convenient, uniform diagnostics for fast troubleshooting
- Remote controller in IP 67 for safety automation directly on site without the need for a control cabinet

Applications:

- Robots
- Handling systems



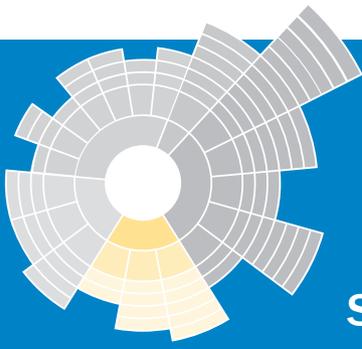
Use more functionality: EFI gateways

- Optimal utilisation of the convenient sensor functionality from SICK now available in all leading network standards
- Convenient, uniform diagnostics on the sensors for fast troubleshooting

Applications:

- Automotive industry
- Machine tools





Simple — flexible — networked

DeviceNet Safety Remotely automate conveniently

Product description

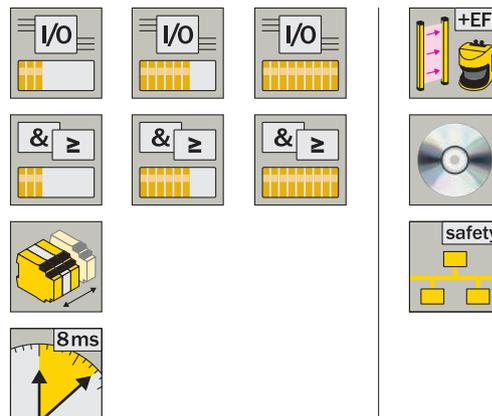
- Safety automation system with network support
- Uniform graphical user interface for the configuration of the system and the devices right down to the sensor
- Comprehensive library of certified function blocks for evaluation and logic available

Customer benefits

- Complete safety automation for uniform solution from a single source
- Best possible overall solution, as sensors and controller are optimally matched
- Usage of an open and internationally recognised network standard
- Unique — distributed intelligence can be easily realised with a remote controller in enclosure rating IP 67
- Unmatched fast, constant system response times, independent of the network load due to Fast Shut-off



The complete solution — everything from a single source





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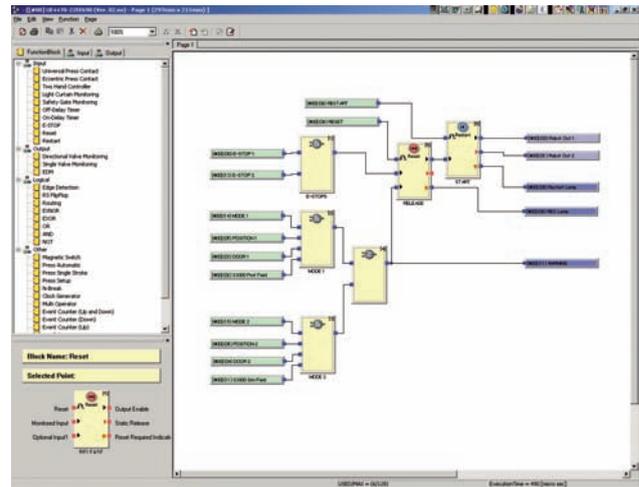
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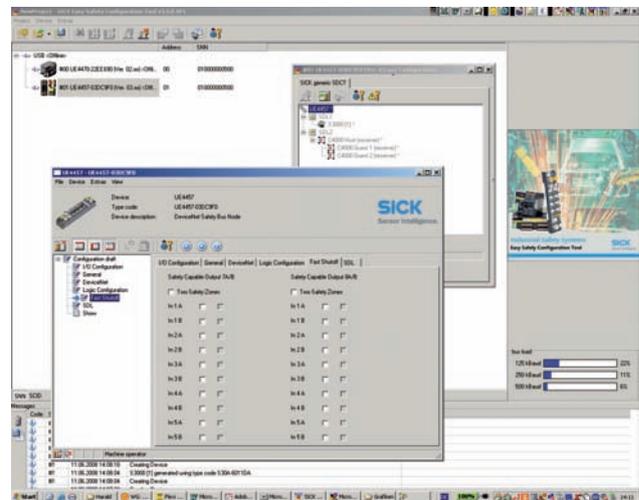
UE4470: The compact central unit

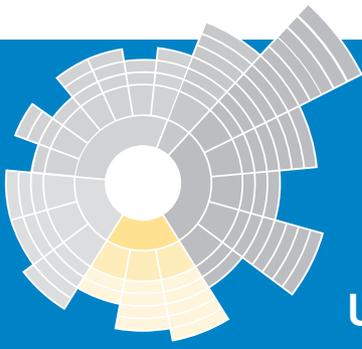
- Flexible safety controller with comprehensive libraries of certified function blocks
- Pre-configured functions for the quick realisation of the application, e.g.: different muting variants or functions for complete press protection
- Modular expandability – the system simply grows along with your requirements.



