

AS-Interface Safety at Work



Preface



Heinz Schmersal and Philip Schmersal
Managing associates

The Schmersal Group is known worldwide for its extraordinarily comprehensive program of safety switchgear. Safety - or machinery safety to be more precise - has been our competence for decades.

The word "security" is derived from the Latin word "securus", which originally meant "without worries" („sine cura"). This is also the guideline for our daily business, from research and development to product management, sales and external sales. Not only the machinery user should have nothing to worry about, also the customers from the Schmersal Group in general should not worry about the safety of their machinery and plants. We provide you with comprehensive consultancy and determine together with you, what you need to meet the requirements of the harmonised directives and standards. Always with the same target: providing the required safety as well as the highest possible level of productivity.

We apply this concept worldwide - in more than 50 nations. The high amount of customer-specific series and variations demonstrate how seriously we are taking our mission to provide the optimal solution for each application. As a medium-sized, owner-managed company we are sufficiently flexible to put this ambition into practice - day after day - in the most different fields of application. To abbreviate: we supply safe solutions for your industry!

In order to enable us to provide you worldwide as soon as possible with these solutions, we have set up a production network featuring six production plants located on three continents. Anywhere where needed, our service and consultancy services are at your disposal.

In this brochure, we present you our new switchgear and new series, but also with a brand new concept. Based upon a wide range of safety switchgear with integrated AS-Interface Safety at Work Interface, we offer you a complete safety system, connecting all safety-related switchgear to the safety controller and the controller is able to communicate with the higher-level control systems. The system can be wired to all commonly available field bus systems and can be operated as separate or integrated safety solutions. To us, safety solution means that we supply all the individual components to you, not just safety switchgear, master-monitor combinations and Safety Gateways, but also bus distributors and even the necessary cables. In this way, we offer you an efficient and flexible basis for safe automation technology - from a single source by the experts in machinery safety.

Kind regards

Heinz Schmersal

Philip Schmersal

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The SCHMERSAL system

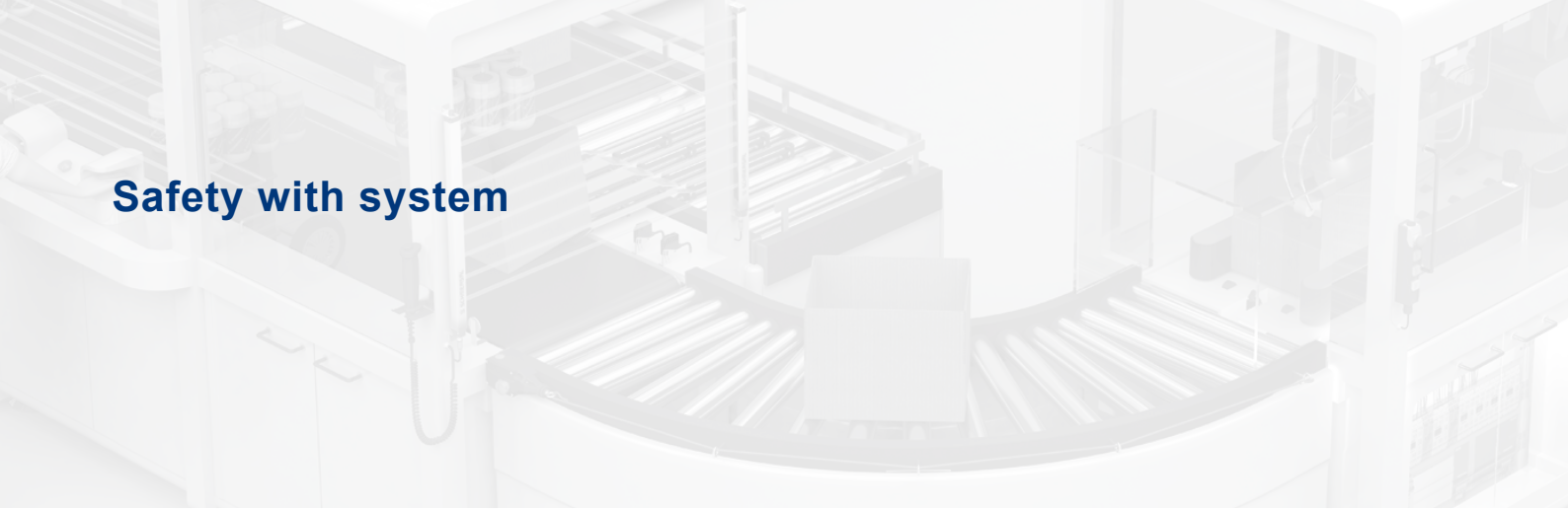
The advantages in a few words

- Individually scalable safety solutions for different machine sizes
- Smooth, fail-safe installation and interface connection of the safety switchgear through AS-Interface
- Comfortable configuration of the safety solution through the "ASIMON" Drag & Drop software
- Complete diagnostics of the entire safety circuit and all connected safety switchgear by the control system
- High operational safety through individually configurable safety-monitoring modules with multiple filter functions, e.g. for bouncing safety guards



- The safety functions can be smoothly changed or extended at a later date.
- Cost-advantageous vis-à-vis parallel wiring already as of approx. six switchgear with 6 m connecting cable each
- Individual consultancy for tailor-made systems by the Application Engineering from Schmersal
- Complete solutions including all accessories





Safety with system

Safety with system:

This is in a few words the basic idea behind the Schmersal System. This system has a simple structure: at field level, safety switchgear with integrated „AS-Interface Safety at Work“ (AS-i Safety) interface are used. They are wired to a master-monitor combination or Safety Gateway modules, which can process up to 60 safe dual-channel input and output signals, through the cost-efficient installation system AS-Interface. The status and diagnostic signals can be processed by higher-level control systems and from there on transmitted to control or visualisation systems.

The user can decide between two basic concepts.

Safety Separated ...

Many machinery builders also like to use uniformly structured safety circuits for different operational PLC systems. Therefore, they prefer a safety control system, which is separated from the normal control system. For this "Safety Separated" concept, the Schmersal System offers master-monitor combinations with different field bus interfaces. The entire safety logic is programmed using the easy-to-use ASIMON software in the safety monitors.

Three solutions are available:

- for one AS-i circuit with up to 30 safe inputs/outputs
- for two AS-i circuits with up to 60 safe inputs/outputs
- for a safe cross-communication between up to 31 master-monitor combinations and therefore for more than 1,000 safe inputs/outputs

Through the conventional field bus interfaces PROFIBUS, PROFINET, EtherNet/IP or ModbusTCP, the master-monitor combinations with the normal PLC to transmit the non-safety-related status and diagnostic signals. The entire integration of the safety control system simplifies the diagnostics and reduces the standstill times in case of failures.

... or Safety Integrated?

