System overview

SAFEMASTER M

The modular, software-free safety system

DOLD

Our experience. Your safety.

The software-free system

Safety-oriented control systems to evaluate safety switches and sensors as well as for the activation of actors have long been on the market. As a machine and equipment manufacturer, you are spoiled for choice. Hard wire, configure or program?

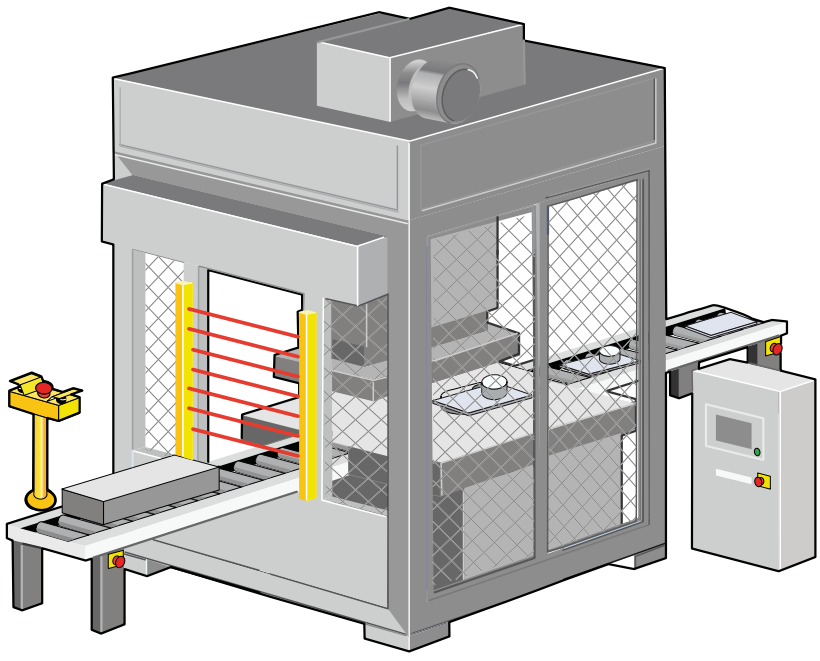
The use of programmable safety controls is not always worth it. The requirements and expenses for software specification, programming, validation and documentation cannot be overlooked.

DOLD offers an interesting alternative with the multifunctional safety system SAFEMASTER M, just for smaller to medium sized facilities. Safety requirements are implemented quickly and easily through the software-free configuration.

The SAFEMASTER M safety system is suitable for use in safety applications ranging up to cat. 4 / PL e acc. to EN ISO 13849-1 and SIL 3 acc. to IEC/EN 61508.

Your advantages at a glance:

- **Multifunctional, modular, freely configurable**
- **Free assignment of input and output functions**
- **Easy software-free configuration**
- **Modular expandability with input and output modules**
- **Diagnosis using LEDs and semiconductor outputs**
- **Easy function selection with rotary switch**
- **Optional fieldbus connection**



Emergency stop

Two-hand circuit

Safety door

Light barrier

Time delay

SAFEMASTER M
more flexibility for your safety

Configure the certified system quickly and easily using the DIP and rotary switches and take advantage of the reduced wiring afforded by plug connectors.

Your configuration tool for SAFEMASTER M!

To configure your safety applications, SAFEMASTER M requires nothing more than a simple screwdriver: Connect safety modules together with ease using a ribbon cable, define the safety function using a rotary switch, and use a DIP switch to assign the safety-related inputs to the outputs and thereby to different safety zones – that's all.

This is a clear advantage over software-based safety systems. You don't require a laptop, nor are software updates necessary.

To put it simply: You can take care of the configuration of your system yourself – and later expansions too. With SAFEMASTER M, you're on the safe side.

Configuration with DIP or rotary switch without software!

SAFEMASTER M intelligently integrates multiple safety modules, saves the expense of hard-wiring and is easy to configure with a screwdriver.

SAFEMASTER M - scalable safety solutions

With the multi-functional safety system SAFEMASTER M and its simple assembly, you are equipped for your safety applications in machine and equipment manufacturing.

The central control unit, which is equipped with safety inputs and safety output with 3 contact paths can be flexibly expanded depending on use with up to three input modules (to the left of the control unit) and up to three output modules (to the right of the control unit) via a ribbon cable.

Thus the SAFEMASTER M is the optimal solution for scalable machines and equipment, for example for the paper and printing industry, molding technology, the packaging industry or the recycling industry, and can be adapted to future requirements.

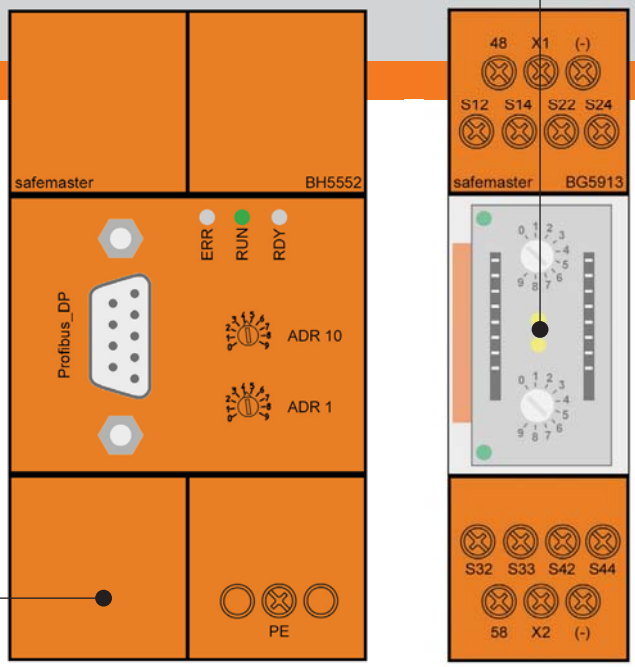
The SAFEMASTER M safety system can be connected to the existing automation solution using an optional field bus module. System status is visualized and enables an easy diagnosis.

