

0261526

- Multifunction, modular safety system with field bus interface

#### Your Advantages

- Free interconnection of input and output functions
- Group hierarchy easily achieved
- No programming required
- Simple set up via internal switches
- Function selection set by screwdriver
- Control of a large system is possible without complicated wiring
- Flexible on site adjustment available to change functions
- System is easily extended via extender modules
- System indication on all modules via LED and semiconductor monitoring outputs
- Field bus interface option available to signal the system status
- Multifunction allows ease of design and build

#### Approvals and Markings



#### Applications

flexible, multi purpose and expandable

The SAFEMASTER M multifunction system offers an ideal solution to control the safety functions for many areas in machine building and plant processing.

For example: Paper and printing industry, Forming machinery, Food, Beverage and Packaging industry, Robot cells, Machine tools and complete production transfer lines.

In many cases this system offers a complete solution to the ever-increasing demand in automation to process more and more safety functions, the SAFEMASTER M offering a highly flexible but cost effective solution compared with conventional safety modules.

This system is suitable to link and control safety functions to safety category up to Cat. 4, PLe (EN ISO 13849-1) resp. SIL 3 (IEC/EN 61508, IEC/EN 62061).

Ideal solutions for mobile and stationary machines and plants with dangerous areas

- during automatic operation e. g. to clear failures
- during set up e. g. to adjust machine parameters, maintenance, set up

#### Features

- Up to 26 single-channel or 13 2-channel input circuits
- Up to 15 redundant, safety output contacts according to cat. 4 PLe (EN ISO 13849-1) e. g. SIL 3 (IEC/EN 61508, IEC/EN 62061)
- 4 start button-inputs for enabling/acknowledgement
- 2 Semiconductor monitoring output in each input module and control unit
- 1 input for a feed back circuit in output module each
- Manual/Auto-Start
- with/without cross fault detection
- As option with instantaneous or delayed relay outputs
- System indication via optional field bus interface
- 4 output groups operated either separately, together or individually combined.

#### Additional Information About This Topic

- You will find information about the single modules of SAFEMASTER M in each datasheets (see „system components“)
- You will find detailed information in the System description SAFEMASTER M

### More Functions, More Flexibility and High Safety Level

The software free safety system SAFEMASTER M allows individual safety solutions. Monitoring of different safety functions like e-stop, safety gates, light barriers, light curtains, safety mats, 2-hand controls according to EN 574 IIIA/IIIC etc. can be made. Instantaneous stop or controlled disconnection with delayed contacts is possible.

### Free Assignment of Input Modules to Output Modules

The SAFEMASTER M includes the most important functions of a small safety plc. It controls as master unit the safety functions of machines and production lines. The input modules can be assigned individually to output modules. A gateway as option allows to connect the system to existing, non-safety bus systems for indication purposes.

### No Software Necessary

Software is not required. The configuration is made using simple DIP-switches. This means no cost for programming, configuration and service tools, no problems and no cost for updates when new operating systems are introduced. Cost for software training is also saved.

### Partner for a Standard PLC

The SAFEMASTER M is an ideal supplement to a standard plc. While the plc is responsible for the machine control, SAFEMASTER M handles all safety related switching functions. Safety relevant states can be transferred by standard semiconductor outputs or via field bus connection to the plc for indication.

### The System

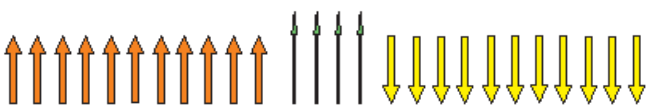
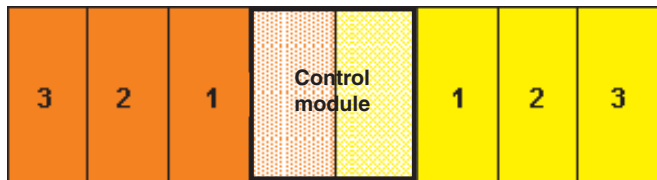


Diagnostic Module  
- CANopen  
- Profibus-DP

Input Module

Control Unit

Output Module



Up to 26 inputs  
(single channel)

T1 T2 T3 T4  
4 start inputs  
(enabling, reset)

Ext. 1 Ext. 2 Ext. 3  
up to 15 safety output contacts

Ext. 1-3 = Extension modules 1-3

### The Control Module

The heart of SAFEMASTER M is the control module BH 5911. It is the controller of the whole system but includes already input and outputs. A dual channel input for Cat4 e-stop is integrated. When using single channel Cat2 e-stops, 2 e-stop loops are available. 4 start inputs are also integrated in the control module. The assignment of the start buttons to the input modules is made via DIP-switches in each individual input module. Up to 3 input modules can be placed on the left side and up to 3 output modules to the right side of the control module on a DIN rail. The electrical connection is made by a flat type cable.

### The Input Module

The safety functions are programmed in the firmware of the input modules. A speciality of the input modules is that up to 4 safety functions of cat. 4, PLe (EN ISO 13849-1) resp. SIL 3 (IEC/EN 61508, IEC/EN 62061) are integrated i. e. 8 safety input channels.

