CARREL-ELECTRADE LTD

not just products... solutions!

"Safety Products"
2022
short form Catalogue

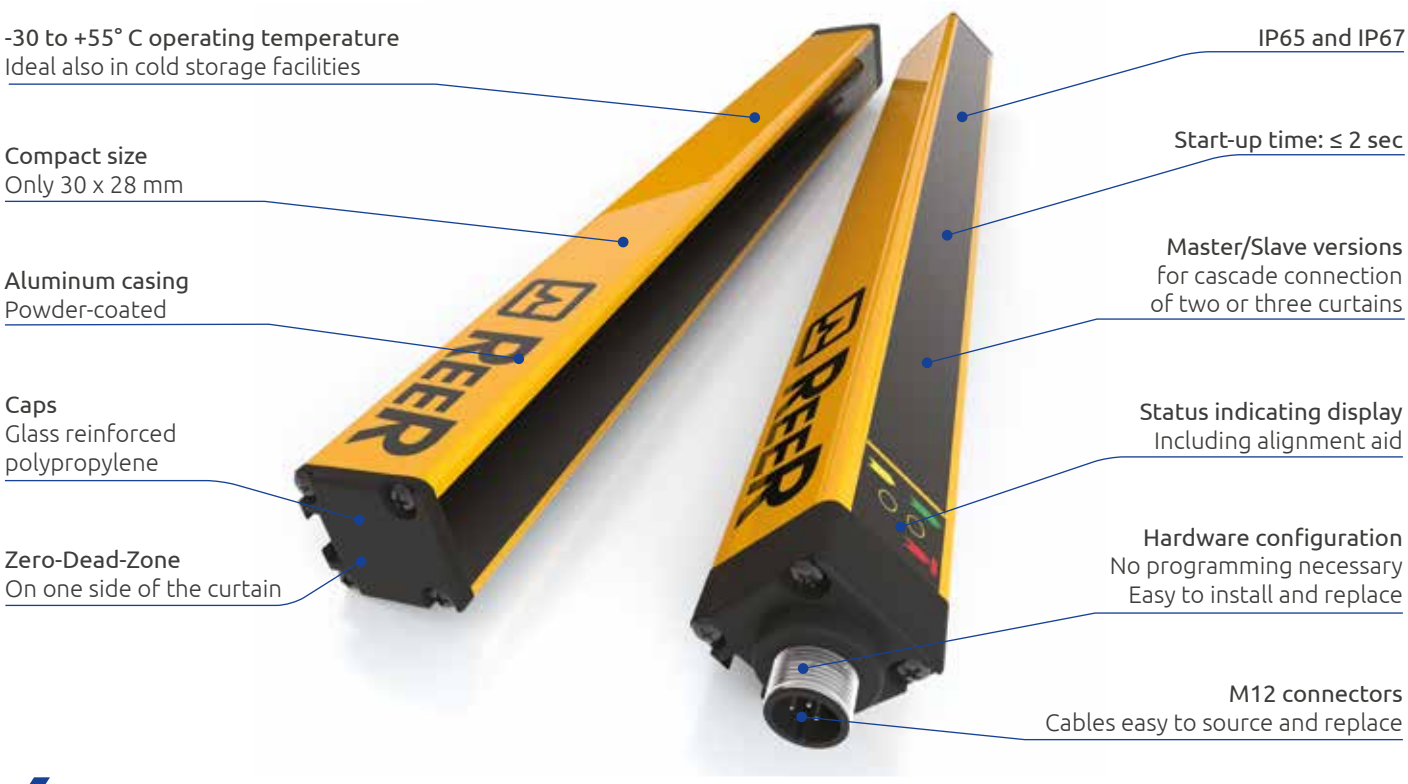
EOS4 - EOS2

COMPACT SAFETY LIGHT CURTAINS AND GRIDS

One simple product range to cover most of today's industrial applications.

- Safety light curtains: finger, hand and body detection
- Safety light grids: multi-beam (2, 3 or 4 beams for access control
- Unique features and a comprehensive range of accessories
- Standard versions with automatic restart
- Integrated function versions with selectable automatic/manual restart
- Operating range up to 20 m, protected height up to 2,2 m

Watch the video!



