



SENSORS FOR SAFETY SYSTEMS



For years Pepperl+Fuchs has been a trusted name throughout Europe, offering reliable industrial machine guarding systems on conveyors, palletizing equipment, paint booths, robotic work cells, and many other machine applications. Now, a full range of safeguarding solutions is available throughout North America. From the automotive factory floor and custom machine OEMs, to material handling, and printing and packaging industries, we're helping you to design safety into your plant.

Safety Light Curtains & Grids

Light curtains & grids can be used as area guards, perimeter guards, and machine (point of operation) guards.



SafeBox SB4

The SafeBox system enables the connection of all components of a protection system to a single control unit.



AS-Interface SaW

AS-Interface Safety at Work (SaW) enables networking of safety devices such as safety door switches, e-stops, safety light arrays—using standard AS-Interface networks.

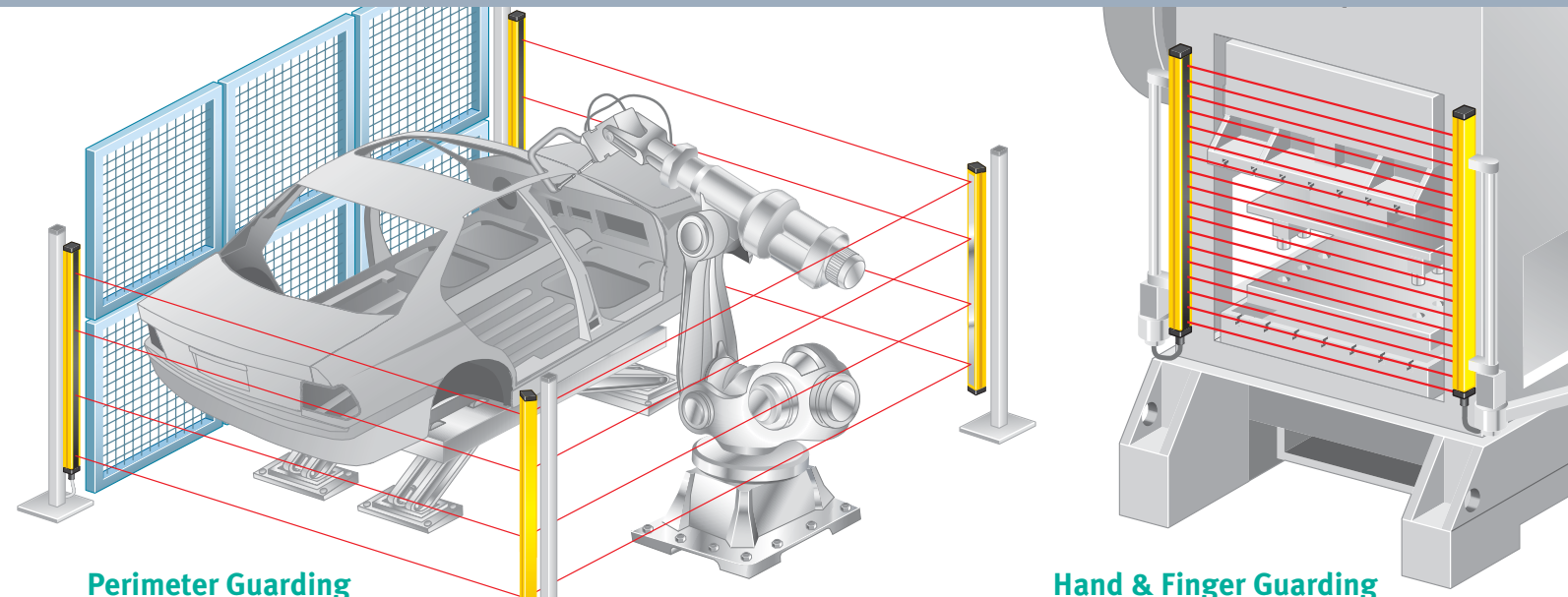


Safety Single-Beam Sensors

Single-beam photoelectric safety sensors are available in rugged, compact housings providing greater mounting flexibility for even the most challenging safeguarding applications.

Ergonomic Safety Palm Button & 2-Hand Controls

When connected according to NFPA and ANSI standards, 2-hand controls guarantee operator-exclusive machine actuation.