The Schmersal System also includes Safety Gateways, which can be directly connected to safety control systems with safe field bus. They are designed for two AS-i circuits and transmit up to 60 safe inputs/outputs to the safety control system through a safe field bus. The operational, diagnostic-relevant signals are also transmitted to the higher-level control system, where they can be accordingly processed. A pre-processing of the safe signals in the Safety Gateway is also enabled through the ASIMON Software.

A complete programme

With the Schmersal System, the machine builder has complete solutions for machinery safety from a single source.

For both concepts - either Safety Separated or Safety Integrated - multiple master-monitor combinations or Safety Gateways for the commonly used field bus systems are available.

The basic solution for Safety Separated is a master-monitor combination for the input/output link of the safety circuit to the control system. This is a field bus-independent solution for safety circuits with up to eight safety switchgear and two safe outputs.



In addition to that, the Schmersal System programme includes other monitoring-modules, such as safe speed monitoring, safe input and output modules, repeaters as well as a comprehensive range of accessories (bus distributors, power supply units, bus cables, M12 connecting cables...).

The offer of the solution also includes the consultancy during the system set-up by the Application Engineers from the Schmersal Group as well as support during the commissioning of the plants.

AS-i Safety as basis

The basis of the Schmersal System are the tried-and-tested safety switchgear with integrated AS-i safety interface. All essential ranges of the Schmersal programme are available with AS-i nodes - for instance:

- Safety switch
- Solenoid interlocks
- Safety sensors
- Emergency stop button
- Control panels
- Pull-wire emergency stop switches
- Safety foot switches.

If the desired safety switchgear is not available with integrated AS-i Safety interface, it can be simply integrated into the AS-i Safety circuit through an external input module.

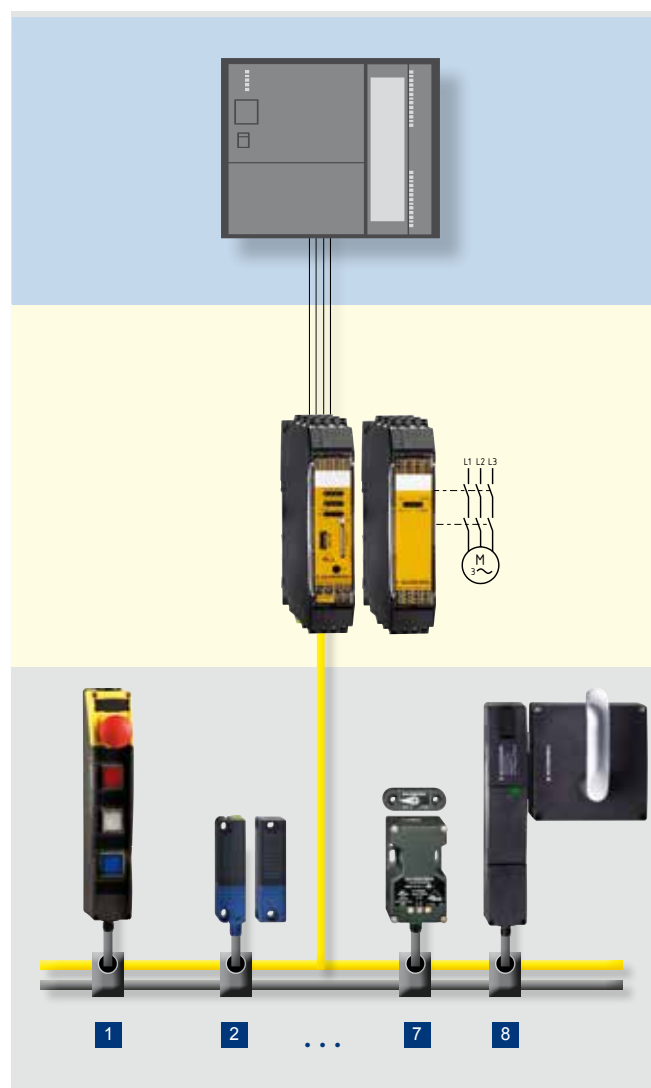
Solutions Variations

Safety Separated

- 5 master-monitor combination variants

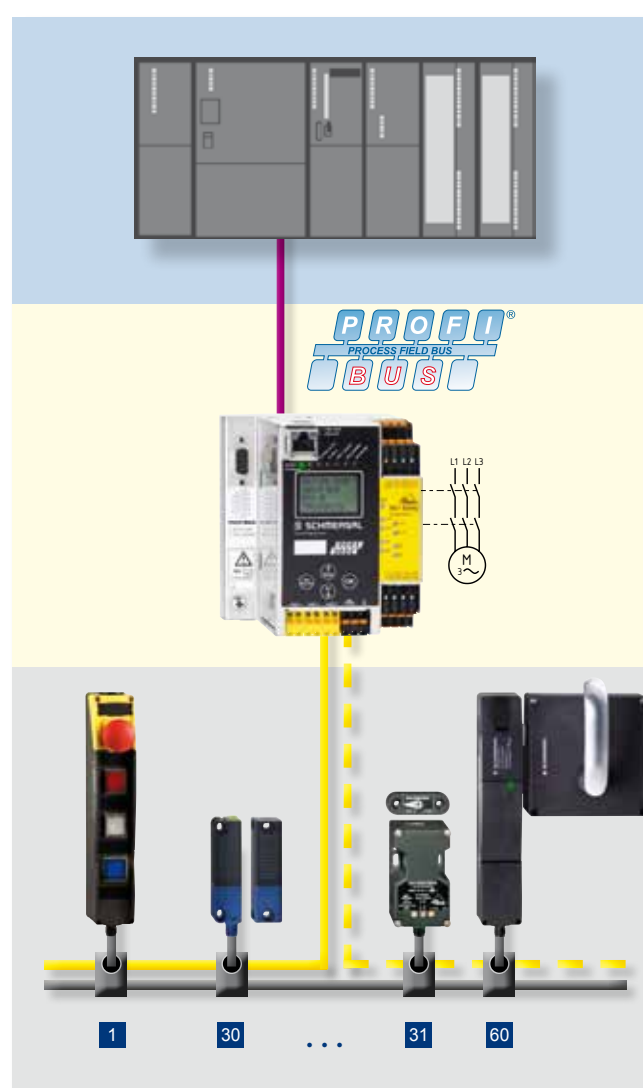
Compact safety solution with input/output connection:

- Input/output coupling of the safety circuit to the normal control system (PLC)
- 1 AS-i Master and 1 monitor
- up to 8 safe dual-channel inputs and outputs



Independent safety solution with normal field bus:

- PROFIBUS coupling of the safety circuits to the normal control system (PLC)
- 1 or 2 AS-i masters and 1 double monitor
- up to 60 safe dual-channel inputs and outputs