CHARACTERISTICS

STANDARD (A)		INTEGRATED FUNCTIONS (X)		INTEGRATED FUNCTIONS (X) FOR CASCADE CONNECTION
EOS4 A / AT / ATL EOS2 A / AT / ATL	EOS4 AH (high range)	EOS4 X / XT / XTL EOS2 X / XT / XTL	EOS4 XH (high range)	EOS4 XM / XS / XS2 EOS2 XM / XS / XS2
Selectable operating range: 0 ... 4 m - low, 0 ... 12 m - high EOS4 A with 14 mm resolution models: 0 ... 3 m - low, 1 ... 6 m - high ATL versions: 0 ... 2 m - low, 0 ... 6 m - high	Selectable operating range: 0 ... 10 m - low 3 ... 20 m - high	Selectable operating range: 0 ... 4 m - low, 0 ... 12 m - high EOS4 X with 14 mm resolution models: 0 ... 3 m - low, 1 ... 6 m - high XTL versions: 0 ... 2 m - low, 0 ... 6 m - high	Selectable operating range: 0 ... 10 m - low 3 ... 20 m - high	Selectable operating range: 0 ... 4 m - low, 0 ... 12 m - high EOS4 with 14 mm resolution models: 0 ... 3 m - low, 1 ... 6 m - high
Automatic Start/Restart		Selectable manual or automatic Start/Restart		
External relay monitoring (EDM) through external interfaces, i.e. AD SR1, Mosaic or safety PLC		Integrated feedback input for external relay monitoring (EDM). When a relay output is needed, the use of a AD SR0 is recommended		

2 safety static outputs PNP with auto-test protected against short circuits and overloads

CABLES NEEDED

EOS4 and EOS2 standard versions (A)		EOS4 and EOS2 with integrated functions versions (X)	
Emitter:	M12 5-pole (CDx)	Emitter:	M12 5-pole (CDx)
Receiver:	M12 5-pole (CDx)	Receiver:	M12 8-pole (C8Dx)
Master, Slave 2 and Slave connection			M12 5-pole (CDx)

See page 33

SAFETY LEVEL TYPE 4 — SIL 3 - SILCL 3 PL e - Cat. 4

SAFETY LEVEL TYPE 2 — SIL 1 - SILCL 1 PL c - Cat. 2

MODULAR SAFETY INTEGRATED CONTROLLER

Mosaic is a configurable safety hub able to manage all safety functions of a machinery or a plant. Configurable and scalable, allows costs reduction and minimal wiring.

Mosaic can manage safety sensors and devices such as: light curtains, photocells, laser scanners, emergency stops, electromechanical switches, guard-lock door switches, magnetic switches, RFID switches, inductive sensors, mats and edges, two-hand controls, hand grip switches, encoders / proximities for safety speed control and analogue sensors (i.e. loading cells, pressure switches, temperature measurement, flow and level measurement, etc.).

Watch the video!

MVx
Expansion units for safety speed monitoring

MOR4
Safety relay units with configurable outputs

Mosaic M1 (Standard) or Mosaic M1S (Enhanced) Master Unit
The Master Unit can be used as a stand-alone device or to control other expansion units

MBx
Expansion units for connection to the most common industrial Fieldbus systems for diagnostics and data communication

MIx, MOx
Additional Input/ Output units

MAx
Analogue inputs expansion unit

ADVANTAGES

- Reducing the number of devices and wiring used and, therefore, the overall size of the project
- Speeding-up control panel construction
- Allow tamper-proof system configurations
- All logic is configured through a graphic interface. No more laborious wiring is needed as with traditional solutions
- A lower number of electromechanical components also means a better Performance Level and, therefore, a higher Safety Level
- The project report provides the actual values of PFH_D DC_{avg} and $MTTF_D$ according to EN 13849-1 and EN 62061

MSC Mosaic Safety Communication connector
Allows communication between the various units through a proprietary high-speed safety bus

Removable terminals

MTBC
Clamp terminal blocks

MTB
Screw terminal blocks

MCM Mosaic Configuration Memory
Removable memory card for saving Mosaic configuration data for subsequent transfers to a new device (without using a PC) or for backup

Configuration via USB
USB 2.0 serial bus for the connection to the Mosaic Safety Designer software (MSD)

STAND-ALONE SAFETY INTEGRATED CONTROLLER

MZERO is a configurable safety hub able to manage all safety functions of a machinery or a plant.
Allows cost reductions and minimal wiring.