Perimeter Guarding

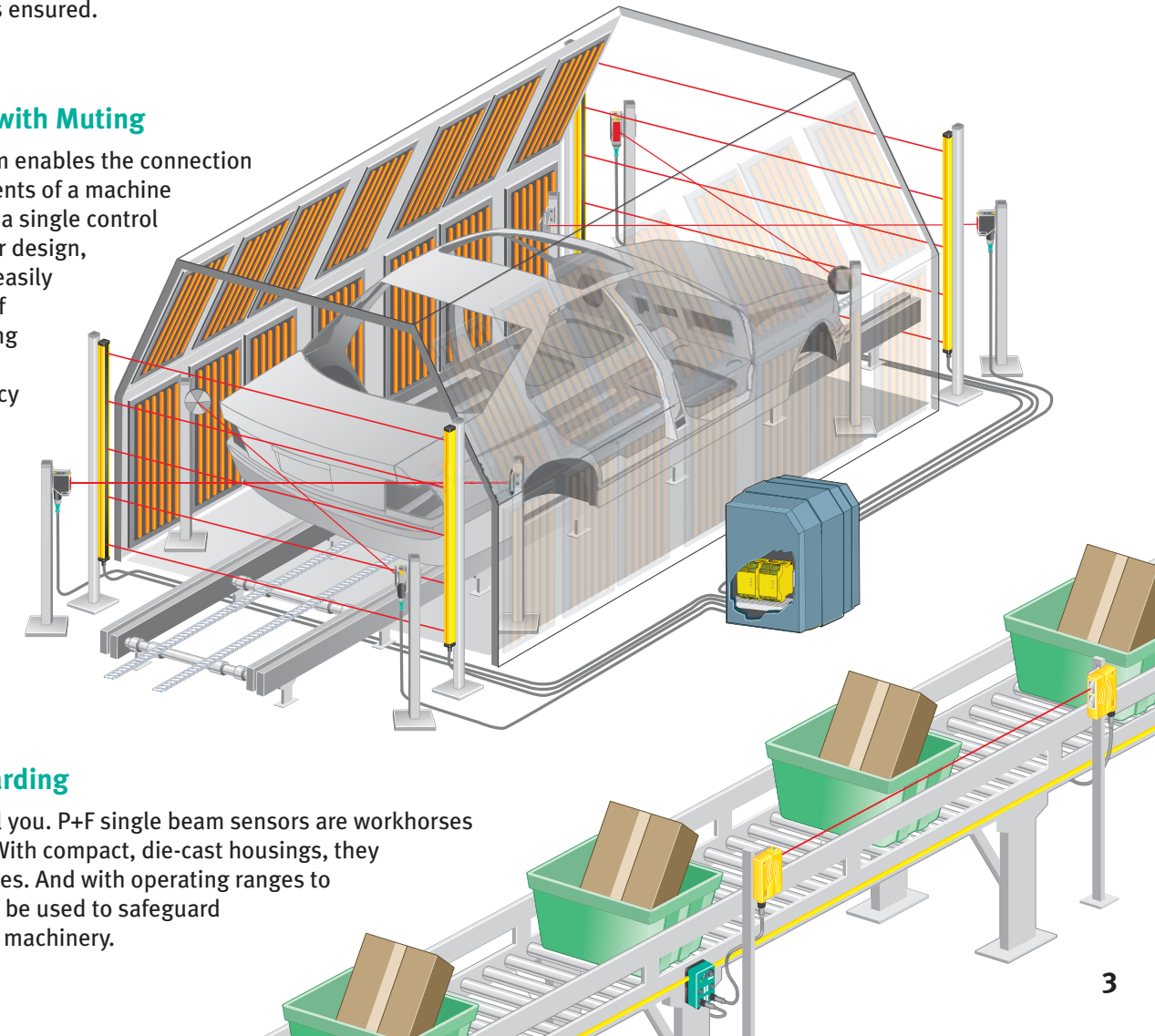
Pepperl+Fuchs' self-monitoring photoelectric safety devices meet Type 4 requirements per IEC/EN 61496 and are suitable for category 4 applications according to EN 954-1. With operating ranges to 20 m, protected heights to 900 mm, and a standard M12 connection for easy installation, reliable perimeter guarding is ensured.

Hand & Finger Guarding

Control the risks of employee injury with the SLC14 and the SLC30 light curtains for finger and hand detection. These self-contained, 2-piece systems can be cascaded with up to 3 light bar segments.