UE4457: Fast, direct in the field

- Automate directly in enclosure rating IP 67
- Can be used as stand-alone or also in a network
- Constant and super-fast shut-off with Fast-Shut-off function
- Certified function blocks directly on-board





Uniform configuration and diagnostics

EFI gateways

Product description

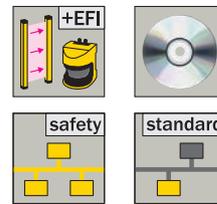
- The integration of SICK safety sensors and systems in higher-level fieldbuses and networks is realised using EFI gateways
- Integration of the safety solutions in standard and safety PLCs or in an existing network
- EFI gateways are available for following networks/field-buses: PROFIBUS-DP, PROFI-safe on PROFIBUS, CANopen and Ethernet TCP/IP

Customer benefits

- Complete system diagnostics
- Uniform configuration and diagnostics in the entire application
- Sensors connected can be displayed on the HMI via the OPC server
- Remote diagnostics possible using the Ethernet TCP/IP gateway



Diagnostics made easy





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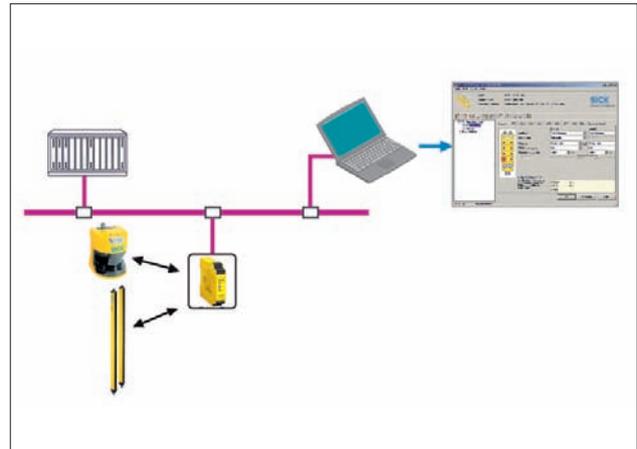
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Integration

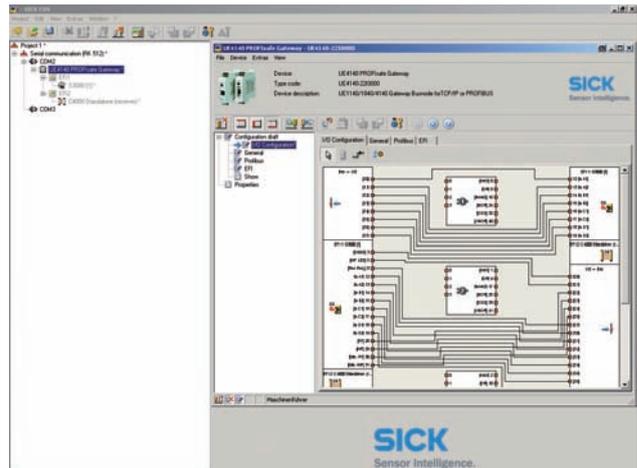
The SICK sensor system is integrated via the EFI on the EFI gateway. Each EFI gateway has 2 EFIs to which, for instance, S3000 safety laser scanners or C4000 safety light curtains can be connected. Due to the integration on the EFI, expanded sensor functionality, e.g., simultaneous protective field evaluation (S3000 safety laser scanner) or operating mode switching is available.

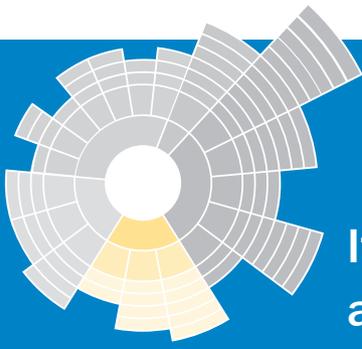
In addition, due to the usage of the EFI gateway, all configuration and diagnostics data are available to the customer for transfer to a higher level controller. The PROFIsafe gateway has the special feature that safe data can be exchanged bi-directionally between the SICK sensor system and the higher level controller.



Configuration

The gateway is configured using the CDS configuration software supplied. The data to be exchanged between the SICK system and the higher level controller are configured using this software.