Input modules

The input modules BG 5913, BG 5914 and BG 5915 enable the safety-oriented monitoring of emergency stop buttons, light barriers, safety doors and two hand buttons (III A and III C pursuant to EN 574). Up to 8 inputs available per module. The BH design of the input modules are used when galvanically isolated inputs are required for the application.

Fieldbus modules

To connect to an existing automation solution, you expand the system easily with a field bus module, using a ribbon cable., such as BH 5552 (PROFIBUS DP).



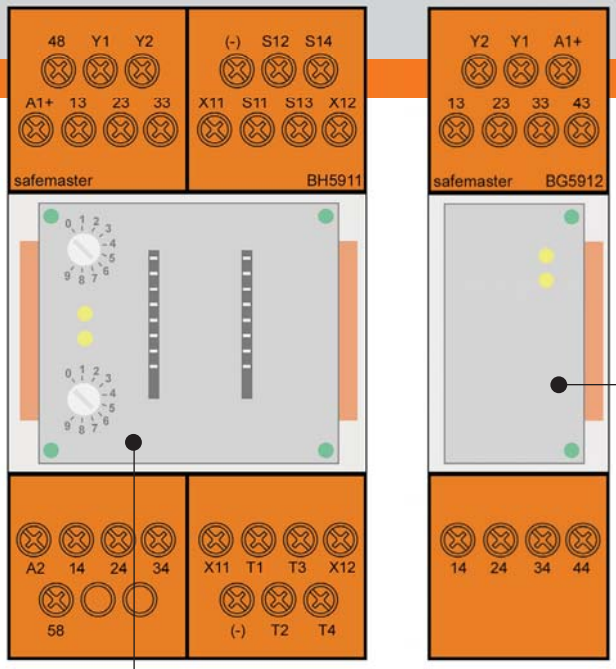
System overview

Minimal configuration

The control unit is the entry point of the SAFEMASTER M system. This unit alone can monitor 2 emergency off buttons (1 channel) or 1 emergency off button and a touchless protective unit (2 channel) 3 safety-oriented contact paths and 2 semiconductor monitoring outputs are also available.

Maximum configuration

SAFEMASTER M is an expandable, scalable and multi-functional safety system. In the maximum configuration it includes the control unit, 3 input and 3 output modules as well as a field bus module. Thus the system offers up to 26 inputs for emergency off buttons, light grids, safety doors or two hand buttons and up to 15 safety-oriented contact paths.



Output modules

In addition to feedback circuit monitoring of external safeguards, the output modules BG 5912 provide various output configurations with up to 4 safety-oriented contact paths as well as time delays up to 20 seconds.

Control unit

The central control unit BH 5911 comes with inputs and a safety-oriented relay output with 3 contact paths. Up to 4 start buttons can be connected to the central control unit, which are assigned to the input modules per DIP switch.

Your safety - simply configured

Configure the TÜV certified SAFEMASTER M safety system quickly and easily using DIP and rotary switches and adapt your SAFEMASTER M to your safety application.

The individual units of the SAFEMASTER M system are connected to each other with ribbon cables. Additional inputs are powered by the control unit via the ribbon cable, reducing hard wiring expenses.

SAFEMASTER M is flexibly adapted to your requirements by adding input and output modules. The modularity concept is further reinforced by the multi-functionality of the input modules. The inputs are assigned to the desired functions via rotary switch for a spectrum of safety functions.

The assignment of inputs to outputs as well as the links to up to 4 start buttons is done most easily by DIP switch on the relevant input module. Every input module can also act on one or more output expansions or even on the outputs of the control unit. Thus groups or hierarchies can be formed flexibly, completely without software.

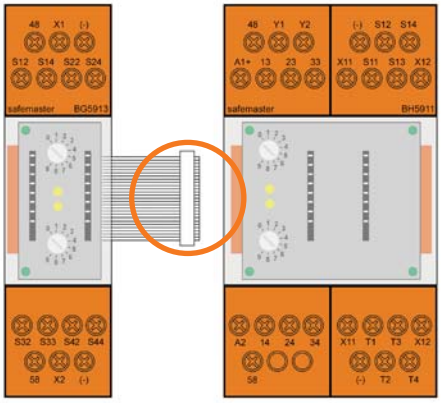
Everything you need -
The SAFEMASTER M can be easily configured with a simple screwdriver.

in 3 steps

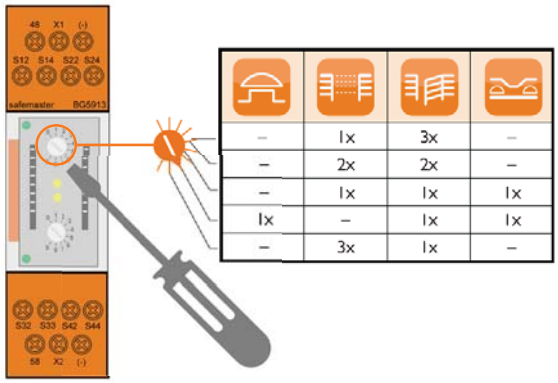
Simple device configuration in only 3 steps:

The individual safety modules are connected together using a ribbon cable. This reduces the expense of hard wiring and increases the flexibility with regard to future requirements.