Entry Protection with Muting

P+F's SafeBox System enables the connection of all safety components of a machine protection system to a single control unit. With its modular design, it can be configured easily to fit a wide variety of applications, including entry protection muting and emergency stop functions.



Single-Beam Guarding

Don't let the size fool you. P+F single beam sensors are workhorses on the factory floor. With compact, die-cast housings, they can fit into tight spaces. And with operating ranges to 65 m, they can easily be used to safeguard conveyors and larger machinery.



SAFETY LIGHT CURTAINS



SLC Series



SAFETY LIGHT GRIDS



SLC Series



	Finger Detection SLC14	Hand Detection SLC30
Highlights	<ul style="list-style-type: none"> • Range to 5 m • Cascade up to 3 light bars • 14 mm resolution • External relay monitor option 	<ul style="list-style-type: none"> • Range to 15 m • Cascade up to 3 light bars • 30 mm resolution • External relay monitor option
Resolution (Min. Object Sensitivity)	14 mm	30 mm
Operating Range	0.2 m to 5 m	0.2 m to 15 m
Protected Height	150 mm to 1800 mm	
Dimensions	52 mm x 55 mm	
Safety Type according to IEC61496	Type 4	
Cascade Feature	Master or slave	
Start / Restart Interlock Option	Via DIP-switch selectable	
Enclosure Type	Aluminum extrusion, RAL1021 (yellow) coated	
Optical Face	Plastic; optional protective glass available	
Enclosure Protection Rating	IP67	
Aperture Angle	± 2.5°, per IEC61496	
Transmitter Element	Modulated infrared LED (880 nm)	
Pre-Fault Indicator	Orange LED	
Operating / Storage Temperature	0 °C to +55 °C / -25 °C to +70 °C	
Relative Humidity	Max. 95%, noncondensing	
Supply Voltage	24 VDC, (-30% / +25%)	
No-Load Supply Current @ 24 VDC	Transmitter: < 100 mA, Receiver: < 150 mA	
Response Time	36 ms max. (semiconductor output)	30 ms max. (semiconductor output)
Output Configuration	2 independent 24 VDC PNP monitored channels	
Output Switching Current	500 mA max	
Output Test Pulse	80 µs	
Status Output	1 PNP each for start monitor and OSSD status, 100 mA	
Connection Type	Standard M12 connectors, Receiver: 8-pole, Transmitter: 4-pole	

	Body Detection / Perimeter Guarding		
	SLC-2	SLC-3	SLC-4
Highlights	<ul style="list-style-type: none"> • 20 m range • Self-monitoring • External relay monitor option • Standard M12 connection for easy installation 		
Channel Beam Spacing	500 mm	400 mm	300 mm
Operating Range	0.2 m to 20 m		
Protected Height	500 mm	800 mm	900 mm
Dimensions	52 mm x 55 mm		
Safety Type according to IEC61496	Type 4		
Cascade Feature	Master only		
Start / Restart Interlock Option	Via DIP-switch selectable		
Enclosure Type	Aluminum extrusion, RAL1021 (yellow) coated		
Optical Face	Plastic; optional protective glass available		
Enclosure Protection Rating	IP67		
Aperture Angle	± 2.5°, per IEC61496		
Transmitter Element	Modulated infrared LED (880 nm)		
Pre-Fault Indicator	Orange LED		
Operating / Storage Temperature	0 °C to +55 °C / -25 °C to +70 °C		
Relative Humidity	Max. 95%, noncondensing		
Supply Voltage	24 VDC, (-30% / +25%)		
No-Load Supply Current @ 24 VDC	Transmitter: < 100 mA, Receiver: < 150 mA		
Response Time	10 ms max (semiconductor output)		
Output Configuration	2 independent 24 VDC PNP monitored channels		
Output Switching Current	500 mA max.		
Output Test Pulse	80 µs		
Status Output	1 PNP each for start monitor and OSSD status, 100 mA		
Connection Type	Standard M12 connectors, Receiver: 8-pole, Transmitter: 4-pole		