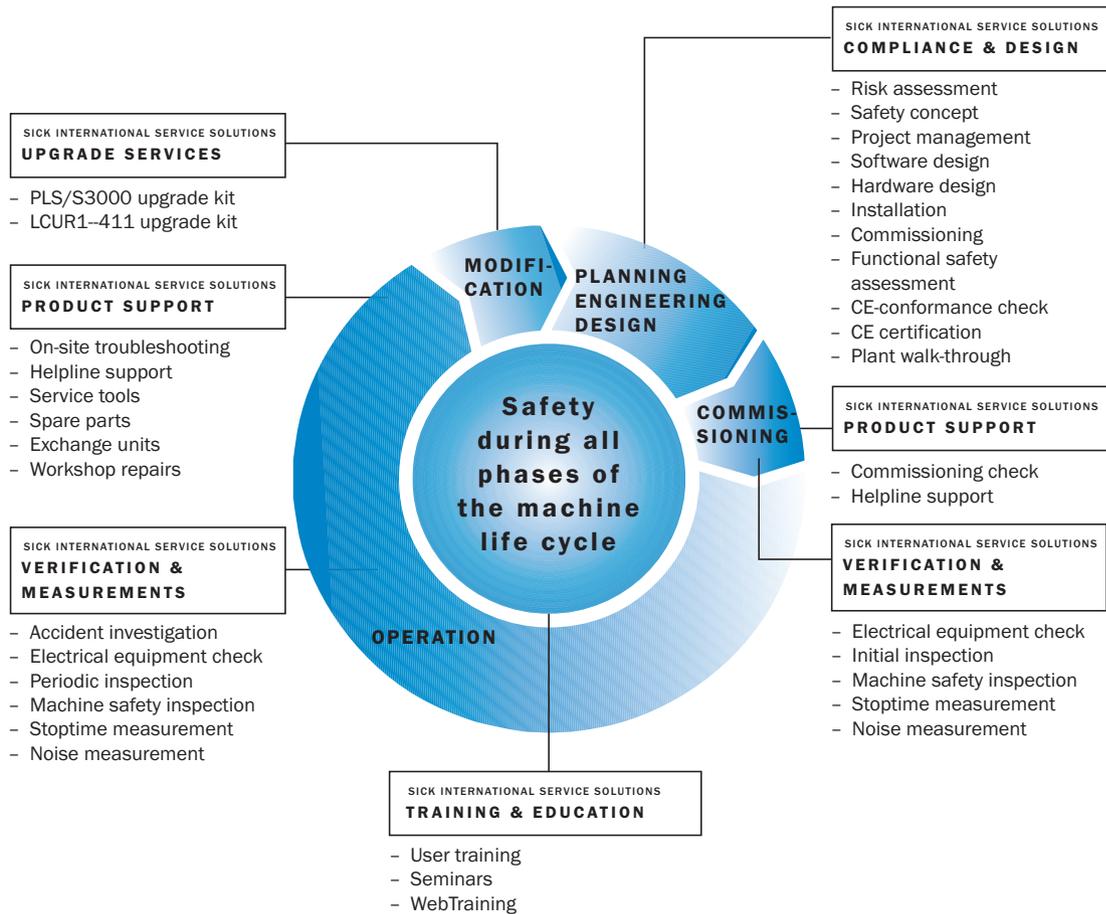


It is hard to believe what can be achieved with SICK

From planning through operation to modernisation: International Service Solutions

With the installation of first-class SICK sensor technology, the subject of safety is still a long way from complete. Safety with “Sensor Intelligence” after all is a continuous process which remains relevant throughout the whole life cycle of a machine or plant: From planning through operation to modernisation.

With SICK “International Service Solutions” you profit in all phases from the international know-how of the market leader of safety products and the experience gained from different sectors and countless applications.





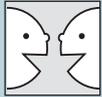
Overview

Products

Services & Support

Applications in detail

Product selection



Compliance & Design

“ Safety from the start!
Over-sizing is prevented
and as a result competitiveness ensured! ”



Product support

“ Construction completed.
Everything perfectly installed. Now we can get started.
Trouble-free from the start. ”



Training & Education

“ Everything was explained in detail.
It is hard to believe what
can be achieved with SICK. ”



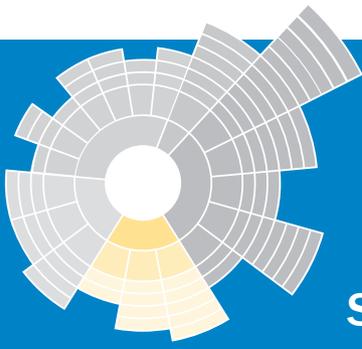
Verification & Measurements

“ Things change over time.
So it is better to check again
whether everything is still correct. ”



Upgrade services

“ At some point the technology became obsolete.
We found a solution together.
In no time everything was up to date again. ”



Safety sensors simply integrated

Straightforward automatic hazardous area protection on a palletizer station

Application Finder
 SICK is continuously publishing examples of application solutions on the Internet
 → www.sick.com

Task

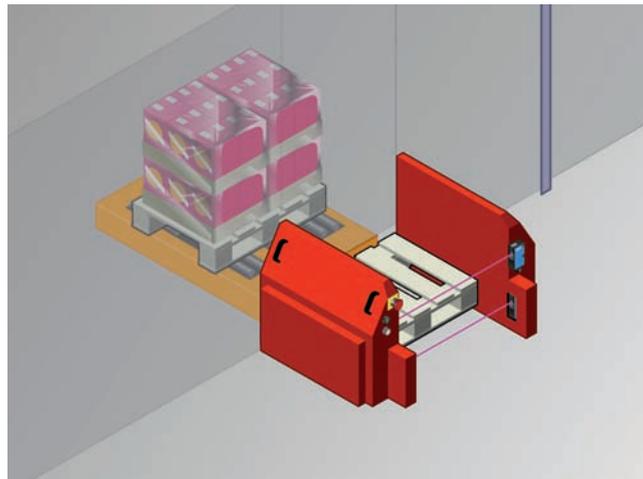
A palletizer station is to be protected using an emergency stop pushbutton that stops the pallet movement immediately when it is actuated. The movement is only allowed to be re-started after the Reset button has been pressed and released again.