1 Easily connect safety modules together using a ribbon cable



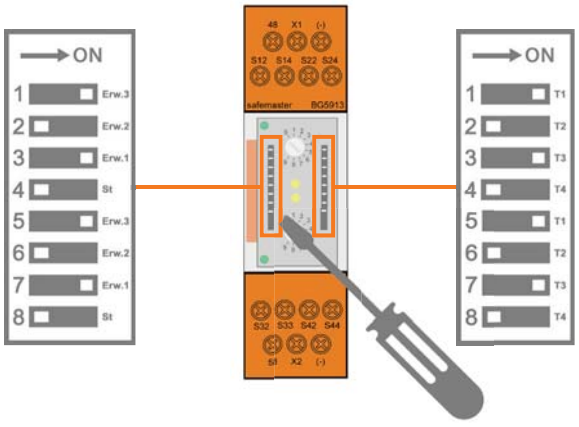
2 Select functions using rotary switches on the control unit and input expansions



–	1x	3x	–
–	2x	2x	–
–	1x	1x	1x
1x	–	1x	1x
–	3x	1x	–

Configuration with DIP or rotary switch without software!

3 Assignment of inputs to outputs and linking of start buttons via DIP switch

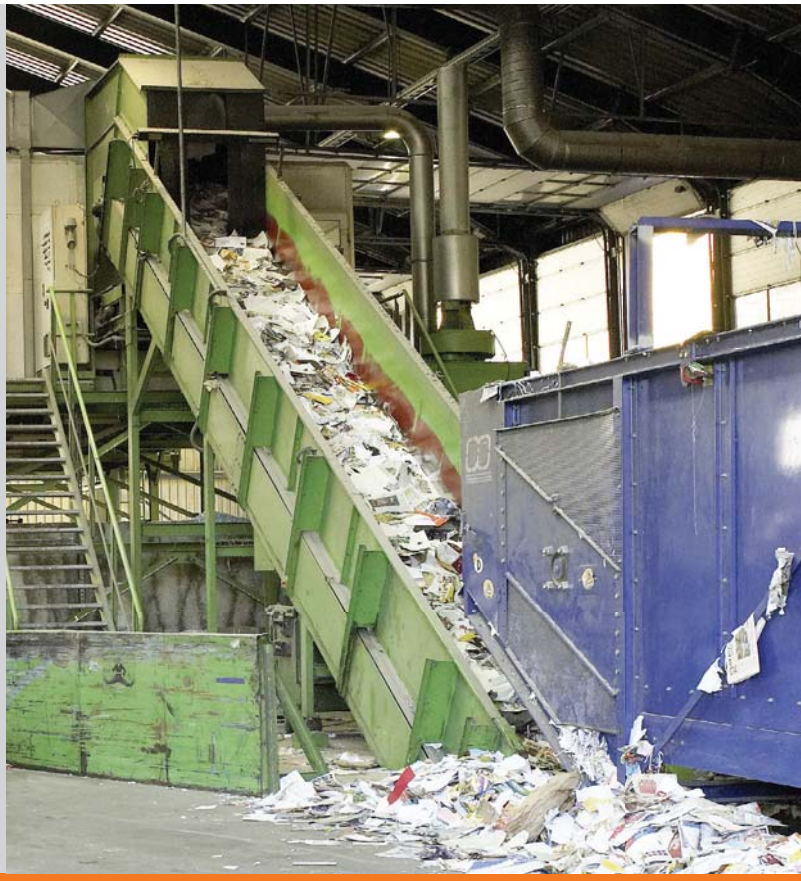


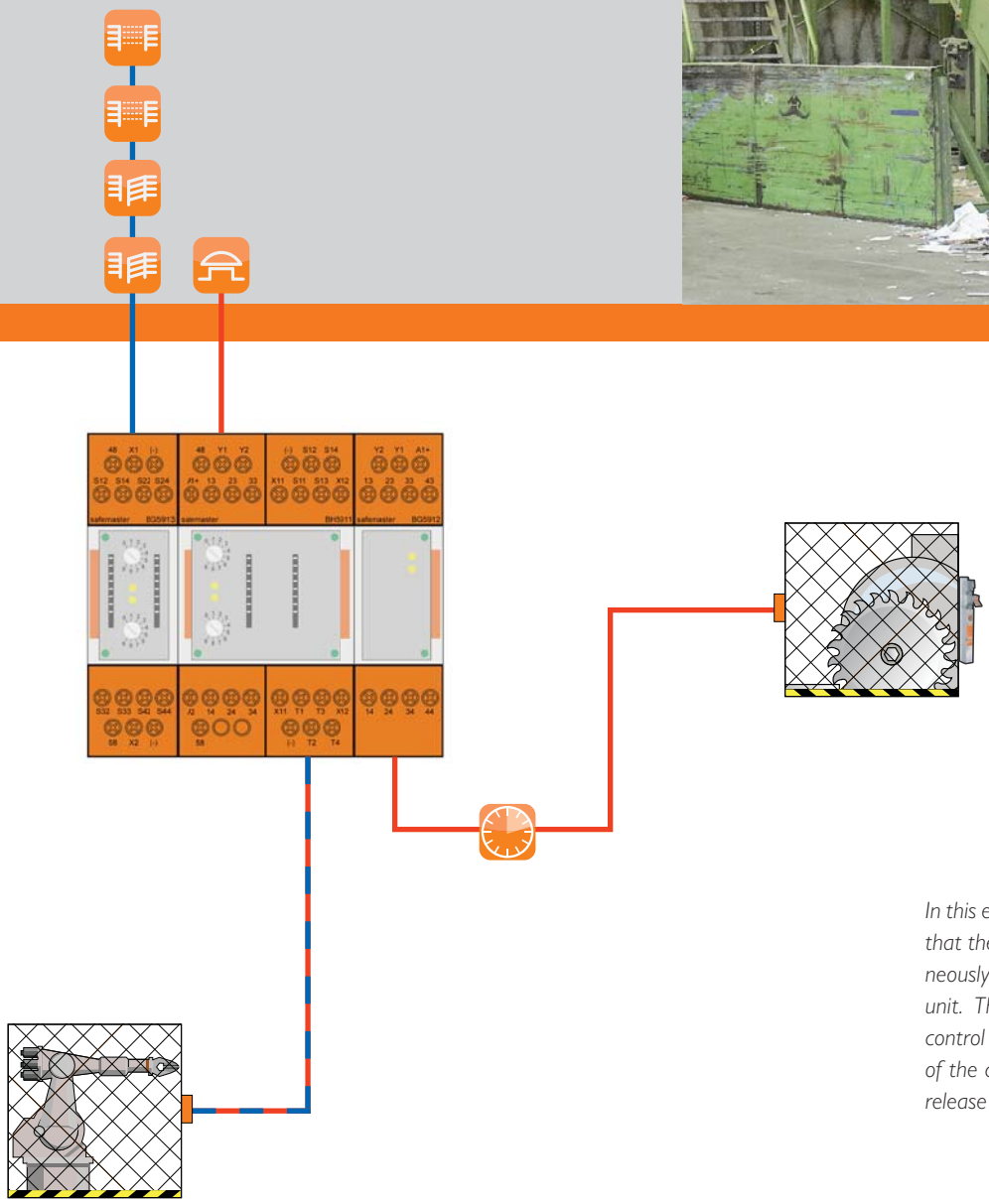
SAFEMASTER M - forming groups and hierarchies

