Safety Laser Scanner

SafeZone

Description

The SafeZone Safety Laser Scanner is an optoelectronic device that uses the diffuse reflection of emitted infrared light to determine the intrusion of a person or object within a defined area. A rotating deflection unit periodically emits Class 1 infrared laser light pulses over a 300° angular range to create a detection zone which is two dimensional. The reflected light is processed by the SafeZone, which will send a stop signal by switching the state of its safety relay outputs, if it is determined that a person or object is within the predefined detection zone.

Two zones can be created within the maximum scanning range of the SafeZone through the use of the SafeZone's Windows based software. The "Safety Zone" is configurable for a 6m (19.7ft) radius and the "Warning Zone" up to a 7.5m (24.6ft) radius.

The SafeZone can be used in stationary applications for horizontal detection in a defined protection zone, in vertical applications for whole body access detection, and on mobile safeguarding applications—AGVs (Automated Guided Vehicles).

The maximum value of the machine's stopping time plus the SafeZone's response time must be calculated so that no person can gain access to a hazard point before the dangerous motion has ceased.

Features

- 300° scanning angle
- Two programmable zones (Safety/Warning)
- Safety relay outputs
- Robust IP65 housing

Specifications

Standards	IEC61496
Safety Category	Type 3 ESPE acc. to EN 61496-1
Approvals	CE marked for all applicable directives, cULus,
Laser Protection Class	IEC 60825 Laser Class 1 (eye safe)
Measurement & Toler. Range	0 to 7.5m (0 to 24.6ft)
Range for a Safe Detection of Objects the "Nominal Leg"	0 to 6m (0 to 19.6ft) (includes safety supplement)
Protective Field Res. Time	280ms
Maximum Angle	300°
Wavelength	905nm
Pulse Frequency	5.76KHz + 5%
Scanning Frequency	8Hz + 5%
Scanning Angle	300°
Resolution	70mm (2.8in) at 6m (19.6ft)
Point Resolution	0.5°
Vibration	per IEC 2-6, frequency range 10-55Hz, amplitude: 0.35mm
Shock	per IEC 2-29, acceleration 10g, pulse duration: 16ms
Optics (Co-axial Transmitter and Receiver Optics)	
Laser Beam Divergence	15 mrad (0.86°)
Focal Length	30mm (1.18in)
Lens Diameter	30mm (1.18in)
Power Supply	
Operating Voltage	24V DC ± 25% (via a safety insulating transformer acc. to IEC 742)
Switch on Current	2A for 100ms
Power Consumption	24W total
Housing and Environmental Resistance	
Material	Aluminium
Enclosure Rating	IP 65
Weight	3.0kg
Operating Temperature	0°C ... 50°C (32°F to 122°F)
Storage Temperature	-20°C ... 70°C (-4°F to 158°F)
Interfaces	
Data Interfaces to Computer	RS 232: 9600 baud, 8 data bits, 1 stop bit, no parity
Signal Outputs for Warning Field, OSSD 1, OSSD 2	Potential-free relay outputs, max. 2A, max. 30V, purely resistive load, number of operations; 2 million

Product Selection

1. Safety Laser Scanner

Catalogue Number	Description
442L-SSFZN	SafeZone Safety Laser Scanner, 24V DC

2. Cordsets

Catalogue Number	Description		Catalogue Number	Description	
442L-SCPWR	Power & Outputs 5m (16.3ft)	 *View of the Soldered Side of the 8-Pin Socket—Connects to SafeZone. Opposite End Individual Leads Pre-stripped*	**442L-SCCFG**	Communication Cable for Configuration of Zones 5m (16.3ft)	 *View of the Soldered Side of the 14-Pin Socket Configuration Cable—Connects to SafeZone. Opposite End 9-Pin D-Sub Connector*

Pin #	Signal	Explanation	Marking	Colour	Pin #	Signal	Explanation	Direction	Level
1	24V	24V DC supply	+	Brown	A	GND	Ground, RS 232	---	---
2	GND24	Ground	-	Blue	C	RTS	RS 232: Ready to send	Output	24V
3	OSSD 2.1	Relay contact for protective field 2.1	S2	White	E	CTS	RS 232: Clear to send	Input	24V
4	OSSD 2.2	Relay contact for protective field 2.2	S2	Grey	G	TxD	RS 232: Transmit data	Output	24V
5	OSSD 1.1	Relay contact for protective field 1.1	S1	Black	J	RxD	RS 232: Receive data	Input	24V
6	OSSD 1.2	Relay contact for protective field 1.2	S1	Green	L	---	No connection	---	---
7	Warning field 1.1	Relay contact for warning field 1.1	A	Red	M	RES	Reset (active LOW)	Input	24V
8	Warning field 1.2	Relay contact for warning field 1.2	A	Pink	N through U		No connection	---	---
	FE	Functional Ground (Shield)	FE	Thick Black					

