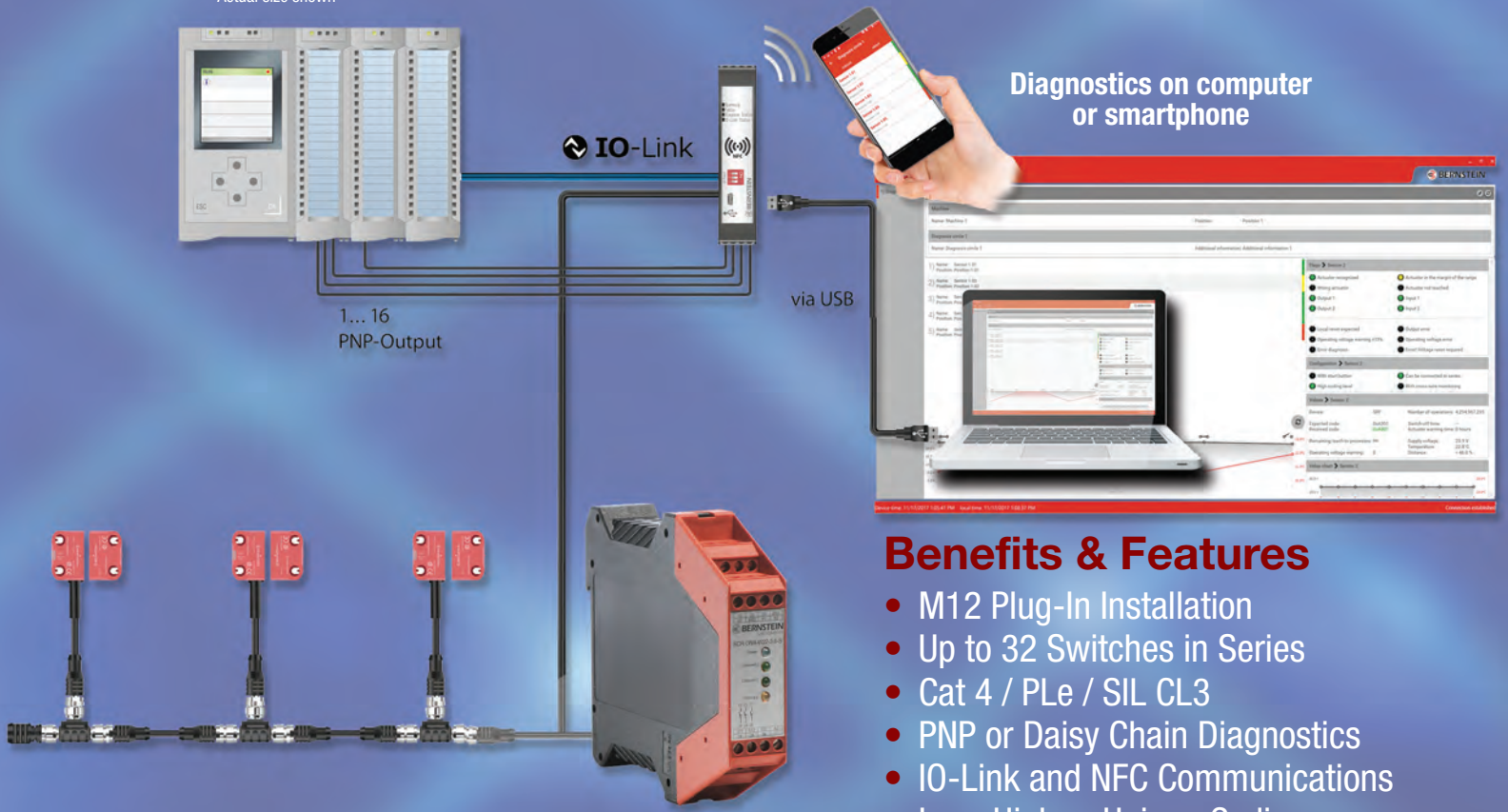
Altech Corp.®
by BERNSTEIN

A Very Smart Choice

The SMART
Non-contact Safety Sensor SRF
With an innovative diagnostic system

- **Very compact:** small in size, flexible in use
- **Very Smart:** suitable for Industry 4.0 with its intelligent diagnostic system
- **Cost Saving:** four-wire unshielded standard connection cable from sensor to sensor
- **Very Safe:** up to PL e – even in series connection with high defeat protection

Actual size shown



Benefits & Features

- M12 Plug-In Installation
- Up to 32 Switches in Series
- Cat 4 / PLe / SIL CL3
- PNP or Daisy Chain Diagnostics
- IO-Link and NFC Communications
- Low, High or Unique Coding
- Protection Class IP69

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The SRF (Safety RFID) is a non-contact safety sensor that monitors movable safety guards, such as doors, gates, panels and hoods.