Multifunctional and easy to adjust

With SAFEMASTER M, you can easily and simply configure the safety infrastructure of your system. Using the DIP switch you can determine which actors are served by the connected safety sensors and which are not.

The inputs can be flexibly assigned to the outputs of the central control unit and/or to one to three output expansions, whatever your application requires.





In this example, the SAFEMASTER M is configured so that the safety doors and the light grid act instantaneously on the output contacts of the central control unit. The emergency off button connected to the control unit acts both on the instantaneous contacts of the control unit as well as on the contacts of the release delayed output expansions.

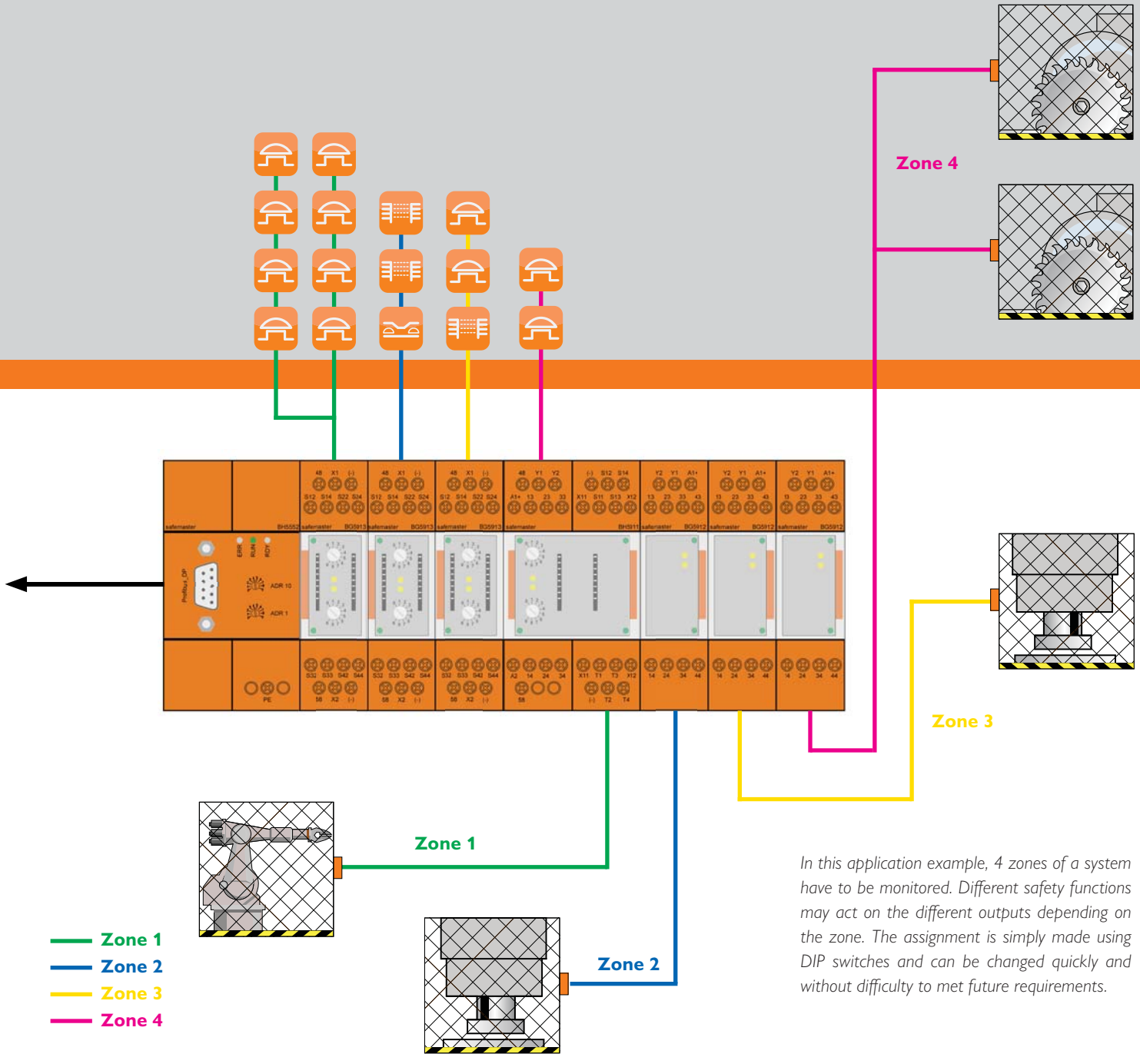
Individual safety solution made-to-measure