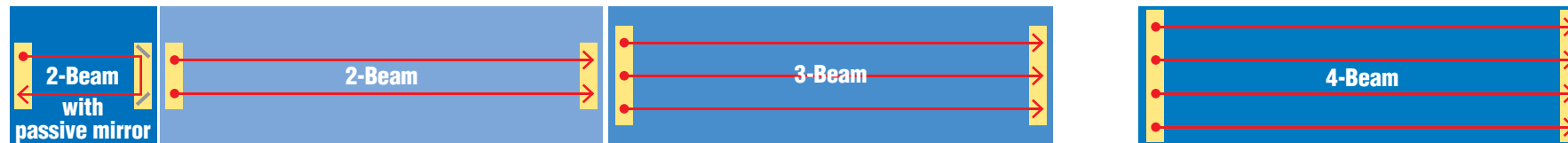


SAFETY LIGHT GRIDS

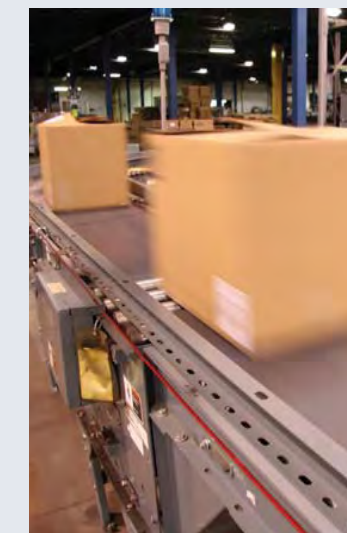
Use with SafeBox



SLP Series



	SLP8-2	SLP10-2	SLP30-2	SLP-65-2	SLP10-3	SLP30-3	SLP-65-3	SLP10-4	SLP30-4	SLP-65-4
Operating Range	0.2 m to 8 m	0.2 m to 10 m	6 m to 30 m	12 m to 65 m	0.2 m to 10 m	6 m to 30 m	12 m to 65 m	0.2 m to 10 m	6 m to 30 m	12 m to 65 m
Channel Beam Spacing		500 mm				400 mm			300 mm	
Protected Height		500 mm				800 mm			900 mm	
Dimensions						64 mm x 70 mm				
Safety Type according to IEC61496						Type 4				
Start / Restart Interlock						Via SB4 SafeBox Safety Controller				
Enclosure Type						Aluminum extrusion, RAL1021 (yellow) coated				
Optical Face						Plastic				
Enclosure Protection Rating						IP65				
Aperture Angle						± 2.5°, per IEC61496				
Emitter Element						Modulated visible red LED (665 nm)				
Pre-Fault Indicator						Flashing red LED per channel				
Operating / Storage Temp.						0 °C to +60 °C / -25 °C to +70 °C				
Relative Humidity						Max. 95%, noncondensing				
Supply Voltage						Via SB4 SafeBox Safety Controller				
Response Time						Via SB4 SafeBox Safety Controller				
Output Configuration						Via SB4 SafeBox Safety Controller				
Output Switching Current						Via SB4 SafeBox Safety Controller				
Status Output						Via SB4 SafeBox Safety Controller				
Connection Type						Terminal compartment				



SINGLE-BEAM SENSORS

Use with SafeBox



SLA Series

	Single-Beam	
	SLA12	SLA29 and SLA29 Long Range
Number of Protection Beams	1	1
Channel Beam Spacing	N/A	N/A
Operating Range	0.2 m to 10 m	0.2 m to 30 m (SLA29) 6 m to 65 m (SLA29 long range)
Dimensions	15 mm x 65 mm x 41.5 mm	25.8 mm x 88 mm x 54.3 mm
Safety Type according to IEC61496	Type 4	
Start / Restart Interlock	Via SB4 SafeBox Safety Controller	
Enclosure Type	Frame: zinc, pressure die-cast Sides: plastic, PC glass: fiber-reinforced	ABS plastic, RLA1021 (yellow)
Optical Face	Plastic	
Enclosure Protection Rating	IP67	
Aperture Angle	± 2.5°, per IEC61496	
Emitter Element	Modulated visible red LED (660 nm)	
Pre-Fault Indicator	Yellow LED on receiver; Red LED in receiver optics	
Operating Temperature	-20 °C to +60 °C	
Storage Temperature	-20 °C to +70 °C	
Relative Humidity	Max 95%, noncondensing	
Supply Voltage	Via SB4 SafeBox Safety Controller	
Response Time	Via SB4 SafeBox Safety Controller	
Output Configuration	Via SB4 SafeBox Safety Controller	
Output Switching Current	Via SB4 SafeBox Safety Controller	
Status Output	Via SB4 SafeBox Safety Controller	
Connection Type	M12 connector, rotatable by 90° or 2.5 m fixed cable	M12 connector or terminal compartment



SAFEBOX SAFETY CONTROLLER

The SafeBox Safety Controller's DIN rail-mounted housing is available in sizes to accommodate 2 to 8 modules, providing application flexibility for up to 32 safety input devices or channels.