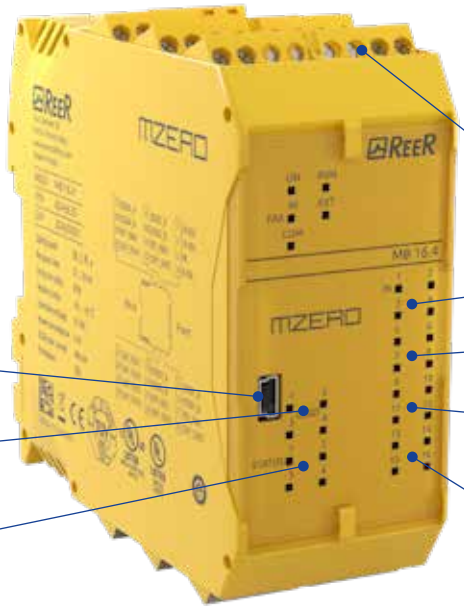
MZERO can manage safety sensors and signals such as light curtains, photocells, laser scanners, emergency stops, electromechanical switches, guard-lock door switches, magnetic switches, RFID switches, inductive sensors, mats and edges, two-hand controls and hand grip switches.

Configuration via USB

USB 2.0 serial bus for the connection to the MZERO Safety Designer software (MZD)

4 pairs OSSD safety outputs (PNP 400 mA)

4 test outputs (for short-circuit monitoring)



Removable terminals

MTBC Clamp terminal blocks
MTB Screw terminal blocks

16 safety inputs

64 logical operators

4 SIL 1/PL c status outputs (PNP 100 mA)

4 inputs for Start/Restart interlock, EDM or single input devices

SAFETY LEVEL
SIL 3
SIL3 - SILCL 3
PL e - Cat. 4

c UL us LISTED

Pending

PART NUMBERS

MZERO 16.4 [1100005] with screw terminal block
MZERO 16.4 C [1100205] with clamp terminal block

ADDITIONAL SAFETY RELAY OUTPUT MODULES

MR2 [1100040] [1100140]
2 safety relays with guided contacts
2 NO + 1 NC contacts (250 VAC 6 A)
1 NC contacts for EDM feedback

MR4 [1100041] [1100141]
4 safety relays with guided contacts
4 NO + 2 NC contacts (250 VAC 6 A)
2 NC contacts for EDM feedback

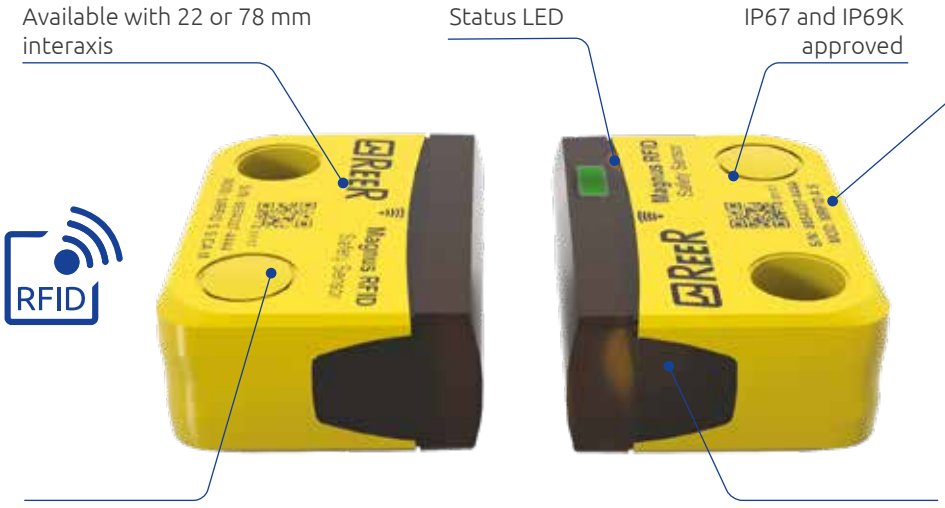
MR8 [1100049] [1100149]
8 safety relays with guided contacts
8 NO + 4 NC contacts (250 VAC 6 A)
4 NC contacts for EDM feedback