Note: The SafeZone Safety Laser Scanner is a Type 3 device with two N.O. relay outputs. In order to attain a Category 3 system, the SafeZone must be connected through a safety relay module which monitors both FSDs.

Product Selection (continued)

3. Safety Relays—Optional

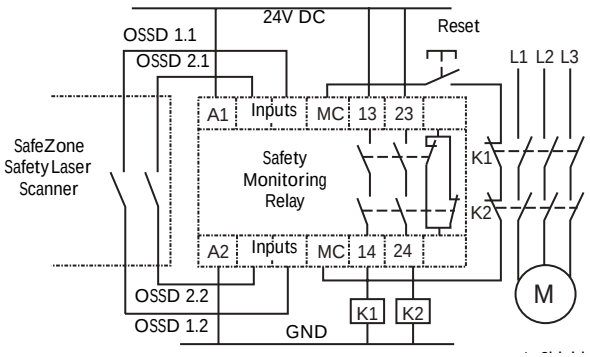
Relay	Input	Safety Outputs	Auxiliary Outputs	Power Supply	Type	Reset	Catalogue Number
 *MSR 126*	Dual Channel (MSR126.1T)	2 N.O.	None	24V AC/DC	—	Automatic/Manual	**440R-N23114**
				115V AC			**440R-N23113**
				230V AC			**440R-N23112**
	Dual Channel (MSR126.1R)			24V AC/DC		Monitoring Manual	**440R-N23120**
				115V AC			**440R-N23119**
				230V AC			**440R-N23118**
 *MSR 127RP*	1NC, 2NC, or Light Curtain or Laser Scanner	3 N.O.	1 N.C.	24V AC/DC	MSR127TP	Automatic/Manual	**440R-N23132**
					MSR127RP	Monitored Manual	**440R-N23135**
				115V AC	MSR127TP	Automatic/Manual	**440R-N23131**
					MSR127RP	Monitored Manual	**440R-N23134**
				230V AC	MSR127TP	Automatic/Manual	**440R-N23130**
					MSR127RP	Monitored Manual	**440R-N23133**
 *MSR 131RTP*	1 N.C. or 2 N.C. or Safety Mat or Light Curtain or Laser Scanner	3 N.O.	2 N.C. 2 PNP Solid State	24V AC/DC	—	Automatic/Manual or Monitored Manual	**440R-C23139**
				115V AC			**440R-C23137**
				230V AC			**440R-C23136**

4. Accessories—Optional

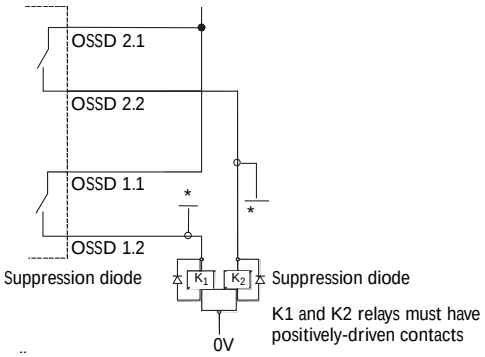
	Products	Catalogue Number
	Power supply: Input—85...265V AC Output—24V DC, 3 Amps	**1794-PS3**

5. Typical Wiring Diagrams

Wiring SafeZone Outputs to a Safety Relay Module



SafeZone OSSDs directly to FSDs (contactors)—Category 1 System



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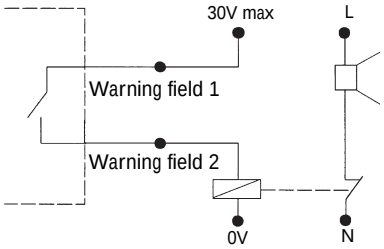
Product Selection

5. Typical Wiring Diagrams (continued)

SafeZone Warning Field Output



Dimensions—mm (inches)