This compact sensor protects operators from injuries by shutting down or preventing the start up of machines when the safety guards are not properly closed.

Sensor and Actuator

The sensor and actuator feature a compact housing design which has a diagnostic LED and protection rating of IP69. One actuator part number is used for all the coding types and is programmable without additional devices. The actuators are sold separately.

M12 Connection in Series

The sensors are designed to be used in series and feature an M12 connection system which provides plug in installation convenience; saving time, wiring errors and labor. Individual sensors are connected to a "main line" using a "T" connector. The "main line" uses a four conductor unshielded cable, which offers additional cost savings.

Safety Rating

The SRF offers a safety rating of up to PLe, Cat.4 / SIL CL 3 even when multiple switches are used in series, via redundant OSSD outputs.

Diagnostics

There are two different levels of diagnostics available. PNP diagnostics offer a PNP NO output that indicates whether the safety guard is opened or closed. DCD (Daisy Chain Diagnostics) offer much more detailed information providing over 20 different types of diagnostic information, via an internal bus system that can be accessed at the end of the series cable. This data can be accessed by the machine's control system via I/O Link and/or can be displayed on a Android Smartphone or tablet using NFC (Near Field Communication) technology. Both levels of diagnostic systems operate independently of the safety outputs.

Fault Tolerant Outputs

The SRF also offers "Fault Tolerant Outputs", which prevent unnecessary machine shutdowns. If both OSSD safety outputs are lost, caused by an unsafe condition (such as a door being opened) , the machine will immediately shut down. However, if only one output is lost (caused by a fault in the sensor or wiring), the sensor will indicated the condition with a flashing code and transmit the information via the DCD system (if used). After 20 minutes the machine will be shut down.

Local Reset Function

It is possible, with special versions, to install a button to reset the start function of the safety relay near the safety sensor using a "T" connector.

Sensor / Actuator Coding

The sensors are offered with three different coding levels. Low Level Coded sensors are activated with any SRF actuator. High level coded sensors are pair with one specific actuator. Unique level coded sensors can only be paired once. After pairing, the sensor cannot be activated with any other actuator. The pairing procedure does not require any additional equipment.

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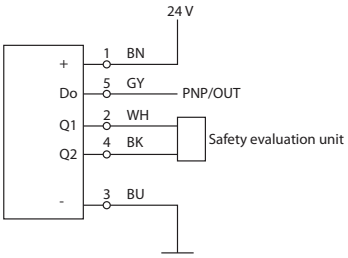
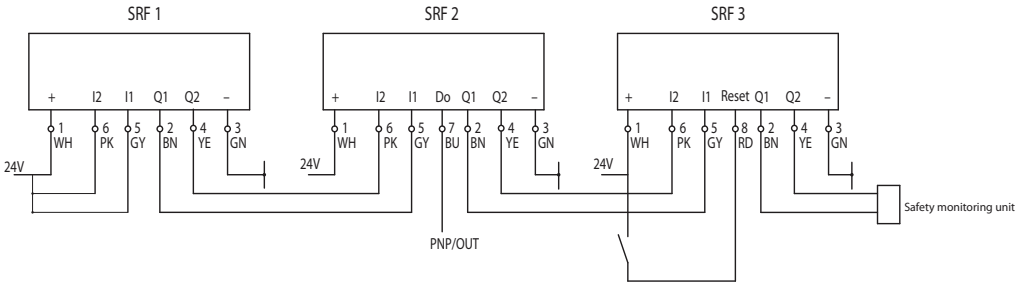
Connection Diagrams

Single Connection



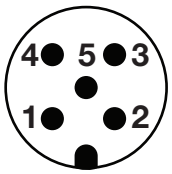
Series Connection



Call Altech for versions with local reset

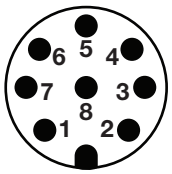
Connector Types

Single Connection From Sensor to Controller



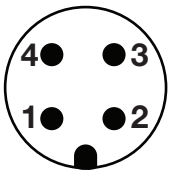
Color Code
1 Brown (24V+)
2 White (OSSD1)
3 Blue (0V)
4 Black (OSSD2)
5 Grey (PNP/OUT)