SAFEMASTER M can form groups and hierarchies within your facility, which make your process not only safer, but also more efficient.

SAFEMASTER M performs the function of a small safety PLC. Through "switch programming", not only are the inputs assigned to the outputs, but also up to 4 start switches are assigned to the safety functions, all without software.

On the output side too, the multifunctional SAFEMASTER M system offers the highest degree of flexibility. In addition to designs with up to 4 safety oriented contact paths, there are also release delayed output expansions available with delay times of up to 20 seconds.

SAFEMASTER M is thus perfectly adapted to your safety solution.



In this application example, 4 zones of a system have to be monitored. Different safety functions may act on the different outputs depending on the zone. The assignment is simply made using DIP switches and can be changed quickly and without difficulty to met future requirements.

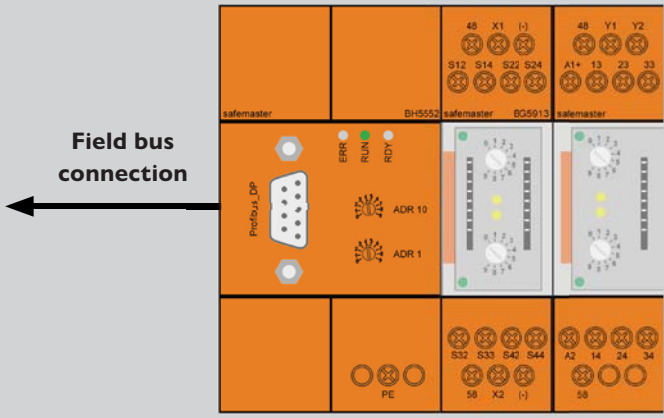
Configure your system individually in zones ...