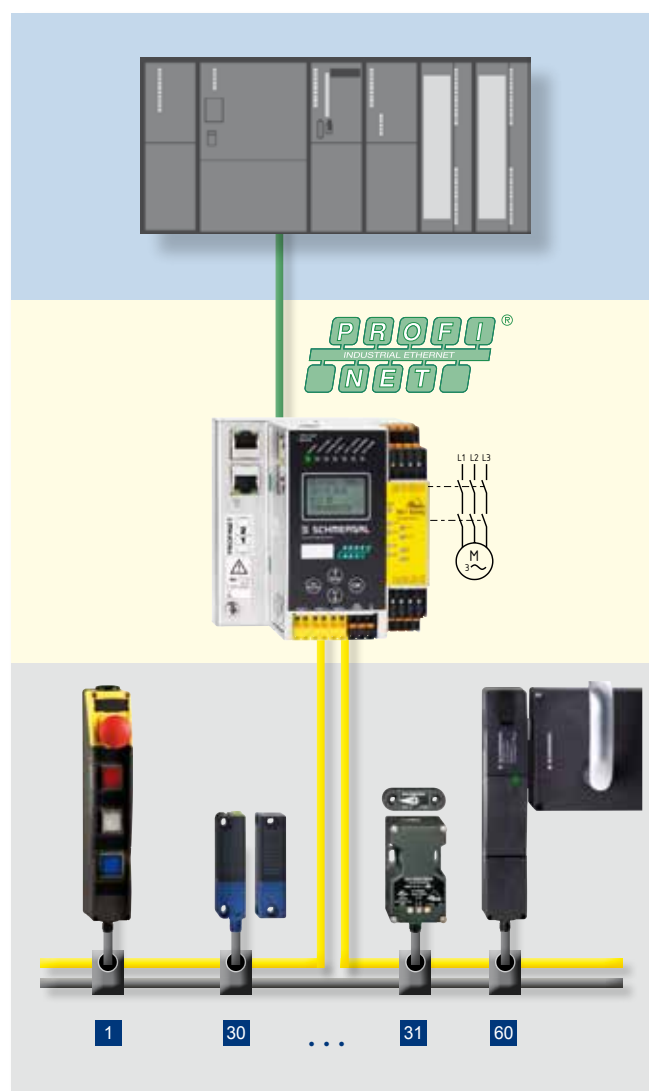


Solutions Variations

Safety Separated

Independent safety solution with normal field bus:

- PROFINET coupling of the safety circuits to the normal control system (PLC)
- 2 AS-i masters and 1 double monitor
- up to 60 safe dual-channel inputs and outputs



Independent safety solution with normal field bus:

- EtherNet/IP coupling of the safety circuits to the normal control system (PLC)
- 2 AS-i masters and 1 double monitor
- up to 60 safe dual-channel inputs and outputs



Solutions Variations

Safety Integrated

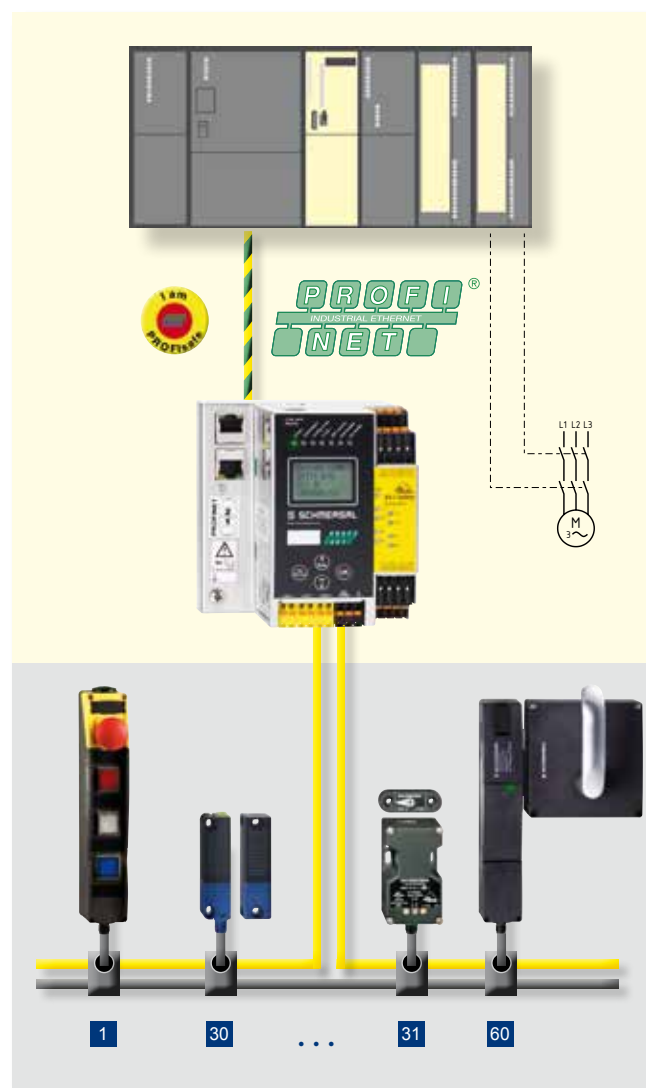
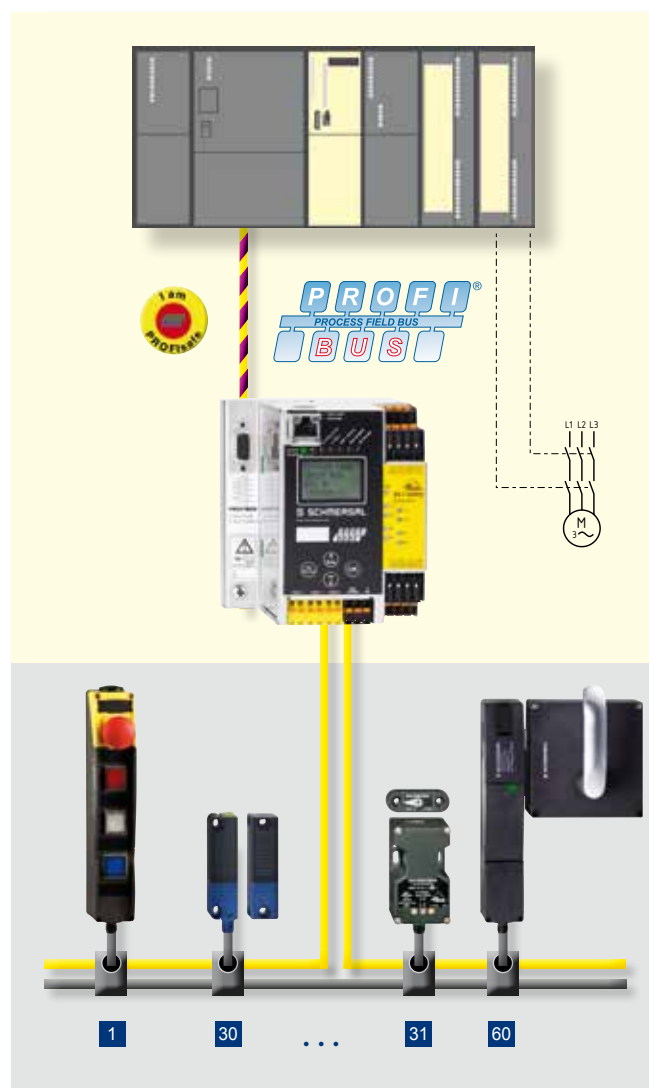
■ 2 Safety Gateway variants:

Integrated safety solution with safe field bus:

- PROFIBUS / PROFI-safe coupling with the safety control system (F-CPU)
- 2 AS-i masters and 1 double monitor
- up to 60 safe dual-channel inputs and outputs

Integrated safety solution with safe field bus:

- PROFINET / PROFI-safe coupling with the safety control system (F-CPU)
- 2 AS-i masters and 1 double monitor
- up to 60 safe dual-channel inputs and outputs



The Schmersal system

Simple, safe, flexible



Fast mounting, smooth installation

The Schmersal System enables fast mounting and installation of the components in the safety circuit. Through the yellow AS-i dual-wire profile cable, the safety switchgear are connected to each other as well as to the AS-i master and the safety monitor. The voltage is also supplied through the AS-i profile cable.

For AS-i slaves with higher power requirements, the black profile cable with 24 VDC auxiliary voltage is available. Safe and operational slaves can be controlled and evaluated through a master module. The safety functions are smoothly configured in the AS-i safety monitor through the ASIMON software.

Flexible use

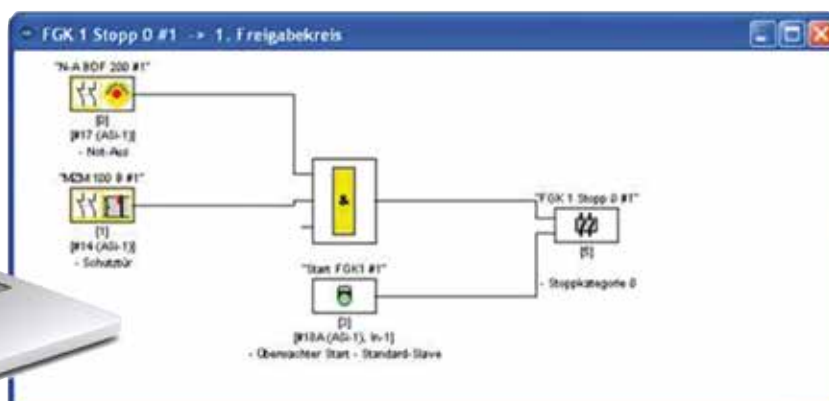
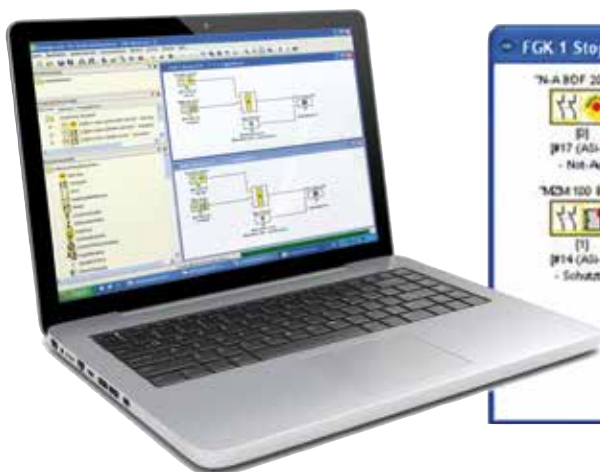
Once installed, the Schmersal System can be modified and extended at all times. This applies both to the extension with additional safety switchgear and to the configuration of the switchgear (e.g. safety links, STOP category, filter times, etc.).

A tried-and-tested "multilingual" system

With over 1.5 millions of safety switchgear in the field, AS-i Safety is the most successful safety bus in the world. In addition to the smooth interface connection and configuration, the fact that AS-Interface can communicate with all conventional and commonly used bus systems, has considerably contributed to this success. For the user of the Schmersal System, this means that his system speaks many languages - for instance: PROFIBUS, PROFINET, EtherNet/IP and ModbusTCP. Solutions for the field busses can be offered as well: DeviceNet, CC-Link, CANopen, EtherCAT and sercos III. In this way, a universal application through different communication standards is enabled.

An economic solution - also for smaller machines

When does the installation of the Schmersal System generate return on investment? When purely considering the costs, cost advantages are already generated - depending on the application - as of six safety switchgear with 6 m connecting cable each - compared to the parallel wiring. In addition to that, there are advantages, which cannot be directly included in the cost savings. These advantages include the smooth extension possibilities, the increased flexibility for making changes to the safety circuit afterwards and the clearly enhanced diagnostic possibilities. Also the comfortable configuration through the safety monitor is an advantage, which is already featured by the smallest Schmersal System.



System components

Master monitor combination

ASMM-1M-IO-SS



I/O-Interface

- AS-i Master integrated
- I/O connection to PLC
- Integrated safety monitor, 128 devices
- Antivalent switch for local inputs
- Standstill monitor through local inputs
- AS-i power supply decoupling 0.5 A integrated: for operation with normal power supply unit and AS-i Power 24
- Diagnostic interface: USB 2.0, Micro USB
- Controls up to 8 enabling circuits - 2 enabling circuits with semi-conductor outputs 24 V / 0.7 A DC integrated

ASMM-1M-PB-R2R2



PROFIBUS

- AS-i Master integrated
- Field bus gateway: PROFIBUS DP
- Integrated safety monitor for 2 AS-i circuits, 256 devices
- AS-i power supply decoupling 4 A integrated: for operation with normal power supply unit and AS-i Power 24
- Diagnostic interface: Ethernet RJ-45
- Controls up to 16 enabling circuits - 2 enabling circuits with 2 relay contacts each 30 V / 3 A AC/DC integrated

ASMM-2M-PB-RRSS



PROFIBUS

- 2 AS-i Master integrated
- Field bus gateway: PROFIBUS DP
- Integrated safety monitor for 2 AS-i circuits, 256 devices
- Integrated 2-fold AS-i power supply decoupling with 2 x 4 A; 1 power supply unit for 2 AS-i circuits possible
- Diagnostic interface: Ethernet RJ-45; safe cross-communication with multiple devices possible; integrated web server
- Controls up to 32 enabling circuits
 - 2 enabling circuits with relay contacts 30 V / 3 A AC/DC integrated
 - 2 enabling circuits with semi-conductor outputs 30 V / 0.5 A DC integrated

System components

Master monitor combination

ASMM-2M-PN-RRSS



PROFINET

- 2 AS-i Master integrated
- Field bus gateway: PROFINET 10/100 MBaud
- Integrated safety monitor for 2 AS-i circuits, 256 devices
- Integrated 2-fold AS-i power supply decoupling with 2 x 4 A; 1 power supply unit for 2 AS-i circuits possible
- Diagnostic interface: RS 232, alternatively through PROFINET connection; safe cross-communication with multiple devices possible; integrated web server
- Controls up to 32 enabling circuits
 - 2 enabling circuits with relay contacts 30 V / 3 A AC/DC integrated
 - 2 enabling circuits with semi-conductor outputs 30 V / 0.5 A DC integrated