Implementation

This safety function can be realised easily and reliably by connecting the emergency stop pushbutton to an UE43-4MR safety relay. This relay can monitor the connections on emergency stop pushbuttons and safety switches, and provides cross-circuit detection in case of dual-channel operation. It has 4 self-monitored safety capable outputs. It provides an EDM function (External Device Monitoring) for the devices that it switches. If, as in the case described, a manual reset is required, the reset function is monitored to prevent the unexpected starting of the machine due to an electrical or mechanical malfunction in the reset device. By linking the emergency stop pushbutton to the UE43-4MR safety relay, the palletizer station is shut down quickly and reliably on the actuation of the emergency stop pushbutton. A control unit is not necessary.

Application overview

Task	Hazardous area protection
Industrial sector	Assembly, handling, robotics, automation
Application location/type of machine	Pallet store
Safety functions	Tool/machine protection, reset/restart
Product family	UE43-3AR/MR, ES21



Customer benefits

- Complete monitoring of an emergency stop pushbutton
- Small size: 4 safety capable outputs in 22.5 mm housing
- Fast response time: 10 ms
- With EDM (External Device Monitoring) and monitored reset function



Overview

Products

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Product selection

Integration of a safety light curtain in the emergency stop circuit on a press

Application Finder
 SICK is continuously publishing examples of application solutions on the Internet
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Task

A press is to be protected using a safety light curtain. If the operator reaches into the press during operation, the machine immediately stops the dangerous movement. The machine is only allowed to be able to start again after the Reset button has been manually actuated.

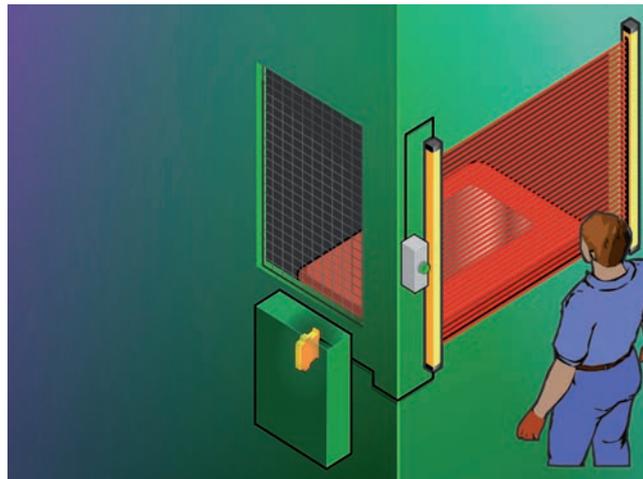
Implementation

This task can be solved by connecting a light curtain to a safety relay. The safety relay monitors the safety capable outputs on the optical monitoring device and stops the machine on the interruption of the safety light curtain. The UE48-3MR has 3 N/O contacts and an additional N/C contact as a status output.

It monitors the reset function. As it only permits restarting after the Reset button has been released, it ensures the machine does not start unintentionally. An EDM function (External Device Monitoring) is available for the devices that are switched by the relay. By directly linking the safety light curtain to the UE48-3MR safety relay, incorrect reaching into the machine will result in the rapid shut down of the dangerous movement on the press. A safety controller is not required.

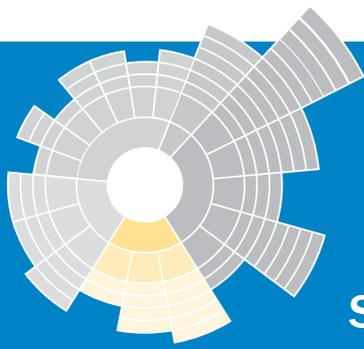
Application overview

Task	Hazardous point protection
Industrial sector	Machine tools and production systems
Application location/type of machine	Presses
Safety functions	Reset/restart, tool/machine protection
Product family	C4000 Eco, UE43-3AR/MR



Customer benefits

- Any type of safety light curtain can be connected
- Small size: 3 safety capable outputs and one status output in 22.5 mm housing
- Fast response time: 10 ms
- With EDM (External Device Monitoring) and monitored reset function



Safety automation without software

Safety automation on a wrap-around tray packaging machine

Application Finder
 SICK is continuously publishing examples of application solutions on the Internet
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Task

A wrap-around tray packaging machine picks up drink cartons and places them on a tray insert. The machine aligns the tray insert and bonds it to a carrier (tray) that now securely restrains the items during transport.

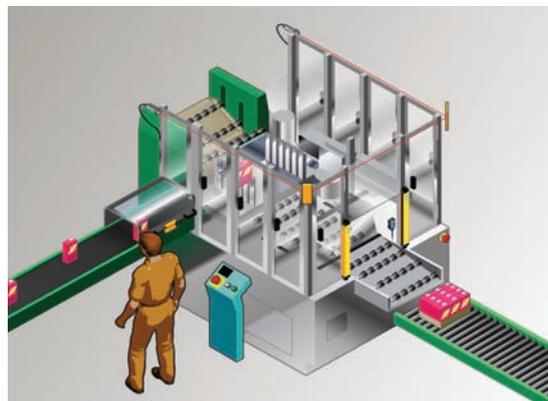
The packaged items enter the system via a tunnel that can be opened. When closed, the tunnel prevents direct reaching into the danger zone. The conveyor belt must be stopped when the tunnel is opened. The outlet on the packaging machine is to be protected against reaching in using an electro-sensitive protective device. Nine service doors are to be economically protected against opening. Emergency stop pushbuttons are used to stop the entire machine in case of danger.