ADVANTAGES

- Bringing full configuration capabilities at the cost of a standard safety relay
- Reducing the number of devices and wiring used and, therefore, the overall size of the project
- Speeding-up control panel construction
- Allow tamper-proof system configurations
- All logic is configured through a graphic interface. No more laborious wiring is needed as with traditional solutions
- A lower number of electromechanical components also means a better Performance Level and, therefore, a higher Safety Level
- The project report provides the actual values of PFH_D DC_{avg} and $MTTF_D$ according to EN 13849-1 and EN 62061

CONTACTLESS RFID SAFETY SWITCH

Safety switches for position control of movable guards.



Actuation options

- **Individual coding**
  The actuator is programmed via teach-in and permanently assigned to the sensor during set-up (the process can be repeated if necessary)
- **Actuator coded**
  The actuator is free and not specifically assigned to the sensor (one actuator can work with multiple sensors)

Cabling

S series - 22 mm interaxis

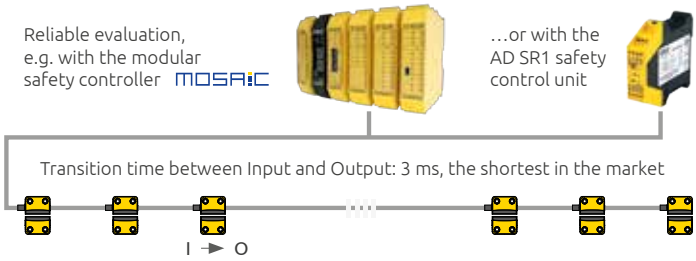
B series - 78 mm interaxis

CABLES NEEDED

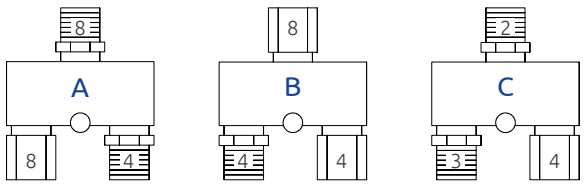
M12 connector models: M12 8-pole (C8Dx) See page 33

Note: Alternatively, M12 8-pole (MRFID EC C8x) extension cables can be used. See the pin-out on the right side.

ACCESSORIES FOR SERIES CONNECTION



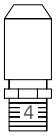
T connectors



MRFID TC A [1292404] M12 T connector - Type A
For the diagnostic signal

MRFID TC B [1292403] M12 T connector - Type B
For series connections of 2 or more sensors

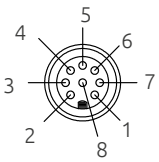
MRFID TC C [1292405] M12 T connector - Type C
To introduce additional power supplies in long series



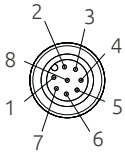
M RFID TP [1292402]
Termination plug

Combo (Sensor + Actuator)

	Model	Part number	Connection	Coding
S	MRFID C S CA M	1292000	M12 connector	Actuator coded
	MRFID C S CA 5	1292003	5 m cable	
	MRFID C S IA M	1292010	M12 connector	Individual coding
	MRFID C S IA 5	1292013	5 m cable	
B	MRFID C B CA M	1292100	M12 connector	Actuator coded
	MRFID C B CA 5	1292103	5 m cable	
	MRFID C B IA M	1292110	M12 connector	Individual coding
	MRFID C B IA 5	1292113	5 m cable	