ASMM-2M-EIP-MT-RRSS



EtherNet/IP and ModbusTCP

- 2 AS-i Master integrated
- Field bus gateway: EtherNet/IP and Modbus TCP
- Integrated safety monitor for 2 AS-i circuits, 256 devices
- Integrated 2-fold AS-i power supply decoupling with 2 x 4 A; 1 power supply unit for 2 AS-i circuits possible
- Diagnostic interface: RS 232, alternatively through PROFINET connection; integrated web server
- Controls up to 16 enabling circuits
 - 2 enabling circuits with relay contacts 30 V / 3 A AC/DC integrated
 - 2 enabling circuits with semi-conductor outputs 30 V / 0.5 A DC integrated

ASRE-2R-R4R4



Output expander module

- Contact extension for semi-conductor safety outputs
- Integrated contact kit for feedback loop (EDM)
- Relay contact extension for 2 enabling circuits:
 - 2 enabling circuits with 4 relay contacts each 230 V / 3 A AC/DC integrated

System components

Safety Gateways

ASSG-2M-PB-RRSS



PROFIBUS with PROFIsafe

- 2 AS-i Master integrated
- Field bus gateway: PROFIBUS DP with PROFIsafe
- Optional safety monitor for 2 AS-i circuits, 256 devices
- Integrated 2-fold AS-i power supply decoupling with 2 x 4 A; 1 power supply unit for 2 AS-i circuits possible
- Diagnostic interface: Ethernet RJ-45; integrated web server
- Controls up to 64 enabling circuits
 - 2 enabling circuits with relay contacts 30 V / 3 A AC/DC integrated
 - 2 enabling circuits with semi-conductor outputs 30 V / 0.5 A DC integrated

ASSG-2M-PN-RRSS



PROFINET with PROFIsafe

- 2 AS-i Master integrated
- Field bus gateway: PROFINET 10/100 MBaud with PROFIsafe
- Optional safety monitor for 2 AS-i circuits, 256 devices
- Integrated 2-fold AS-i power supply decoupling with 2 x 4 A; 1 power supply unit for 2 AS-i circuits possible
- Diagnostic interface: RS 232, alternatively through PROFINET connection; integrated web server
- Controls up to 64 enabling circuits
 - 2 enabling circuits with relay contacts 30 V / 3 A AC/DC integrated
 - 2 enabling circuits with semi-conductor outputs 30 V / 0.5 A DC integrated

System components

Safety Monitors

ASM G2-R2/R2



Safety monitor, up to 16 enabling circuits

- Safety monitor for 2 AS-i circuits, 256 devices
- LCD diagnostic display with 4 menu buttons
- Diagnostic interface: Ethernet RS 232
- Controls up to 16 enabling circuits - 2 enabling circuits with 2 relay contacts each 30 V / 3 A AC/DC integrated

ASM E2-R2/R2



Safety monitor, 2 enabling circuits

- Safety monitor for 1 AS-i circuit, 48 devices
- Diagnostic interface: RS 232 through RJ-45
- Controls 2 enabling circuits:
 - 2 enabling circuits with 2 relay contacts each 24 V / 1 A DC integrated and 230 V / 3 A AC integrated

ASM E1-R2



Safety monitor, 1 enabling circuit

- Safety monitor for 1 AS-i circuit, 48 devices
- Diagnostic interface: RS 232 through RJ-45
- Controls 1 enabling circuit:
 - 1 enabling circuit with 2 relay contacts each 24 V / 1 A DC integrated and 230 V / 3 A AC integrated

System components

Safety speed monitoring

ASSM-2A-SINCOS



Speed monitoring for 2 axes

- Safety speed monitoring for 2 axes
- Sin/Cos generator can be connected
- Integrated safety function per axis:
 - Safe stop
 - Safe speed
 - Safe rotational direction "Right"
 - Safe rotational direction "Left"
- Max. 4 safety addresses per axis
- Multiple monitoring functions can be combined in one safety address
- DIN rail mounting, protection class IP20

ASSM-2A-HTL



Speed monitoring for 2 axes

- Safety speed monitoring for 2 axes
- HTL and 24 V generator can be connected
- Integrated safety function per axis:
 - Safe stop
 - Safe speed
 - Safe rotational direction "Right"
 - Safe rotational direction "Left"
- Max. 4 safety addresses per axis
- Multiple monitoring functions can be combined in one safety address
- DIN rail mounting, protection class IP20

System components

Safety I/O-Modules

ASOM-1SO-R2



Safety-Output

- Safety output module with diagnostic slave
- Integrated diagnostic slave (A/B):
 - 1 integrated EDM input, supplied by AS-i
 - 3 integrated spare inputs, supplied by AS-i
- Integrated safety output with 1 enabling circuit:
 - 1 enabling circuit with 2 relay contacts 30 V / 3 A DC and 230 V / 3 A AC
- DIN rail mounting, protection class IP20

ASIM-1SI-C



Safety input, contacts

- Safety input module with 2 standard outputs
- Suitable for galvanically free contacts (NC/NC)
- Integrated cross-wire short detection with reporting through parameter & FID
- 2 integrated standard outputs
 - 2 integrated semi-conductor outputs 24 V / 0.2 A DC
- DIN rail mounting, protection class IP20

ASIM-1SI-S



Safety input, OSSD

- Safety input module with 2 standard outputs
- Suitable for OSSD outputs of safety switchgear
- 2 integrated standard outputs
 - 2 integrated semi-conductor outputs 24 V / 0.5 A DC
- DIN rail mounting, protection class IP20

System components

AS-i power supply units

ASPS-1800



Power supply 1.8 A

- AS-interface power supply unit
- 105 - 250 V AC, wide-range input
- 1.8 A / 40° C and 1.0 A / 55° C
- DIN rail mounting, protection class IP20

ASPS-4000



Power supply 4 A

- AS-interface power supply unit
- 100 - 240 V AC, wide-range input
- 4.0 A / 55° C
- DIN rail mounting, protection class IP20

ASPS-8000



Power supply 8 A

- AS-interface power supply unit
- 115 V AC or 230 V AC, switchable
- 8.0 A / 55° C
- DIN rail mounting, protection class IP20

System accessories

Bus accessories

ASLT-200



AS-i line termination

- Passive AS-i bus termination for cable extension
- Extends the AS-i network for approx. 200 m at the most
- Integrated diagnostic function:
 - Green diagnostic LED: U-AS-i > 26.0 V
 - Yellow diagnostic LED: U-AS-i > 18.5 V
- AS-i bus termination in field enclosure (plug), protection class IP65