Implementation

The tunnel is protected with an RE300 non-contact safety switch. When the tunnel cover is opened, this switch shuts down the conveyor belt and the machine: the dangerous movements are stopped. A C2000 safety light curtain is fitted to the exit on the machine. This light curtain is muted by a signal from the PLC (programmable logic controller) and a WL27 photoelectric reflex switch when the packaged items leave the machine on their carrier. If a person reaches in here, the C2000 shuts down the conveyor. The nine doors on the machine are secured using one L4000 photoelec-

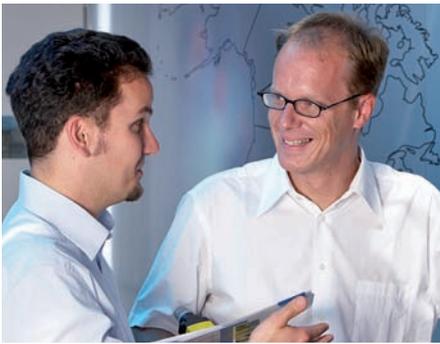
Application overview

Task	Safety automation, hazardous point protection, access protection
Industrial sector	Food & beverage
Application location/type of machine	Packaging machines
Safety functions	Emergency stop function, differentiation between man and material (muting), safety-related stop function, reset/restart
Product family	C2000, Flexi Classic, L4000, RE300



tric safety switch and two deflector mirrors. If one of these doors is opened, the light beam is interrupted: the L4000 sends a stopping signal to the Flexi Classic. This controller generates a shutdown signal that is sent to the controller for the machine. With the doors closed, the packaging machine is re-started using a reset button. The actuation of an emergency stop pushbutton interrupts the supply of power to the machine. All safety sensors are connected to a Flexi Classic modular safety controller. The Flexi Classic performs

all the safety control functions. The necessary logic can be selected using rotary switches. Software is not necessary.