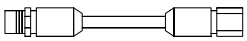
Pin-out C8Dx



Pin-out MRFID EC C8x

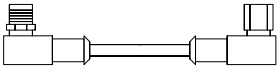
Extension cables

Male - Female M12 4-pole straight connector cable
MRFID EC S4 1 [1292414] 1 m
MRFID EC S4 3 [1292415] 3 m
MRFID EC S4 5 [1292416] 5 m
MRFID EC S4 10 [1292417] 10 m



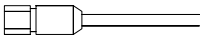
Male - Female M12 8-pole straight connector cable
MRFID EC S8 1 [1292422] 1 m
MRFID EC S8 3 [1292423] 3 m
MRFID EC S8 5 [1292424] 5 m
MRFID EC S8 10 [1292425] 10 m

Male - Female M12 4- pole 90° angle connector cable
MRFID EC L4 1 [1292418] 1 m
MRFID EC L4 3 [1292419] 3 m
MRFID EC L4 5 [1292420] 5 m
MRFID EC L4 10 [1292421]10 m



Female M12 4-pole straight connector cable
MRFID EC C4 1 [1292406] 1 m
MRFID EC C4 3 [1292407] 3 m
MRFID EC C4 5 [1292408] 5 m
MRFID EC C4 10 [1292409] 10 m

Female M12 8-pole straight connector cable
MRFID EC C8 1 [1292410] 1 m
MRFID EC C8 3 [1292411] 3 m
MRFID EC C8 5 [1292412] 5 m
MRFID EC C8 10 [1292413] 10 m



PROXIMITY INDUCTIVE SAFETY SENSOR

A complete range of safety switches for position detection.

- Compliant to EN 60947-5-3 for electromechanical control gear
- Ensuring operator and machine safety
- No special actuator for electronic fail-safe sensors required
- Connection to safety interface, safety controller or safety PLC (i.e. AD SR1, Mosaic)

Cylindrical with metal thread

	PI M12 NF	PI M18 NF	PI M30 NF	PI M30 NF K	PI M18 F	PI M18 FR	PI M30 F
Safety level	PL d / SIL 2			PL e / SIL 3	PL d / SIL 2		
Mounting	Non-flush mountable				Flush mountable		
Dimensions (mm)	M12 x 1 L = 70	M18 x 1 L = 70,5	M30 x 1,5 L = 70	M30 x 1,5 L = 80	M18 x 1 L = 70	M18 x 1 L = 86,5	M30 x 1,5 L = 70
Enable zone (mm)	0,5 ... 4	1 ... 8	1 ... 15	6 ... 12	1 ... 5	> 10	6 ... 12
Part number	1293000	1293001	1293004	1293006	1293002	1293003	1293005

Rectangular

	PI SQ F-NF	PI SQ NF
Safety level	PL e / SIL 3	
Mounting	Non-flush or flush mountable	Non-flush mountable
Dimensions (mm)	40x40x66	40x40x66
Enable zone (mm)	10 ... 15	4 ... 20
Part number	1293007	1293008

CABLES NEEDED

All models: M12 5-pole See page 33

ACCESSORIES

Angle brackets

M12 [1293100]
M18 [1293101]
M30 [1293102]

Mounting clamps

M12 [1293103]
M18 [1293104]
M30 [1293105]

APPLICATIONS

1. Door or flaps detection at closed position
2. Cylinder shaft detection
3. Treads up detection
4. Cable position detection
5. Equipment position control
6. Robot cell working limitation of the working area
7. Safe position
8. Wind turbine lock / end-position of the blade

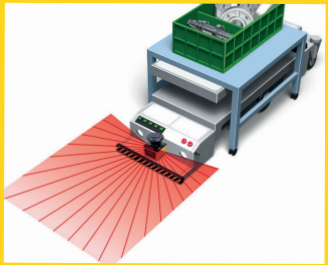
Small, light ...