SafeBox module types include:

- OR: Relay OSSD module
- 4CP, 4CG, 4XP, 4XG: CPU modules with 4 inputs
- 4C, 4X, 6C: 4- or 6-channel input modules
- 4M: Muting module
- 2E: E-stop module
- Blank covers for spare slots



SafeBox



SafeBox Series

	System Power Supply and Relay Outputs	Input Modules with Microcontroller		Input Modules		Muting Module	E-Stop Module
	OR	4CP 4CG*	4XP 4XG*	4C 6C	4X	4M	2E
Inputs	System reset, system restart, relay monitor	4 channels for SLA12 or SLA29 single beams, or 2-channel safety devices with contact outputs	4 channels for SLP grids, SLC safety light curtains, safety mats or e-stops	4 / 6 channels for SLA12 or SLA29 single beams, or 2-channel safety devices with contact outputs	4 channels for SLP grids, SLC safety light curtains, safety mats or e-stops	4 channels for 2- or 3-wire muting sensors; plus emergency muting override	2 channels for single-channel e-stop devices or 1 dual-channel device; plus relay monitor and restart
Outputs	2 OSSD relay outputs						2 OSSD relay outputs
Voltage	10 - 250 VAC / DC					Supply - 2 V	10 - 250 VAC / DC
Current	Min. 10 mA / max. 6 A AC/DC					7.5 - 500 mA	Min. 10 mA / max. 6 A AC/DC
Max. Switching Power	DC: 24 VA / AC: 230 VA						DC: 24 VA / AC: 230 VA
Displays	Red / green LED for OSSD status, yellow LED for "start-ready" status, numeric display for system diagnostics	Yellow LED status for each channel	Yellow LED status for each channel	Yellow LED status for each channel	Yellow LED status for each channel	Yellow LED status for each muting sensor channel, white LED for status of each muting lamp	Red / green LED for OSSD status, yellow LED for "start-ready" status, yellow LED status for each channel
User-Selectable Functions	Relay monitor Restart interlock	Input pair monitoring for NO/NC antivalent operation Input pair monitoring for simultaneousness	Input pair monitoring for NO/NC antivalent operation Input pair monitoring for simultaneousness	Input pair monitoring for NO/NC antivalent operation Input pair monitoring for simultaneousness	Input pair monitoring for NO/NC antivalent operation Input pair monitoring for simultaneousness	Single / double muting Muting lamp monitor active Sequential / parallel muting Time-limited / protection beam-limited muting	Category 0 stop Category 1 stop Relay monitor Restart interlock
Operating / Storage Temperature	0 °C to +50 °C / -25 °C to +85 °C						
Relative Humidity	Max 95%, noncondensing						
Supply Voltage	24 VDC +/- 20%						
Response Time	30 - 78 ms dependent upon number of modules in group					91 - 230 ms dependent upon number of modules in system	30 - 78 ms dependent upon number of modules in group
Connection Type	Screw terminals, lead cross section 0.2 to 2 mm ²						
Enclosure Protection Rating	IP20						
Housing Material	Polyamide (PA) 6.6, UL94, V0, black						

*4CG and 4XG modules can be used with multiple 2E modules within a single SafeBox system to form switch groups, thus creating multiple independent shutdown zones or a dependent master / local zone safety hierarchy.

SAFETY MONITORS AND MODULES



Safety at Work Overview

AS-Interface Safety at Work (SaW) is a system that enables networking of safety devices (safety door switches, emergency-stop pushbuttons, safety light curtains, etc.) using a standard AS-Interface network. With SaW, users can quickly implement a safety system that satisfies the rules and regulations needed for Category 4 Safety. The simplicity of AS-Interface is retained and is a major reason for users to implement SaW systems.