ASAR-300-LT



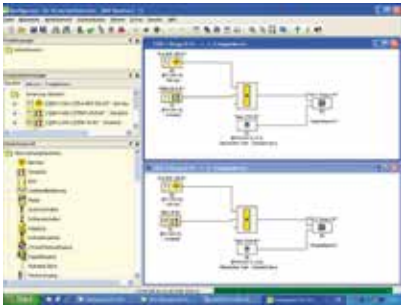
AS-i Repeater

- Advanced repeater with switchable passive bus termination
- Bus termination extends the AS-i network segment A for approx. 200 m at the most
- Repeater function with galvanic separator from segment A to segment B
- 4 diagnostic displays segment A:
 - PWR, FAULT, U-AS-i > 26.0 V, U-AS-i > 18.5 V
- 2 diagnostic displays segment B:
 - PWR, FAULT

System accessories

Programming accessories

ASM G2 CD



ASIMON Software

- Configuration software for all monitors
- Smooth Drag & Drop configuration of the safety functions
- Representation of the configuration as functional plan (FUP)
- Comprehensive functional modules available:
 - Monitoring modules for different safety switchgear
 - Filter functions for bouncing safety guards
 - Integrated muting function module
 - START modules
 - STOP 0 and STOP 1 modules
 - EDM modules
- Compatible with Microsoft® Windows 2000/XP/Vista/7

ASPC-USB



USB programming cable

- ASIMON PC programming cable
- USB Type A – Micro USB
- For ASMM-1M-IO-SS

ASM G2 CC



RS232 programming cable

- ASIMON PC programming cable
- D-Sub 9-poles - Mini-DIN 6 poles
- For ASMM-2M-PN-RRSS / ASMM-2M-EIP-MT-RRSS
- For ASSG-2M-PN-RRSS
- For ASM G2-R2/R2

ASPC-RJ45



RJ45 programming cable

- ASIMON PC programming cable
- RJ-45 cross cable
- For ASMM-1M-PB-R2R2 / ASMM-2M-PB-RRSS
- For ASSG-2M-PB-RRSS

System accessories

Programming accessories

ASHH-1-V30



Manual addressing unit

- AS-Interface, hand held, AS-i Spec 3.0
- Addressing and parameter setting of AS-Interface slaves
- Slave profile can be read out
- Slave connection short-circuit and overload-proof
- Battery charger included in delivery

ASIC-USB-COM



USB to COM converter

- USB - COM (RS232) interface converter
- USB 2.0, > 1 Mbps
- For devices with RS 232 diagnostic interface

ASMC-32K



Chip card

- 32 Kbyte chip card for:
 - Master-monitor combinations
 - Safety Gateways
 - Safety Monitor G2
 - Safety speed monitoring

Safety switchgear

Safety sensors

RSS 36 AS



Switching distance 10 mm, IP69K

- Electronic safety sensor
- Repeated universal or individual coding
- Enhanced protection against tampering through RFID technology
- Optionally with integrated magnetic latching
- Suitable for applications
 - up to PL e / category 4 to EN ISO 13849-1
 - and SIL 3 to IEC 61508
- Protection class IP69K
- Dimensions: 107 mm × 25 mm × 22 mm

Code number: C-84RSS3

BNS 260 AS



Switching distance 5 mm

- Magnetic safety sensor
- Coded actuator
- Suitable for applications
 - up to PL e / category 4 to EN ISO 13849-1
 - and SIL 3 to IEC 61508
- Protection class IP67
- Dimensions: 36 mm × 26 mm × 13 mm

Code number: C-67BNS2

Safety switchgear

Safety sensors

BNS 36 AS



Switching distance 7 mm

- Magnetic safety sensor
- Coded actuator
- Suitable for applications
 - up to PL e / category 4 to EN ISO 13849-1
 - and SIL 3 to IEC 61508
- Protection class IP67
- Dimensions: 88 mm × 25 mm × 13 mm

Code number: C-81BNS3

BNS 16 AS



Switching distance 8 mm

- Magnetic safety sensor
- Coded actuator
- Suitable for applications
 - up to PL e / category 4 to EN ISO 13849-1
 - and SIL 3 to IEC 61508
- Protection class IP67
- Dimensions: 52 mm × 90 mm × 39 mm

Code number: C-43BNS1

Safety switchgear

Solenoid interlocks

MZM 100 AS



Holding force 750 N

- Unique non-contacting and magnetic operating principle
- Solenoid interlock in 2 variants:
 - MZM 100 ST-AS
 - Enabling signal when guard is locked
 - MZM 100 BT-AS
 - Enabling signal when guard is closed
- Suitable for applications
 - up to PL e / category 4 to EN ISO 13849-1
 - and SIL 3 to IEC 61508
- Protection class IP67
- Dimensions: 40 mm × 179 mm × 40 mm

Code number: C-47MZM1

AZM 200 AS



Holding force 2000 N

- Solenoid interlock in 3 variants:
 - AZM 200 ST-T-AS
 - Enabling signal when guard is locked
 - AZM 200 B ST-T-AS
 - Enabling signal when guard is closed
 - AZM 200 BZ ST-T-AS
 - Enabling signal AS-i half code 1, when guard is closed
 - Enabling signal AS-i half code 2, when guard is locked
- Suitable for applications
 - up to PL e / category 4 to EN ISO 13849-1
 - and SIL 3 to IEC 61508
- Protection class IP67
- Dimensions: 40 mm × 244 mm × 50 mm

Code number: C-67AZM2

Safety switchgear

Solenoid interlocks

AZM 161 AS (I)



Holding force 2000 N, optionally with individual coding

- Solenoid interlock in 3 variants:
 - AZM 161 ST-AS
 - Enabling signal when guard is locked
 - AZM 161 B ST-AS
 - Enabling signal when guard is closed
 - AZM 161 BZ ST-AS
 - Enabling signal AS-i half code 1, when guard is closed
 - Enabling signal AS-i half code 2, when guard is locked
- Suitable for applications
 - up to PL d / category 3 to EN ISO 13849-1
 - and SIL 2 to IEC 61508
- Protection class IP67
- Dimensions: 130 mm × 90 mm × 30 mm

Code number: C-44AZM1

AZM 170 AS



Holding force 1000 N

- Solenoid interlock in 2 variants:
 - AZM 170 B ST-AS
 - Enabling signal when guard is locked
 - MZM 170 BZ ST-AS
 - AS-i half code 2, when guard is closed
 - AS-i half code 1, when guard is locked
- Suitable for applications
 - up to PL d / category 3 to EN ISO 13849-1
 - and SIL 2 to IEC 61508
- Protection class IP67
- Dimensions: 90 mm × 76 mm × 30 mm

Code number: C-74AZM1

Safety switchgear

Safety switch

AZ 200 AS



Design 2, electronic

- Safety switch with separate actuator
- The sensor technology allows for a misalignment of the actuator and the safety switch of +/- 5 mm
- Suitable for applications
 - up to PL e / category 4 to EN ISO 13849-1
 - and SIL 3 to IEC 61508
- Protection class IP67
- Dimensions: 40 mm × 244 mm × 50 mm