Overview

Products

Services & Support

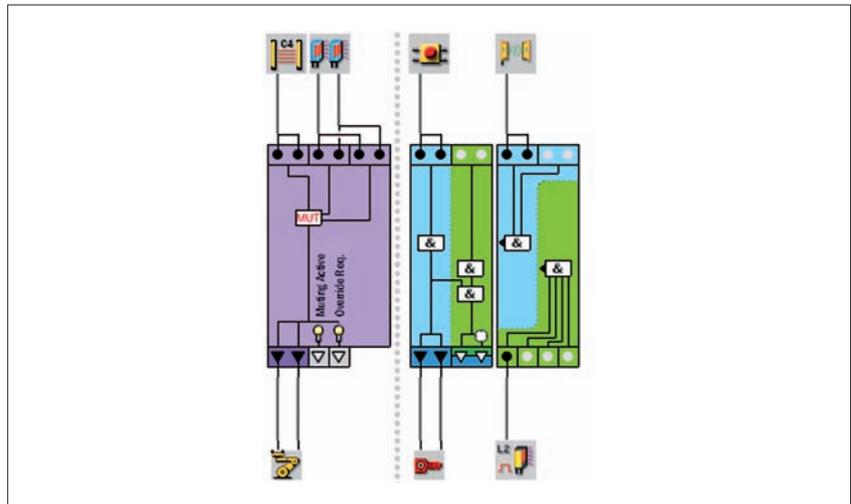
Applications in detail

Product selection

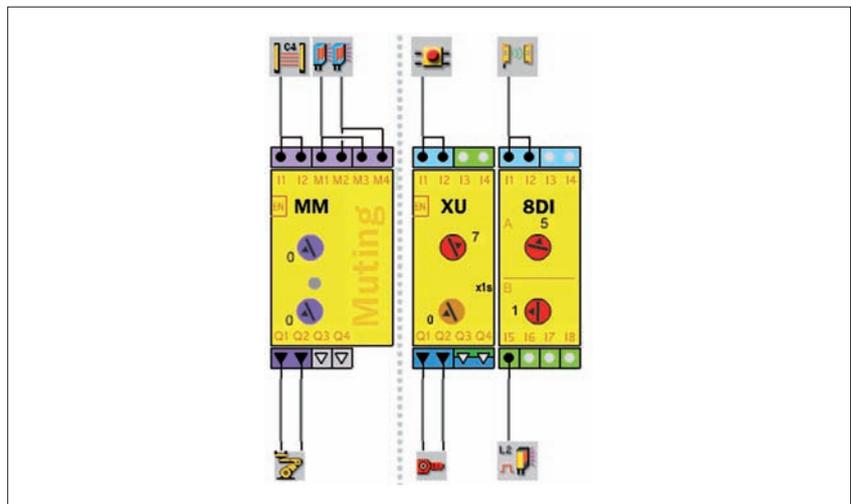
Customer benefits

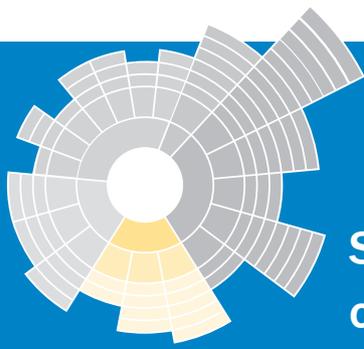
- Flexi Classic replaces a series of safety relays, including a muting module
- The L4000 photoelectric safety switch replaces nine safety switches with one light beam
- Reduced hardware costs and wiring effort
- Shortened response time in comparison to relay

View of the logic functions in the Flexi Classic configurator: logic at a glance



Circuit diagram from the Flexi Classic configurator view: sensor connection and program selection at a glance





Simplest solution for demanding customer requirements

Hazardous area and access protection on a robot cell

Application Finder
 SICK is continuously publishing examples of application solutions on the Internet
 → www.sick.com

Task

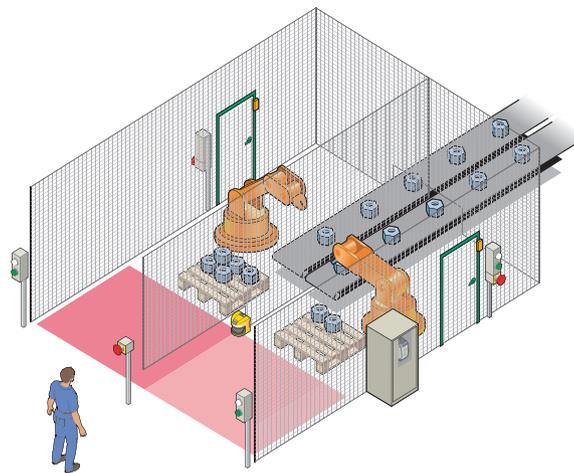
In two neighbouring automatic cells, two robots independently place workpieces on pallets. The working areas of the robots are bounded by fences. Access through two service doors is to be protected by safety switches. The safety switches act on the related robot. Two emergency stop pushbuttons at the doors are also to stop the robots. The vehicular access for the fork lift truck is to be protected using laser scanners that interrupt the movement of the robots if one of protective fields they monitor is entered. An emergency stop pushbutton on each door as well as on the entrance to the vehicular access stops both robots. The monitoring devices are to be linked by a control unit that is to ensure both robots operate safely.

Implementation

The Flexi Soft safety controller meets these requirements intelligently and easily. It secures the two robot working areas independent of each other. The safety laser scanner can also monitor a simultaneous protective field. Using its EFI function (Enhanced Function Interface), the Flexi Soft can evaluate the two protective fields independent of each other. As a result the Flexi Soft only monitors the access to a robot if the robot is in operation. The logical configuration of the Flexi Soft modular safety controller using intuitive software with a graphical

Application overview

Task	Safety automation, hazardous area protection
Industrial sector	Assembly, handling, robotics, automation
Application location/type of machine	Robot station
Safety functions	Safe gate function, emergency stop function, reset/restart, tool/machine protection
Product family	Flexi Soft, ES21, S3000, i17S



user interface makes it possible to design the application with complete flexibility.

The contacts on the emergency stop pushbuttons and safety switches, dual-channel in each case, are monitored for cross-circuits. It is possible to monitor (external device monitoring) the safety relays connected to the outputs.

The flexibility and easy usage of the system makes it possible to realise

the application quickly and easily. The circuit configuration can also be modified and expanded at any time. This action can be undertaken straightforwardly in the safety controller with the aid of an intuitive function block-based logic editor. Additional devices such as a safety command device for safely setting up the system can be connected using expansion modules. The Flexi Soft system can be expanded to up to 144 inputs/outputs.