The following features make Safety at Work unique and powerful:

- Standard I/O and safety information on the same network
- Usable up to Safety Category 4 (SIL 3); satisfies NFPA 79
- Does not require a Safety PLC
- Automatic single SafetyNode replacement is supported
- Safety Monitor allows implementation of powerful safety procedures via graphical drag & drop interface
- Adding safety devices is simple and fast
- Extensive diagnostics over the AS-Interface Network



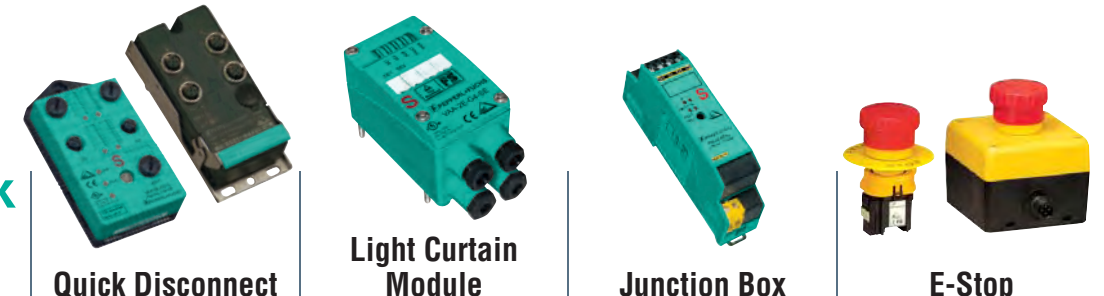
Safety at Work Monitors



Single and Dual Channel

Highlights	<ul style="list-style-type: none"> 1 or 2 inputs and outputs with enhanced programming features
Redundant Safety Outputs	1 or 2
Hardware Functions	
Start Input	■
Status Output	PNP, 200 mA
EDM	■
Service Button	■
RS-232 Port	■
Software Functions	
Configuration Block Memory	48
OR Gates (inputs)	■
AND Gates (inputs)	■
Safe Time Functions	■
Debounce Input	■
Stop Immediate, or Delayed Stop	■
NFPA 79	■
Model	VAS-1A-K12 VAS-2A-K12 VAS-1A-K12-S1 VAS-2A-K12-S1

Safety at Work Modules

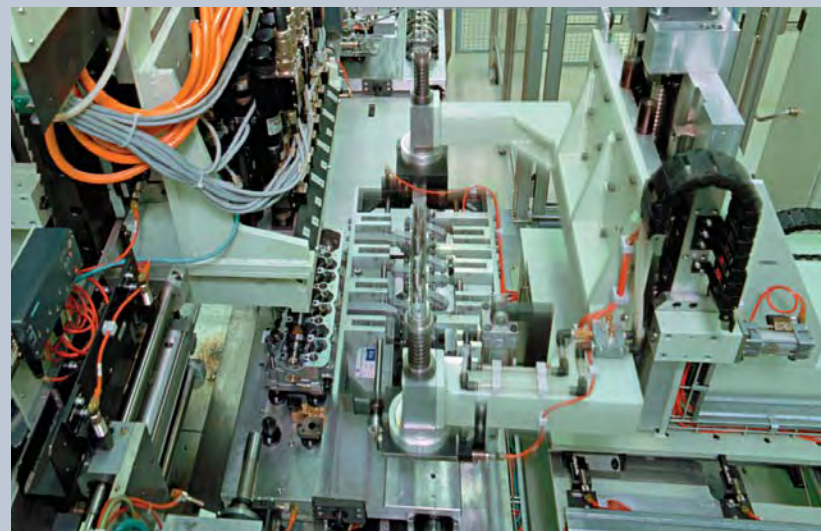


Highlights	<ul style="list-style-type: none"> Outputs can be operated directly by input SPEEDCON option 	<ul style="list-style-type: none"> Vibration-resistant spring terminal Muting sensors or light curtains 	<ul style="list-style-type: none"> Outputs can be set directly by input Low-profile housing 	<ul style="list-style-type: none"> Field or enclosure mounted version Illuminated and nonilluminated versions
Safety Input Type	Dry contact	Electronic PNP	Dry contact	Integrated E-stop
Max. Inputs per Module to Achieve Safety Category 2	2	2	2	
Max. Inputs per Module to Achieve Safety Category 4 (SIL 3)	1	1	1	
SIL 3 Accord to IEC61508	■	■	■	■
NFPA 79	■	■	■	■
Cat 4 Accord to EN 954	■	■	■	■
Protection	IP67	IP67	IP20	IP67
Standard Outputs	2		2	1
Output Type	DC		DC	LED
AS-Interface/Aux. Connection Method	Flat cable through base	Flat or round cable through base	Colored removable terminals	M12 quick disconnect
I/O Connection Method	M12 quick disconnect	Spring terminals	Removable terminals	
Model	VAA-2E2A-G2-S/EA2 VAA-2E-G2-S VAA-2E2A-G12-SAJ/EA2L	VAA-2E-G4-SE	VAA-2E2A-KE1-S/E2 VAA-2E-KE1-S	VAA-2E-PM-S VAA-2E-F85A-S-V1 VAA-2E1A-PM-S VAA-2E1A-F85A-S-V1
Base (sold separately)	U-3FF / included with G12	U-G1FFA, U-G1PP		