Modules can have 4 identical safety functions, ore mixed functions. DOLD has made a pre-selection of the most common required combinations in practice. To reduce the number of possible combinations to a minimum each module contains up to 4 different combinations of the 4 possible safety functions that can be chosen on site by the user. This multifunction feature reduces stock cost.

The selection of the right input module is very important to get the optimum solution. For demonstration see below example with the modules BG5913.08/01MF0.

Each input module has 2 semiconductor outputs for indication e. g. to a PLC.

#### BG5913.08/01MF0

#### Dual channel safety functions

-	1 x	3 x	-
-	2 x	2 x	-
-	1 x	1 x	1 x
1 x	-	1 x	1 x
-	3 x	1 x	-

### The Output Modules

Each output module has safety related (redundant) outputs according to Cat 4, PLe (EN ISO 13849-1) resp. SIL 3 (IEC/EN 61508, IEC/EN 62061). All contacts in one module switch together. Different contact combinations are available e. g.







- 4 NO contacts
- 3 NO contacts, 1 NC contact
- instantaneous switching
- delayed switching
- combination of instantaneous and delayed

Each output module integrates a feed back input to monitor external contactors.



Set up your customized safety system here <sup>1)</sup>



Device type	Designation	Start inputs	Application, adjustable				Safety output contacts		Non safety auxiliary contacts	Category acc. to EN 13849-1	PL acc. to EN ISO 13849-1	SIL acc. to EN 62061	Width in mm
			E-Stop / E-shut-off	Light barrier	Safety gates	Two-hand	Instantaneous contacts	Delayed contacts					
	BH 5911.03/00MF0	Control unit	4 start / 3 start + 1 stopp	x	x			3		4	e	3	45
	BH 5911.22/00MF0	Control unit	4 start / 3 start + 1 stopp	x	x			2	1	4	e	3	45
	BG 5913.08/00MF0	Input module		x	x	x	III A, III C			4	e	3	22.5
	BH 5913.08/00MF0	Input module, galvanically isolated		x	x	x	III A, III C			4	e	3	45
	BG 5913.08/01MF0	Input module		x	x	x	III C			4	e	3	22.5
	BG 5913.08/02MF0	Input module		x	x	x	III C			4	e	3	22.5
	BG 5913.08/03MF0	Input module		x	x		III C			4	e	3	22.5
	BG 5914.08/00MF0	Input module		x	x					2	d	2	22.5
	BH 5914.08/00MF0	Input module, galvanically isolated		x	x					2	d	2	45
	BG 5915.08/00MF0	Input module		x	x	x				4	e	3	22.5
	BH 5915.08/00MF0	Input module, galvanically isolated		x	x	x				4	e	3	45
	BG 5912.04	Output module						4		4	e	3	22.5
	BG 5912.48	Output module						3	1	4	e	3	22.5
	BG 5912.86	Output module, off-delayed						3 (to 20 s)		4	e	3	22.5
	BG 5912.95	Output module, off-delayed						2 (to 3 s)	1	4	e	3	22.5
	BH 5552	Feldbusmodul PROFIBUS-DP											45
	in Vorbereitung	Feldbusmodul PROFINET											





<sup>1)</sup> Additional configurations on request!

## Input Modules - Properties and Application

Device type	Designation	Application, adjustable				Category acc. to EN 13849-1	PL acc. to EN ISO 13849-1	SIL acc. to EN 62061	Width in mm
		 E-Stop / E-shut-off	 Light barrier	 Safety gates	 Two-hand				
 BG 5913.08/00MF0 BH 5913.08/00MF0*)	Input module	4	-	-	-	4	e	3	22.5
		-	4	-	-				
 BG 5913.08/01MF0	Input module	-	1	3	-	4	e	3	22.5
		-	2	2	-				
 BG 5913.08/02MF0	Input module	-	3	1	-	4	e	3	22.5
		1	1	1	1				
 BG 5913.08/03MF0	Input module	1	1	-	-	4	e	3	22.5
		4	-	1	1				
 BG 5914.08/00MF0 BH 5914.08/00MF0*)	Input module	1-channel	2-channel	-	-	2	d	2	22.5
		8	-	-	-				
 BG 5915.08/00MF0 BH 5915.08/00MF0*)	Input module	6	1	-	-	4	e	3	22.5
		6	-	1	-				
 BG 5915.08/00MF0 BH 5915.08/00MF0*)	Input module	manual	auto	-	-	4	e	3	22.5
		2	-	-	-				
		or							
		2	1	-	-				
		-	2	-	-				
		or							
		-	3	-	-				
		-	-	-	1				
		or							
		-	-	-	2				
-	-	1	2						
or									
1 enabling switch									

\*) with galvanically isolated inputs

## Output Modules - Properties and Application

 BG 5912.04	 BG 5912.48	 BG 5912.86	 BG 5912.95