Code number: C-05AZ20

AZ 16 AS



Design 2, electromechanical

- Safety switch with separate actuator
- Coded actuator
- Suitable for applications
 - up to PL d / category 3 to EN ISO 13849-1
 - and SIL 2 to IEC 61508
- Protection class IP67
- Dimensions: 52 mm × 30 mm × 90 mm

Code number: C-33AZ16

Safety switchgear

Safety switch

Z/T 235 AS



11 Actuator heads

- Position switch for safety functions
- Mounting details to EN 50047
- Metal enclosure
- Wide range of alternative actuators
- Suitable for applications
 - up to PL d / category 3 to EN ISO 13849-1
 - and SIL 2 to IEC 61508
- Protection class IP67
- Dimensions: 30 mm × 64 mm × 30 mm

Code number: C-82235A

Z/T 236 AS



11 Actuator heads

- Position switch for safety functions
- Mounting details to EN 50047
- Thermoplastic enclosure
- Wide range of alternative actuators
- Suitable for applications
 - up to PL d / category 3 to EN ISO 13849-1
 - and SIL 2 to IEC 61508
- Protection class IP67
- Dimensions: 30 mm × 62 mm × 30 mm

Code number: C-22236A

Z/T 256 AS



11 Actuator heads

- Position switch for safety functions
- Mounting details to EN 50047
- Thermoplastic enclosure
- Wide range of alternative actuators
- Suitable for applications
 - up to PL d / category 3 to EN ISO 13849-1
 - and SIL 2 to IEC 61508
- Protection class IP67
- Dimensions: 58 mm × 51 mm × 31 mm

Code number: C-67256A

Detailed information about the products can be found at: www.schmersal.net below the indicated code numbers

Safety switchgear

Safety switch

Z/T 256 AS 2S



11 Actuator heads

- Variant for applications with 2 separated position switches
- Mounting details to EN 50047
- Thermoplastic enclosure
- Wide range of alternative actuators
- Suitable for applications
 - up to PL e / category 4 to EN ISO 13849-1
 - and SIL 3 to IEC 61508
- Protection class IP67
- Dimensions: 58 mm × 51 mm × 31 mm

Code number: C-38256A

T 335 AS



6 Actuator heads

- Position switch for safety functions
- Mounting details to EN 50041
- Metal enclosure
- Wide range of alternative actuators
- Suitable for applications
 - up to PL d / category 3 to EN ISO 13849-1
 - and SIL 3 to IEC 61508
- Protection class IP67
- Dimensions: 41 mm × 76 mm × 38 mm

Code number: C-48335A

T 336 AS



6 Actuator heads

- Position switch for safety functions
- Mounting details to EN 50041
- Thermoplastic enclosure
- Wide range of alternative actuators
- Suitable for applications
 - up to PL d / category 3 to EN ISO 13849-1
 - and SIL 3 to IEC 61508
- Protection class IP67
- Dimensions: 41 mm × 76 mm × 38 mm

Code number: C-74336A

Detailed information about the products can be found at: www.schmersal.net below the indicated code numbers

Safety switchgear

Safe input module

AST ... ST-AS und AST ... L-AS



Safe input module for field applications

- 2 safety inputs for contacts in the variants:
 - NC / NC combination
 - NC / NO combination
- Optionally with integrated solenoid control of solenoid interlocks
- Protection class IP67
- Dimensions: M30 x 70 mm

Code number: C-85ASTA

AST LC ST-AS



Safe input module for field applications

- 2 safety inputs for safe semi-conductor outputs:
 - for non-contact safety guards (AOPD)
 - Light grids or sensors
- BWS supply through separate M12 connection
- Protection class IP67
- Dimensions: M30 x 70 mm

Code number: C-69ASTL

Safety switchgear

Emergency stops and control panels

BDF 200 AS

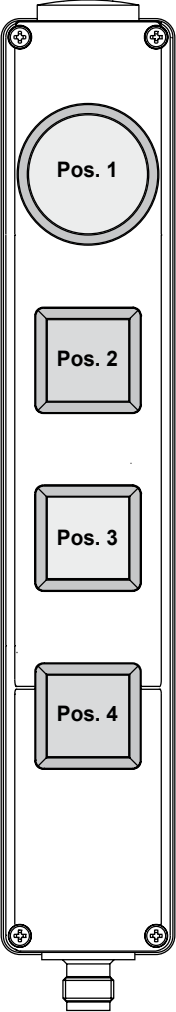


Emergency stop and 3 command and signalling devices

Control panel with emergency stop function and 3 mounting positions for command and signalling devices

- Large range of illuminated pushbuttons, selector switches, LED indicators, key-operated switches, emergency stop buttons
- Emergency-stop, start/stop and reset functions available
- Integrated AS-interface
 - Safety slave for emergency stop
 - A/B slave for command and signalling devices
- * Optionally highly-visible indicator lamp G24 (red / green)
- Protection class IP65
- Dimensions: 40 mm × 244 mm × 50 mm

Code number: C-62BDF2

Actuating elements		Pos. 1	Pos. 2	Pos. 3	Pos. 4	Control panel
	NH	•				
	NHK	•				
	LT..		•	•	•	
	LM..		•	•	•	
	DT..		•	•	•	
	SWS20 SWT20		•			
	WS20 WS30 WT20 WT30 WTS30		•			

Detailed information about the products can be found at: www.schmersal.net below the indicated code numbers

Safety switchgear

Emergency stops and control panels

NAS 311 AS



Emergency stop Station

- Integrated AS-Interface
- Thermoplastic operating element
- Pull to reset
- Protection class IP65
- Dimensions: 85 mm × 85 mm × 98 mm

Code number: C-87NAS3

Safety switchgear

Pull-wire emergency-stop switches

ZQ 900 AS



Wire up to 50 m long

- Pull-wire emergency stop switches to EN ISO 13850 / IEC 60947-5-5
- Robust metal enclosure
- Wire up to 50 m long
- Optionally with emergency-stop button
- Suitable for applications
 - up to PL e / category 4 to EN ISO 13849-1
 - and SIL 3 to IEC 61508
- Protection class IP67
- Dimensions: 72 mm × 220 mm × 70 mm

Code number: C-01ZQ90

ZQ 700 AS



Wire up to 10 m long

- Pull-wire emergency stop switches to EN ISO 13850 / IEC 60947-5-5
- Thermoplastic enclosure
- Wire up to 10 m long
- Suitable for applications
 - up to PL e / category 4 to EN ISO 13849-1
 - and SIL 3 to IEC 61508
- Protection class IP67
- Dimensions: 41 mm × 170 mm × 51 mm

Code number: C-27ZQ70

Safety switchgear

Safety foot switches

TFH 232 AS UEDR



Safety foot switches

- Robust metal enclosure
- Protective shield with wide opening
- With overlapping contacts (UE), pressure point (D) and latching (R)
- Suitable for applications
 - up to PL c / category 1 to EN ISO 13849-1
 - and SIL 1 to IEC 61508
- Protection class IP65
- Dimensions: 170 mm × 274 mm × 189 mm