Series Connection From Sensor to Series Line



Color Code
1 White
2 Brown
3 Green
4 Yellow
5 Grey
6 Pink
7 Blue
8 Red

Series Connection Series Main Line



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Technical Information

Electrical Data		Outputs Q1,Q2	
Rated supply voltage (Ue)	24 V (+25 %, - 20 %)	Voltage level	to Type 3 EN 61131-2
Polarity	Reverse polarity protection	Switching element function	PNP NO
Rated isolation voltage (Ui)	75 V DC	Rated operating current (Ie)	100 mA
Rated impulse withstand (Uimp)	500 V	Leakage current (Ir)	≤ 1 mA DC
Rated conditional short-circuit current	100 A	Switching elements	Sustained short-circuit and overload protection
No-load current (Io)	≤ 50 mA	Voltage drop (Ud)	≤ 3 V
Transponder frequency	125 kHz	Type of short circuit protection	thermal / digital (clocking)
Repeatability (R)	0,1 x Sn	Utilization category	DC-13
Switching frequency	≤ 1 Hz	Output PNP/OUT	
Switch-off delay max (ta)	100 ms+7 ms x following SRF	Rated operating current (Ie)	10 mA
Time (tv)	max. 2 s	Switching elements	Sustained short-circuit and overload protection
EMC	to EN IEC 60947-5-3	Voltage drop (Ud)	≤ 3 V
	& EN 61326-3-1	Type of short circuit protection	current limited
Sensing distances (Only in conjunction with actuator SRF-0		Mechanical Data	
Rated sensi ng distance (Sn)	Typical - 13 mm	Enclosure	PA66 + PA6, red
Assured sensing distance - ON (Sao)	Minimum -10 mm	Tension relief	TPE black
Hysteresis (H)	Typical - 2 mm	Mounting	2 holes Ø 4,5 (for M4 screws)
Assured sensing distance – OFF (Sar)	Maximum - 25 mm	Indication	1×LED red/green operating state;
Safety data			1×LED yellow actuating state
Up to PL (according to EN ISO 13849-1)	PL e	Shock and Vibration	according to EN IEC 60947-5-2
Category	4	Ambient temperature	-25 °C - +70 °C
PFHd (according to DIN EN 62061)	6 x 10-9 1/h	Storage temperature	-25 °C - +70 °C
SIL CL	3	Maximum relative humidity	93 % at 40 °C without condensation
Service life	20 years	Altitude	≤ 2000 m NHN
		Protection type	IP69
		Protection class	III (according to EN IEC 61558)

Keyed Interlock Switches

Safety switches with separate keyed actuators provide a failsafe switch function, indicating the position of guarding access points. These are typically use on hard guarding gates, panels and doors. The switches are normally mounted on the fixed frame of the machine. The actuator key mounts on the door. When the door is closed the key is inserted into the switch, closing the normally closed safety contacts.

Keyed Safety Solenoid Locking Switches

Due to inertia some machines may continue to run after their power is removed. This can create a situation where it is possible to access the hazardous areas of the machine when they are still in a dangerous state. The solution to this problem is to lock the hard guarding access door closed until the machine is given enough time to wind down. The SLK and SLM series have a built in solenoid which can lock (or unlock) the activation key into the switch, preventing the door or gate from being opened.

Safety Hinged Switches

SHS

SHS3

Safety Hinged Switches combine the function of a load bearing hinge with a Category 4 (Ple) rated safety switch. They are easy to install and tamper resistant. Since they do not use an actuation key, there are no alignment or bend radius issues and they cannot be defeated with an extra key. The SHS series is available with 1 NC or 1 Changeover contact. The new SHS3 offers 2 NC/1 NO contacts. Safety Hinged switches are available with the cable attached or with an M12 connector.

Safety Rope Pull Switches

SR Series Plastic Body

SRM Series Metal Body

Safety Rope Pull Switches are designed to provide access to e-stop capabilities over the entire length of the rope. We offers two versions of Safety Rope Pull Switches. The SR has a plastic body and is designed for use with extruded rail systems. The SRM has a metal body and is designed for use in more rugged applications like machine and conveyor systems. These switches may be used to control power circuits directly or as part of a safety circuit chain. They feature a latching operation with manual reset button and optional built in e-stop button. Standard Rope Pull Switches are used to control signals and are typically used for safety and initiation applications.

Learn More @ www.altechcorp.com

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