Compact design: 95 x 80 x 80 mm, 0,8 Kg

SAFETY LEVEL
TYPE 3
SIL 2
PL d - Cat. 3

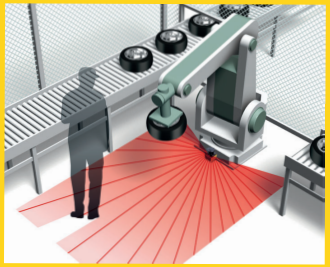
Expands the range of safety applications

Collision prevention



32 safety area patterns to accommodate the AGV travel path for collision prevention

Presence detection



Detects humans or objects entering the hazardous area

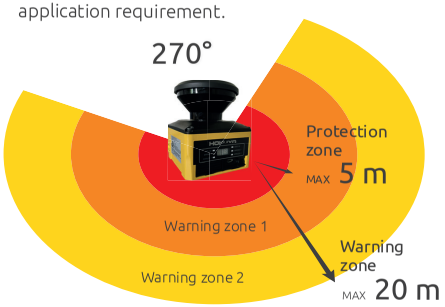
Intrusion detection

Detects access into critical zone

... and user-friendly!

Protection over a wide range

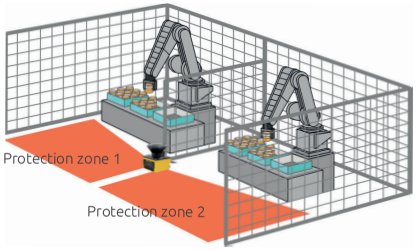
Up to 5 meters of protection zone and 20 meters of warning zone configuration to suit various application requirement.



2 operating modes
2 warning zones + 1 protection zone
2 simultaneous protection zones

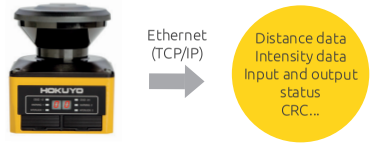
Dual protection mode

UAM can simultaneously protect two hazardous areas. Separate OSSD signals are triggered for the respective protection zones making it possible to guard two machines with a single UAM.



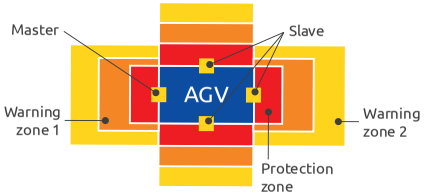
Data output via ethernet

Measurement data can be acquired via Ethernet with status of input/output signals and cyclic redundancy check code. Also supports command in SCIP2.0 protocol.



Master-slave function

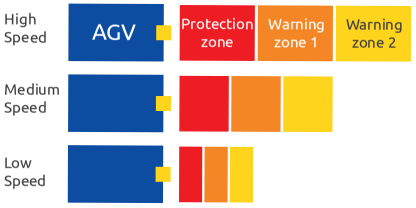
Maximum 4 units of UAM can be interconnected for Master-Slave operation when multiple units are required to guard the hazardous area. The system can be controlled by connecting the input and output signals to Master unit only[1].



[1] It is not possible to control the actuators via master-slave bus communication

Encoder input

In AGV applications, area is switched depending on the vehicle's speed. Speed and direction of travel provided via encoders are constantly monitored to switch the area and stop the AGV during abnormal travel.



SD card for configuration

Configuration data can be saved in a SD card which in turn can be used for configuring the UAM without connecting it to a PC. The feature is useful while replacing the UAM or configuring multiple units with the same settings.