Overview

Products

Services & Support

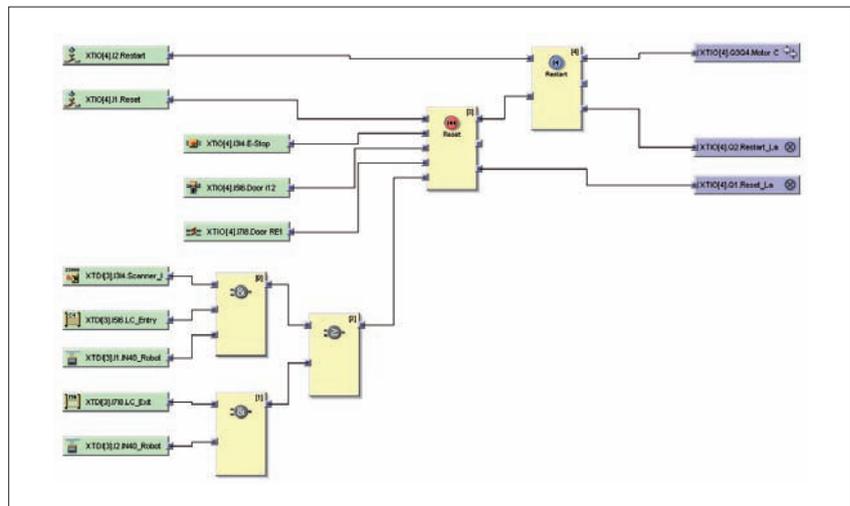
Applications in detail

Product selection

Customer benefits

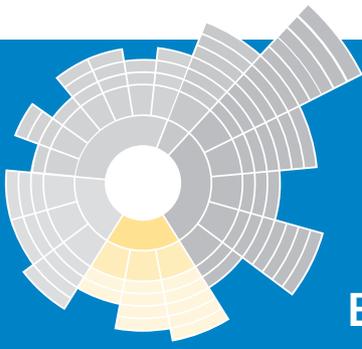
- Direct sensor connection
- Fast response times
- Space saving
- Logic configuration as required via software
- Usage of the expanded sensor functions by means of the EFI
- Optional diagnosis module
- Modular construction: The controller grows with the application
- Easy field bus connection via diagnosis modules

Flexi Soft Designer logic configuration: a simple and efficient tool for the configuration



Flexi Soft sensor configuration: sensor configuration via drag and drop





Efficient solutions even for larger tasks

Hazardous point protection for material feed on a rotary table

Application Finder
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Application description

Parts for tools are placed manually in the recesses on a rotary table. After the rotation of the table, a robot processes the parts and then places them on a conveyor belt for further production steps. This process is repeated continuously. For the protection of the tool, it must be ensured that the rotary table is in the correct position.

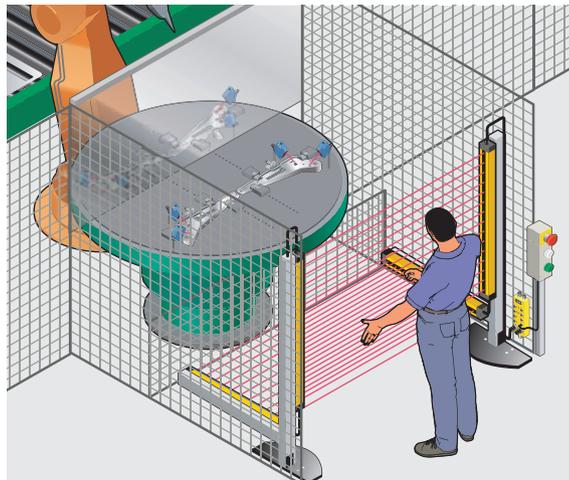
Implementation

The logic for the application is defined directly on site at the rotary table by the linking of inputs and outputs on certified function blocks in the UE4457 remote controller. The UE4457 remote controller can either be operated as an isolated controller or in a network. As an electro-sensitive protective device for the protection of people, the C4000 safety light curtain stops the movement of the rotary table if a person reaches into the protective field. The protective field height prevents reaching into the hazardous area. A second horizontal light curtain, cascaded with the vertical C4000, protects against standing behind the protective device.

The "PSDI mode" function in the controller initiates the rotary movement of the table and in this way ensures rapid and efficient work at the insertion station. This feature increases productivity and provides the operator with optimal protection at the workplace.

Application overview

Task	Hazardous point protection
Industrial sector	Machine tools and production systems
Application location/type of machine	Rotary table
Safety functions	Integration of safe automation in control system on same network, emergency stop function, safe position monitoring, safety-related stop function, control modes and operating mode selection, machine control (e.g. PSDI)
Product family	UE4457, C4000, IN4000



Safety position switches or a wear-free IN4000 non-contact safety switch detect the position of the rotary table. The non-contact safety switch is evaluated directly in the remote controller without any further evaluation unit. A control device with emergency stop pushbutton, reset button and start button with LED indicators rounds off the safety con-

cept. The components are connected directly at the insertion station to a UE4457 safety remote controller and evaluated.