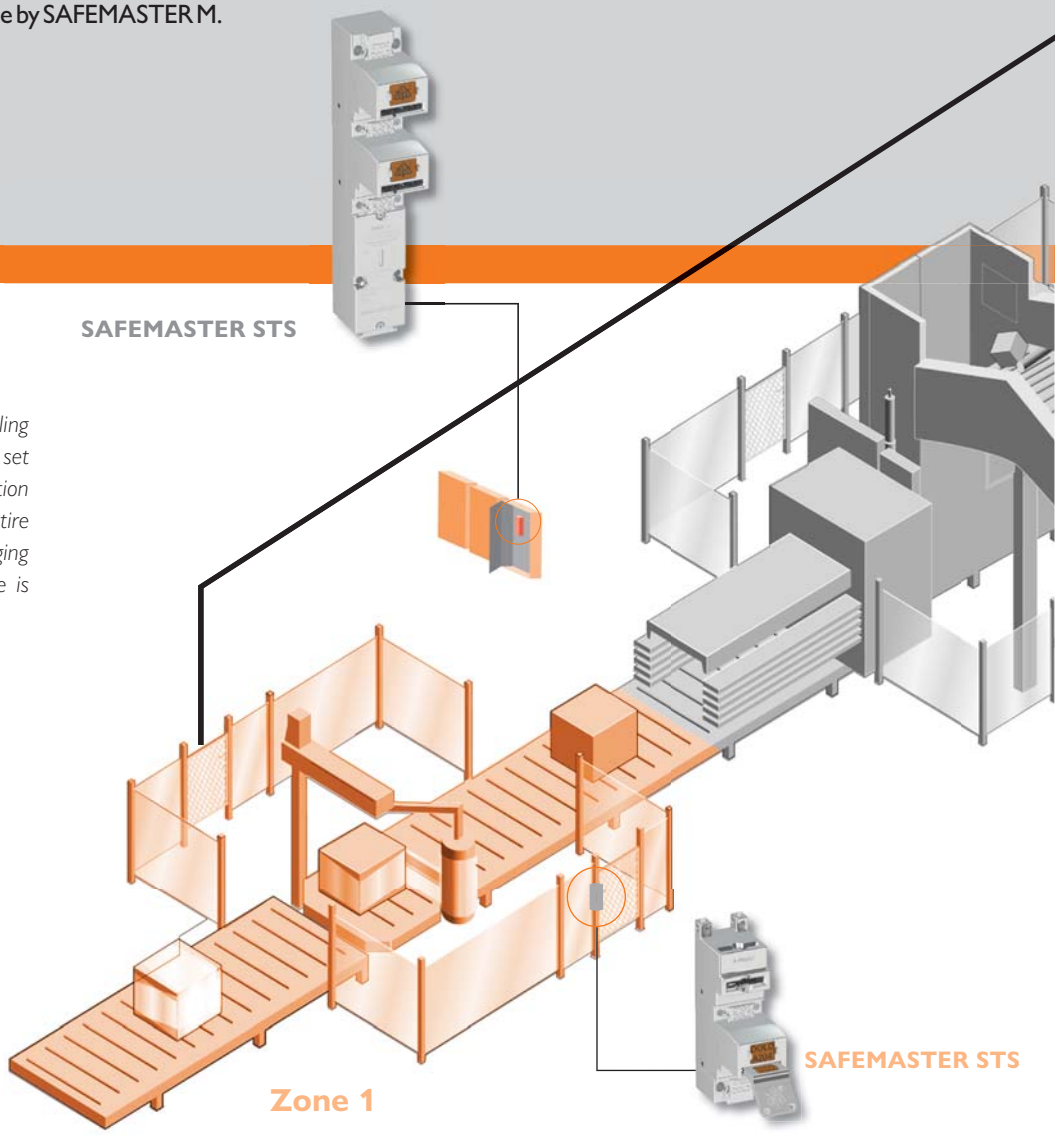
Comprehensive combination options

An industrial system typically consists of multiple units or zones. If an emergency situation occurs or a safety function is triggered, the entire system may be affected – or only individual safety zones.

The complete system does not always have to be shut down. SAFEMASTER M offers an efficient solution to this with flexible assignment of inputs to outputs, even without the use of complex programmable systems.

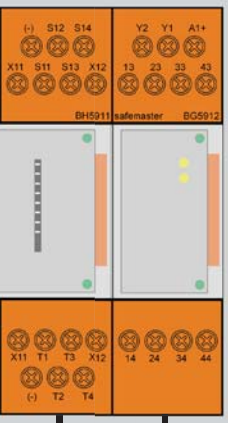
In addition, SAFEMASTER M can be optimally combined with the SAFEMASTER STS safety switch and key transfer system. Maintenance and safety doors of separating protective equipment are secured with the switches and solenoid guard locks of the SAFEMASTER STS system, while the monitoring of light barriers and emergency off switches is done by SAFEMASTER M.





This example shows a concrete example of a baling press plant. Here, multiple safety zones can be set individually, because not every dangerous situation must invariably lead to the shutdown of the entire system. Thus the conveyor unit of the packaging machine may continue to run when one zone is shut down.

also in combination with SAFEMASTER STS

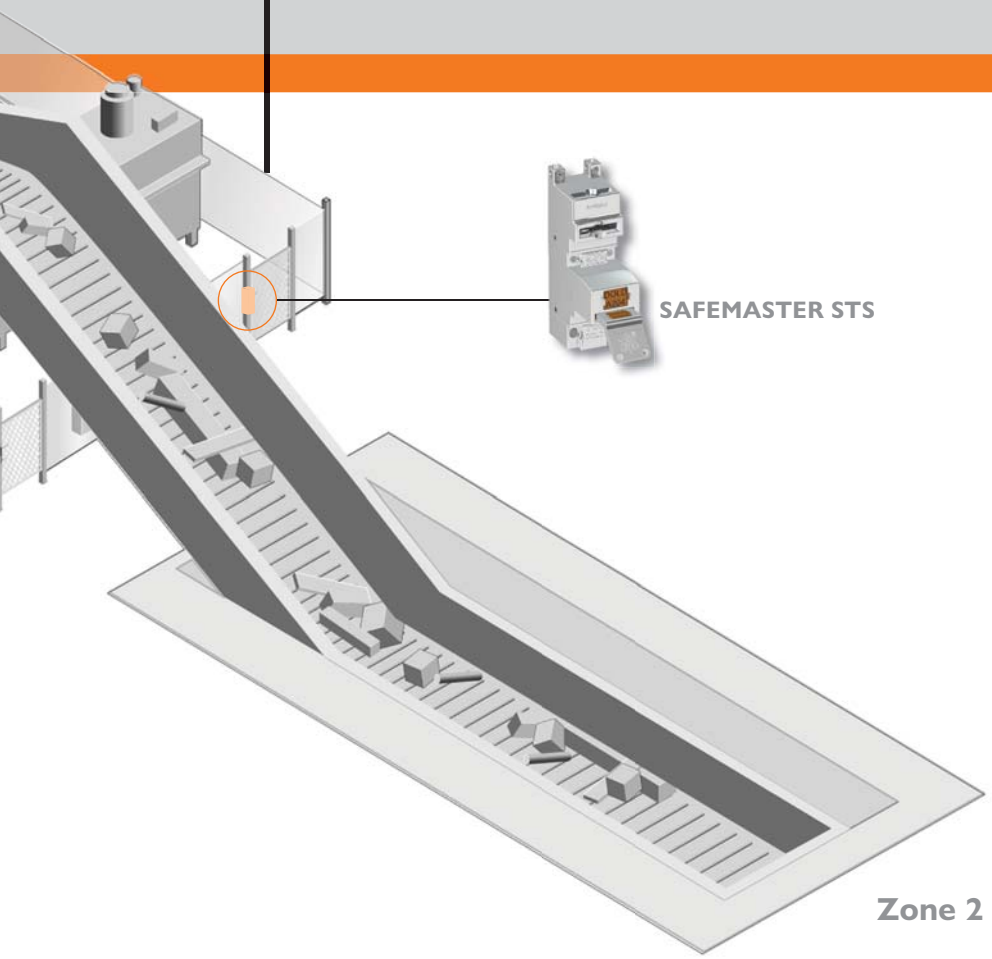


Different safety functions selectable

- Emergency stop
- Safety door
- Time delay
- Two-hand circuit
- Light barrier

TÜVRheinland CERTIFIED
Functional Safety Type Approved
www.tuv.com
ID 0600000000

SAFEMASTER M devices are designed for the highest safety standards (cat. 4 / PL e or SIL 3) and ensure reliable protection of humans and machines.