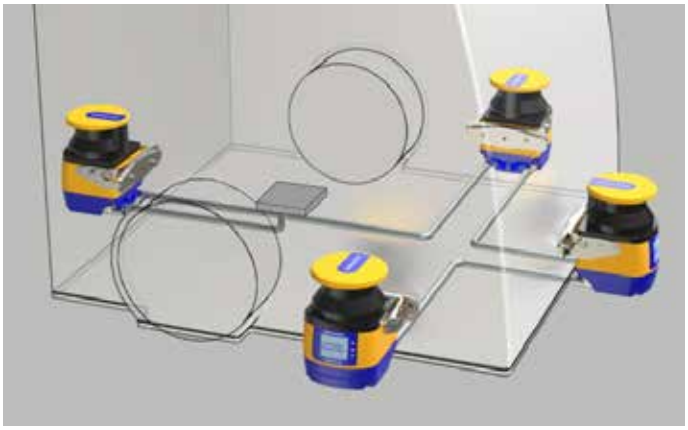
LASER SENTINEL™ ENHANCED

your sentinel for safe area protection

Laser Sentinel Master/Slave

- Safety Laser Scanner Type 3, Pl d, SIL 2
- Up to 3 simultaneous Safety zones up to 5.5 m (NEW)
- Up to 2 simultaneous Warning Zones up to 40 m
- Advanced measurement data on Ethernet (NEW)
- Display with colour-based Intrusion Detection System
- Configurable outputs for general fault or "clean window" alarm
- 8/12/17 pins M12 connectors for standard cabling
- Encoder inputs for speed monitoring (NEW)
- Partial dynamic muting (NEW)
- 275° Opening Angle
- (NEW) 30/40/50/70/150 mm detection capability Selectable by Graphic User Interface
- Muting and Override functions available
- (NEW) Up to 70 zone safe set switching
- (NEW) Replaceable window
- Master-slave connection includes seamless safe communication and power transmission
- Ethernet port on Master for programming and monitoring of whole system by a single point
- (NEW) Fast replacement with memory backup

SLS-M (Master) and up to three SLS-R (Slave) can be connected without need of additional external unit to form a consistent safety system that share safety and warning zones over all devices.
Available functions make it possible to protect static horizontal or vertical applications, as well as moving applications.

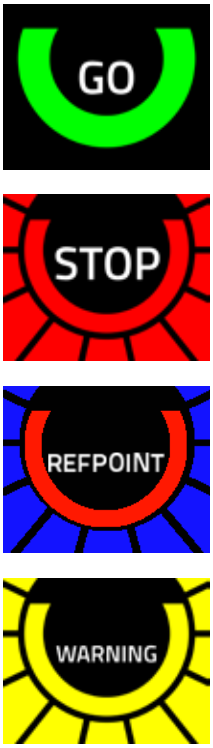


DATALOGIC
EMPOWER YOUR VISION

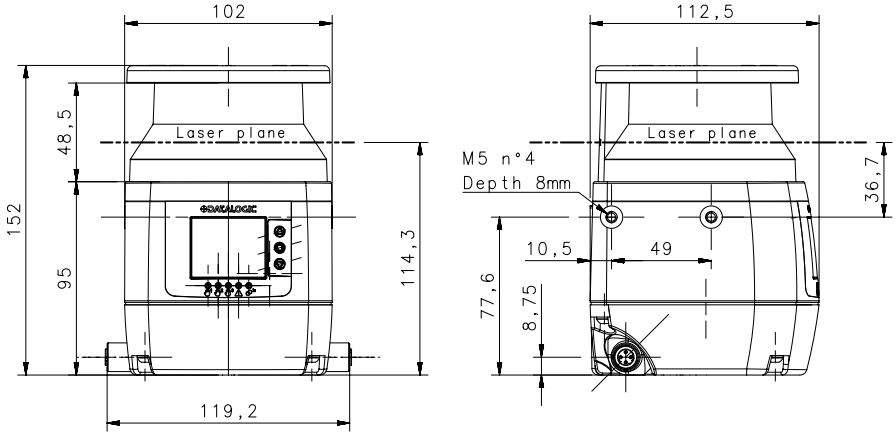
TECHNICAL DATA
MASTER/ SLAVE MODEL (SLS-M/R)