Overview

Products

Services & Support

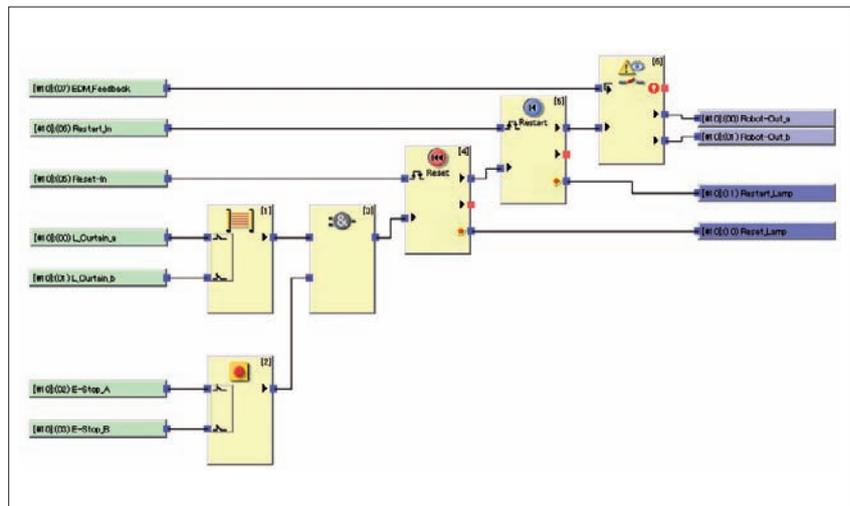
Applications in detail

Product selection

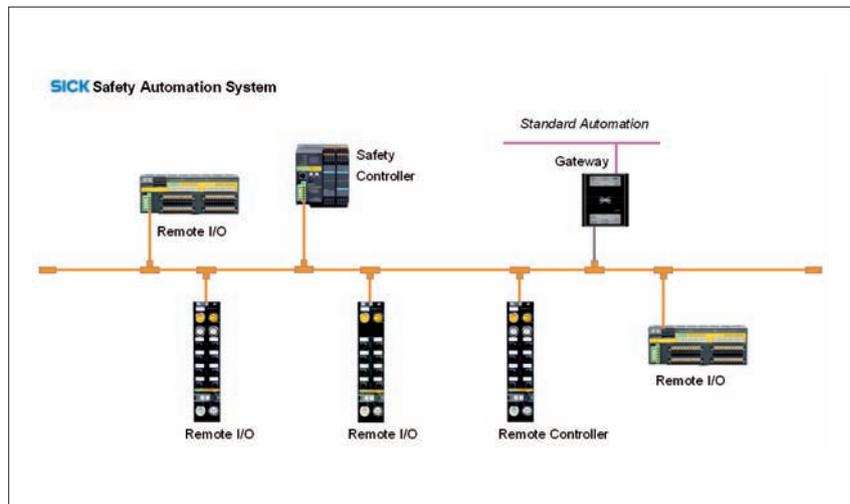
Customer benefits

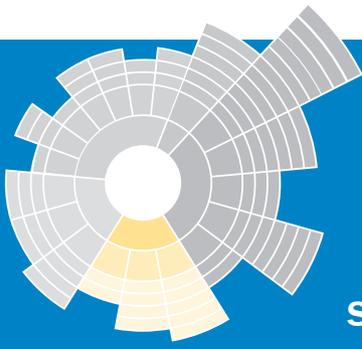
- Optimally matched system components permit the best possible solutions
- Minimisation of the safety distances due to fast system response times and Fast-Shut-off functionality
- Cost saving due to reduced wiring effort and shorter commissioning
- UE4457 permits both stand-alone safety solutions and also subsequent integration into network solutions

The safety functions are realised simply and conveniently with the aid of certified function blocks. The graphical programming provides not only clear information, but at the same time also automatic, complete documentation. In the online monitoring mode the current state of the inputs and outputs as well as the results of the logic can be displayed in colour at any time.



The UE4457 remote controllers acquire the signals from the switches and the optical sensors in the system directly in the field without long cable runs. The UE4470 flexible safety controller flexibly processes the signals and controls the various cut-off paths.





sens:Control – Selection Guide

1 Designing your Safety Application

Please define the number of components required for your application.

COMPONENTS

2 Product Selection www.sens-control.com

Please define the number of required in- and outputs.

IN- AND OUTPUTS

Please define the level of the logical functionality.

LOGICAL FUNCTIONALITY

Do you intend to use the EFI (Enhanced Function Interface) functionality?

USING OF EFI (ENHANCED FUNCTION INTERFACE) FUNCTIONALITY

How do you intend to integrate your safety system into your standard automation? Are you using bus systems?

SYSTEM INTEGRATION

3 Engineering, Configuration and Commissioning

Configuration of the safety control solution with following tool:

CONFIGURATION TOOL



Overview

Products

Services & Support

Applications in detail

Product selection

EMERGENCY STOP	SAFEGUARDED DOORS	OPTICAL SAFETY SENSORS	ACTUATORS (SWITCH-OFF PATHS)
			

SAFETY RELAYS	FLEXI CLASSIC	FLEXI SOFT	NETWORK SOLUTIONS
			
	 ... 	 ... 	 ... 
Via external wiring	 ... 	 ... 	 ... 
Not available	Not available		
Via auxiliary contacts			 + 

SAFETY RELAYS	FLEXI CLASSIC	FLEXI SOFT	NETWORK SOLUTIONS
			

FACTORY AUTOMATION

With its intelligent sensors, safety systems, and auto ident applications, SICK realises comprehensive solutions for factory automation.

- Non-contact detecting, counting, classifying, and positioning of any types of object
- Accident protection and personal safety using sensors, as well as safety software and services



LOGISTICS AUTOMATION

Sensors made by SICK form the basis for automating material flows and the optimisation of sorting and warehousing processes.

- Automated identification with bar code and RFID reading devices for the purpose of sorting and target control in industrial material flow
- Detecting volume, position, and contours of objects and surroundings with laser measurement systems



PROCESS AUTOMATION

Analyzers and Process Instrumentation by SICK MAIHAK provides for the best possible acquisition of environmental and process data.

- Complete systems solutions for gas analysis, dust measurement, flow rate measurement, water analysis or, respectively, liquid analysis, and level measurement as well as other tasks



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