The safety doors have been additionally secured with the SAFEMASTER STS safety switch and trapped key interlock system from DOLD.

Flexible, versatile, expandable: the system components

Scalable solutions from a single source.

The control unit allows you to combine additional system components in a modular way to design complex solutions for safety and standard control tasks. For this purpose, the safety system can be very easily expanded with additional input and output modules and a fieldbus connection.

Then you can configure the system quickly and smoothly using DIP or rotary switches. Software is not required. This eliminates costs for programming, configuration, and service tools as well as costs for regular software updates required with the introduction of new operating systems and software training costs.

This allows you to realize numerous automation tasks with a single system – from the simplest machine to interlinked systems to even more complex solutions.

Increased efficiency

SAFEMASTER M can help cut down on time and expenses in all engineering phases.

Set up your customized safety system here[1].

	Device type	Designation
	BH 5911.03	Control unit
	BH 5911.22	Control unit
	BG 5913.08	Input module
	BH 5913.08	Input module, galvanically isolated
	BG 5914.08	Input module
	BH 5914.08	Input module, galvanically isolated
	BG 5915.08	Input module
	BH 5915.08	Input module, galvanically isolated
	BG 5912.04	Output module
	BG 5912.48	Output module
	BG 5912.86	Output module, off-delayed
	BG 5912.95	Output module, off-delayed
	BH 5552	Fieldbus module PROFIBUS-DP
	in preparation	Fieldbus module PROFINET

Maximum safety - in all applications

- Mechanical and plant engineering
- Transport and conveyor technology
- Paper and printing industry
- Food industry
- Rubber and plastics industry
- Forming industry
- Recycling industry
- Packaging machines
- Mining and metal
- Chemical and pharmaceutical industry

... and wherever safety has top priority. Your industry too!

Our experience. Your safety – You too can protect your system or machine permanently.

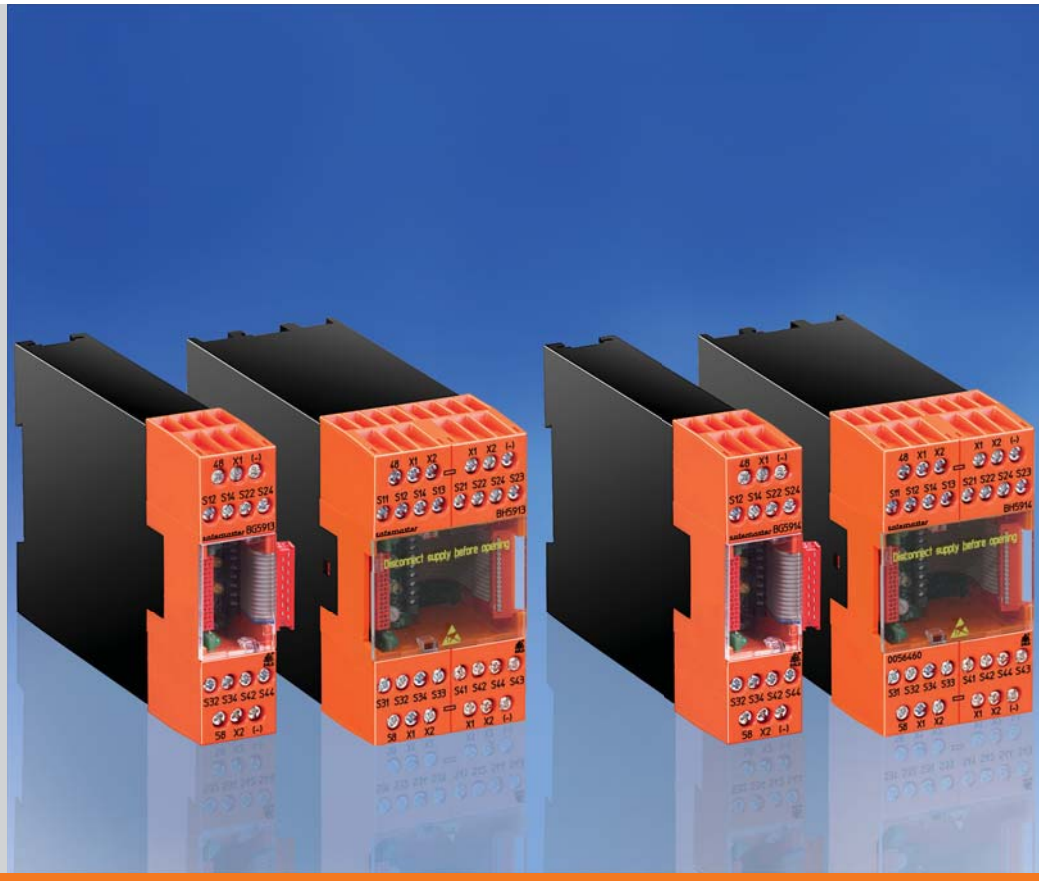
Start inputs	Application, adjustable *				Output contacts, secure		Auxiliary contact	Category acc. to EN 13849-1 *	PL acc. to EN ISO 13849-1 *	SIL acc. to EN 62061 *	Width in mm
	Emergency stop / Emergency shut-off	Light barrier	Safety door	Two-hand	Redundant N/O contacts, max.	Time delay	N/C contacts, max.				
4 start / 3 start + 1 stop	x	x			3			4	e	3	45
4 start / 3 start + 1 stop	x	x			2		1	4	e	3	45
	x	x	x	III A, III C				4	e	3	22.5
	x	x	x	III A, III C				4	e	3	45
	x	x						2	d	2	22.5
	x	x						2	d	2	45
	x	x	x					4	e	3	22.5
	x	x	x					4	e	3	45
					4			4	e	3	22.5
					3		1	4	e	3	22.5
						3 (to 20 s)		4	e	3	22.5
						2 (to 3 s)	1	4	e	3	22.5
											45
											45

*) *Please refer to the relevant data sheet for more detailed information* 1) *Additional configurations on request*

The system components in detail

Versatile and flexible

With SAFEMASTER M, you can monitor safety sensors, light grid signals, emergency stops, two-hand circuits, and more.