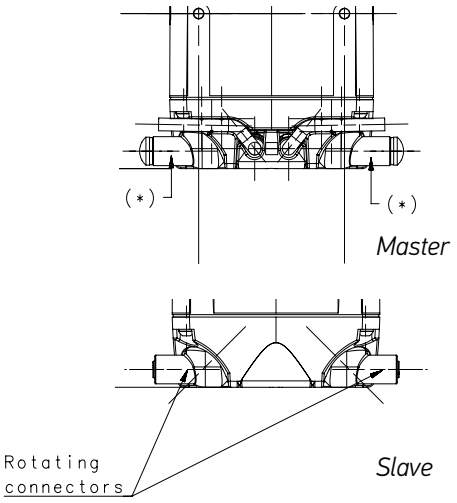
General data	Type (EN61496-1)	3
	PL (EN ISO 13849-1)	d
	SIL (IEC 61508)	2
Detection data	Detection capability	30/40/50/70/150 mm selectable
	Angular resolution	0.1°
	Safety zone operating range	0.05 ... 5.5 m
	Warning zone max operating range	0.05 ... 40 m
	Max. number of simultaneous warning zones	2
	Max. number of simultaneous safety zones	3
	Max. opening angle	275°
	Response time (Configurable)	Min: 62 ms; Max: 482 ms
Electrical data	Power supply (Vdd)	24 Vdc ± 20%
	Safety Outputs (OSSDs)	2
	Output current	0.25 A max / each OSSD
	Capacitive load	2.2 uF @ 24Vdc max
	Configurable Inputs	8pin: 2; 12pin: 4; 17pin: 4; 17+8pin:4
	Configurable Inputs/Outputs	8pin: 1; 12pin:4; 17pin: 6; 17+8pin:14
Mechanical and environmental data	Operating temperature	-10...+50 °C
	Storage temperature	-20...+70°C
	Humidity	15 ... 95 % (no condensation)
	Mechanical protection	IP 65 (EN 60529)
Functions	Manual / automatic restart	
	Dynamic switching between zone sets	
	Warning area intrusion detection	
	Total Muting (T or L)	
	Reference Points	
	Override	
	Muting Lamp	
	Advanced measurement data	
	“Clean Window” alarm	
	Partial dynamic muting	
	Fast replacement	

COLOR INTRUSION DETECTION SYSTEM



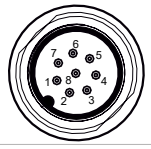
DIMENSIONS





I/O CONNECTOR

CONNECTOR (M12, 8-POLE)

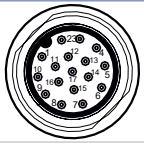


		SIGNAL
POWER	2	POWER SUPPLY
	7	GND_ISO
INPUT/OUTPUT	3	MULTI IN
	4	MULTI IN
	1	MULTI IN/OUT
SAFETY OUTPUTS	5	OSSD11
	6	OSSD12
OTHER	8	F_EARTH

CONNECTOR (M12, 12-POLE)

		SIGNAL
POWER	1	POWER SUPPLY
	4	POWER SUPPLY
	2	GND_ISO
	6	GND_ISO
INPUT/OUTPUT	3	MULTI IN
	7	MULTI IN/OUT
	9	MULTI IN/OUT
	10	MULTI IN/OUT
	11	MULTI IN/OUT
SAFETY OUTPUTS	8	OSSD11
	5	OSSD12
OTHER	12	F_EARTH

CONNECTOR (M12, 17-POLE)



		SIGNAL
POWER	1	POWER SUPPLY
	10	POWER SUPPLY
	11	POWER SUPPLY
	2	GND_ISO
	3	GND_ISO
	12	GND_ISO
INPUT	14	MULTI IN
	7	MULTI IN
	6	MULTI IN
	17	MULTI IN
OUTPUT	4	MULTI IN
	15	MULTI IN
INPUT/OUTPUT	4	MULTI IN/OUT
	15	MULTI IN/OUT
SAFETY OUTPUTS	13	OSSD11
	8	OSSD12
OTHER	16	F_EARTH

CONNECTOR (M12, 17+8-POLE)

		SIGNAL
SPEED INPUT	8-4	MULTI IN SPEED
	8-6	MULTI IN SPEED
	8-5	MULTI IN SPEED
	8-8	MULTI IN SPEED
INPUT	8-3	MULTI IN SPEED
	8-7	MULTI IN
	8-2	MULTI IN
	8-1	MULTI IN

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