Code number: C-91TFH2

Installation accessories

Passive bus distributors

ASSB-2P-1M12-V1



Flat-cable distributor AS-Interface

- M12 socket, 2-poles
- Protection class IP67
- Dimensions: 28 mm × 41 mm × 35 mm

ASSB-4P-1M12-V1



Flat-cable distributor AS-Interface and auxiliary voltage

- M12 socket, 4-poles
- Protection class IP67
- Dimensions: 28 mm × 41 mm × 35 mm

ASSB-4P-2M12-V1



Flat-cable distributor AS-Interface and auxiliary voltage

- 2 M12 sockets, 4-poles
- Protection class IP67
- Dimensions: 28 mm × 41 mm × 35 mm

ASSB-2P-FKB-V1



Flat-cable connector for 2 flat cables

- 2-pole bridge
- Protection class IP67
- Dimensions: 28 mm × 41 mm × 22 mm

ASSB-4P-SW-V1



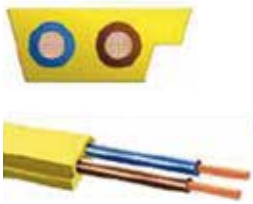
Flat-cable distributor AS-Interface and auxiliary voltage

- 4 terminals for single wires
- Protection class IP67
- Dimensions: 28 mm × 41 mm × 31 mm

Installation accessories

Bus cables and connecting cables

ASBC-FK-TPE-2X1,5-YE



AS-Interface yellow flat cable (id. RAL 1012)

- Cross section 2 x 1.5 mm²
- Tin-plated copper, extra finely stranded
- Insulation: thermoplastic elastomere (TPE)
- UL-Style 2103
- 100 m reel

ASBC-FK-TPE-2X1,5-BK



Auxiliary voltage flat cable black (id. RAL 9005)

- Cross section 2 x 1.5 mm²
- Tin-plated copper, extra finely stranded
- Insulation: thermoplastic elastomere (TPE)
- UL-Style 2103
- 100 m reel

V-SK4P-M12-...



M12 connecting cable for connecting AS-i slaves

- M12 male connector - M12 female connector, 4 poles
- PUR cable, PVC-, silicone- and halogene-free
- UL/CSA homologations
- Protection class IP67
- 5 available lengths
0.5 m, 1.0 m, 1.5 m, 2.0 m, 3.0 m

Safe solutions for your industry

Safety Services

Professional practical competence for the practice

Machinery safety is a challenging and multi-layered theme, which issues major challenges both to machine builders and safety engineers. After all, during the selection of safety systems, many directives and standards must be observed and especially the new regulations, such as:

- EN ISO 13849-1
- EN 62061
- IEC 61508

These are complex regulations, which require sufficient time and expertise to be adequately understood.

Safety Consulting: Adequate consultancy from the start

An increasing number of companies are searching for assistance and consultancy for the implementation of these regulations. With the help of experts, very specific issues can be addressed faster and safer. That is why the Schmersal Group has pooled its expertise for this kind of tasks and entrusted the "Safety Consulting" to highly qualified specialists.

The service portfolio from the "Safety Consulting" is clearly structured.

The Consultants can be consulted by the customers, amongst others, on the following problems:

- Application consultancy
- Run-on time measurement
- Risk analysis to
EN ISO 12100:2010
- Conformity assessment procedure

Of course, the Consultants will be pleased to answer questions beyond these subject areas. To that effect, they have direct access to the knowledge of the different specialist departments from the Schmersal Group, from product management to the R&D department and the standardisation, committee and association work groups.



Assistance from experts

Some thirty experienced collaborators from the Schmersal Group from eighteen countries were qualified as machine safety experts. They closely collaborate with the local sales engineers and the product management.

Comprehensive know how

When our Safety Consultants are configuring standard-compliant safety systems, they can rely on comprehensive and highly practice-oriented knowhow. The participation of the Schmersal Group in various standardisation panels provides for the necessary theoretical background, which is required for the selection or configuration of standard-compliant guard systems.

Application Centre: Service provision for the safety of man and machine

To offer our customers an even more intensive consultancy, we have established the Application Centre. In addition to the sales engineers and the technical sales, this is the field of operation of the application engineers.

For complex issues: The CE Network

In Germany the Safety Consultants closely collaborate with the CE Network, they can rely on comprehensive expert knowledge for special issues. This network of competent engineering companies, which was initiated by the Schmersal Group, provides mechanical engineers with competent advice on complex themes regarding machine safety. The CE Network has a specialist for any extraordinary problem and provides an answer to any question.

More information: www.ce-netzwerk.de

Best of MRL-News



Code number: 101215470

The Schmersal Group regularly publishes MRL-NEWS to keep machinery and plant builders up-to-date on the latest news, discussions and current issues regarding functional machinery safety.

The most important articles from these publications have been published in a book called "Best of MRL-News" and completed by up-to-date themes. You will be provided with information on the current legal matters in machinery safety as well as on the latest innovations regarding the technical development of safety components.

This 220-page illustrated book can be ordered for free from Schmersal.

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The Schmersal Group

For many years the privately owned Schmersal Group has been developing and manufacturing products to enhance occupational safety. What started out with the development and manufacture of a very wide variety of mechanical and non-contact switchgear has now become the world's largest range of safety systems and solutions for the protection of man and machine. Over 1,400 employees in more than 50 countries around the world are developing safety technology solutions in close cooperation with our customers, thus contributing to a safer world.

Motivated by the vision of a safe working environment, the Schmersal Group's engineers are constantly working on the development of new devices and systems for every imaginable application and requirement of the different industries. New safety concepts require new solutions and it is necessary to integrate new detection principles and to discover new paths for the transmission and evaluation of the information provided by these principles. Furthermore, the set of ever more complex standards, regulations and directives relating to machinery safety also requires a change in thinking from the manufacturers and users of machines.

These are the challenges which the Schmersal Group, in partnership with machinery manufacturers, is tackling and will continue to tackle in the future.

Product ranges



Safe switching and monitoring

- Guard door monitoring safety switches
- Command devices with safety function
- Tactile safety devices
- Optoelectronic safety devices

Safe signal processing

- Safety monitoring modules
- Safety controllers
- Safety bus systems

Automation

- Position detection
- Command and signalling devices

Industries



- Elevators and escalators
- Packaging
- Food
- Machine tools
- Heavy industry

Services



- Application advice
- CE conformity assessment
- Risk assessment in accordance with the Machinery Directive
- Stop time measurements
- Training courses

Competences



- Machine safety
- Automation
- Explosion protection
- Hygienic design

All data mentioned in this flyer have been carefully checked.
Technical modifications and errors excepted.

www.schmersal.com



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Safe solutions for your industry