Control unit

BH 5911.03 | Item no.: 0055531
BH 5911.22 | Item no.: 0055532

- For monitoring emergency stop, light barrier
- The following inputs/outputs are available for implementing emergency stops:

Inputs:
4 start buttons or
3 start buttons / 1 stop button
2 emerg. stop buttons

Outputs:
3 N/O contacts or
2 N/O contacts / 1 N/C contact as signal contact

- Auto or manual start
- 2 semiconductor outputs for status display
- LED's for status displays
- Over- and undervoltage monitoring with error display
- Continuously monitored feedback circuit for connecting external contactors
- Open-circuit and short-circuit monitoring with error display
- Width 45 mm

Input module

BG 5913.08 | Item no.: 0055530
BH 5913.08 | Item no.: 0059242

- Input module for implementing emergency stop circuits, safety door monitoring, two-hand circuits of type III A, III C acc. to DIN/EN 574, type 4 opto-electronic protective devices, e.g. light barriers
- Functions selectable via step switch
- 8 inputs for control devices
- 2 semiconductor outputs for status display
- Open-circuit and short-circuit monitoring with error display
- LED's for status displays
- BG 5913.08 - width 22.5 mm
- BH 5913.08 - Variant with galvanically isolated inputs - width 45 mm

Input module

BG 5914.08 | Item no.: 0056633
BH 5914.08 | Item no.: 0056460

- Input module for implementing emergency stop circuits, type 4 opto-electronic protective devices, e.g. light barriers
- Open-circuit and short-circuit monitoring with error display
- 2 semiconductor outputs per functional module for status display
- LED's for status displays
- BG 5914.08 - width 22.5 mm
- BH 5914.08 - Variant with galvanically isolated inputs - width 45 mm

Input module

BG 5915.08 | Item no.: 0058869
BH 5915.08 | Item no.: 0058874

- Input module with mutually overriding functional groups
- Input module for implementing emergency stop circuits, safety door monitoring, type 4 opto-electronic protective devices, e.g. light barriers, changeover switches, and enabling switches
- Functional combination and behavior of override adjustable using a step switch
- Open-circuit and short-circuit monitoring with error display
- 2 semiconductor outputs for status display
- LED's for status display
- BG 5915.08 - width 22.5 mm
- BH 5915.08 - Variant with galvanically isolated inputs - width 45 mm

Output module

BG 5912.04 | Item no.: 0056402
BG 5912.48 | Item no.: 0056403

Output module, off-delayed

BG 5912.86 | Item no.: 0056547
BG 5912.95 | Item no.: 0056548

- Safety outputs can be assigned to one or more functional modules (control unit or input modules).
- Safety outputs of output modules
  - 4 N/O contacts
  - 3 N/O contacts, 1 N/C contact
  - 3 N/O contacts 0 ... 3 s off-delayed
  - 2 N/O contacts, 1 N/C contact 0 ... 3 s off-delayed
- Continuously monitored feedback circuit for external contact reinforcement
- LED's for status display
- Width 22.5 mm

Fieldbus module

BH 5552 | Item no.: 0063826
(PROFIBUS DP)

- Transmission of status information of control unit and input modules, e.g. input and error states, assignment to start buttons and safety outputs, to a control device or bus-capable display.
- With galvanically isolated inputs
- Transmission speed adjustable via rotary switch
- Automatic detection of transmission speed
- LED displays for operating voltage and status
- Width 45 mm

Our experience. Your safety.

SAFEMASTER - Multifunctional safety solutions

Innovative safety concepts

As a solution provider for safe automation and electrical safety, DOLD offers a comprehensive product portfolio from a single source. Our SAFEMASTER solutions have been successfully used for many decades around the world.

From single function safety switching devices for simple safety applications through to multifunction, modular safety systems, DOLD develops tailor-made solutions for your industry and applications.

We would be happy to provide you with information about further safety solutions.

SAFEMASTER STS

The SAFEMASTER STS modular safety switch and key transfer system serves to monitor the moveable safety guards. It combines the advantages of safety switches, guard locks, key transfer and command functions in a single system. The new FRP variation stands out for its attractive design, and can be combined with our trusted stainless steel version.

SAFEMASTER S

Our solutions for secure drive monitoring utilise a combination of safe speed, standstill, or frequency monitoring, with or without external sensors, to increase productivity and safety.

SAFEMASTER PRO

The modular and configurable SAFEMASTER PRO safety system monitors all safety circuits of your machinery and installations – in a simple, flexible and safe manner. The number of inputs and outputs of the central control unit can be upgraded via extension modules at any time. Now also featuring safe speed monitoring and dynamic program realization.

SAFEMASTER W

The emergency stop system and radio-controlled enabling switch in the SAFEMASTER W series can be used to wirelessly shut down hazardous movements in a fraction of a second. The Wireless Safety System thus ensures maximum freedom of movement for the operating and maintenance personnel.

More

Info

DOLD

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