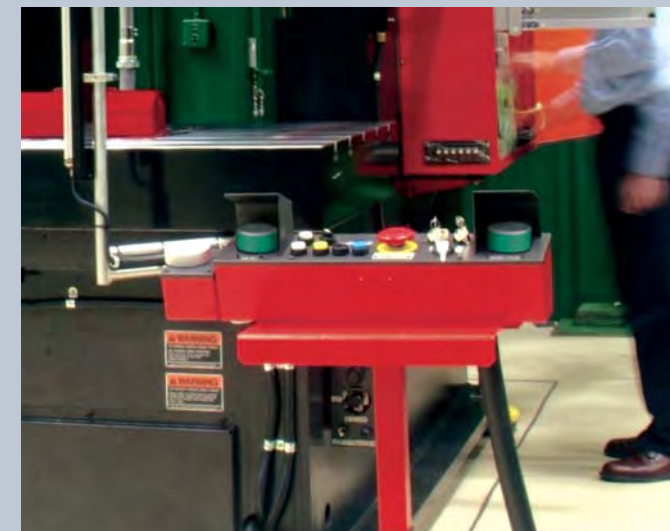
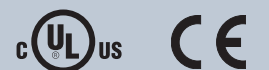
SAFETY RELAYS AND POWER SUPPLIES

Pepperl+Fuchs offers relays, relay retrofits, and power supplies to meet the diverse requirements of your safety system.

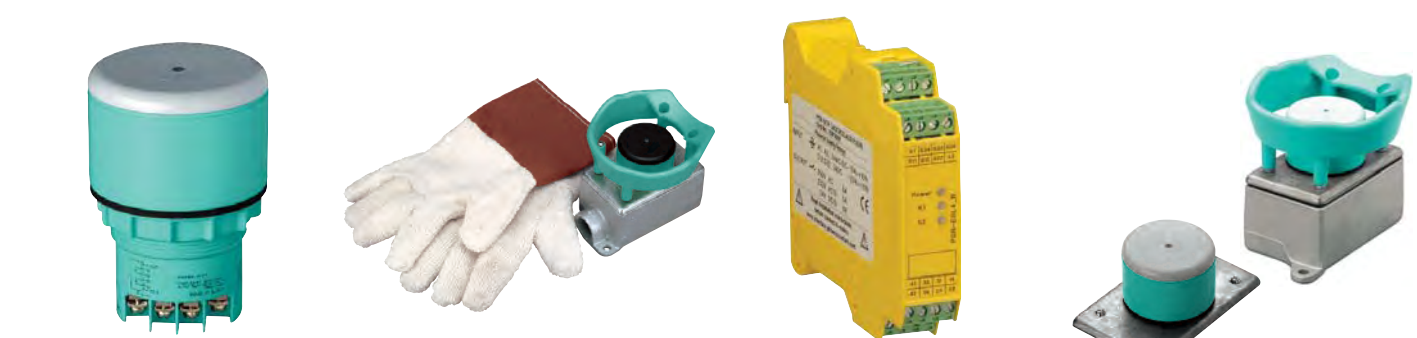


ERGONOMIC SAFETY PALM BUTTONS & 2-HAND CONTROLS

P+F palm buttons offer the industry's best combination of ergonomics and safety. Designed for use with standard 2-hand machine control, P+F safety palm buttons eliminate the possibility of false actuation due to RFI. They require only a light touch to activate and can sense an operator's hands through gloves.

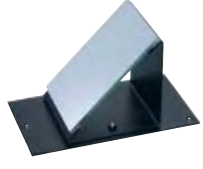









Safety Relay 3NO 1NC	Safety Relay 8NO 1NC	DIN Power Supply	Receiver Power and Relay Adapter	Transmitter Power Adapter
<ul style="list-style-type: none"> • Safety category 4 per EN954-1 • Single or dual channel • 24 VDC / AC • Automatic or manual reset • Screw-clamp terminals • 22.5 mm wide • DIN rail mountable • 3 NO safety contact outputs, 1 NC status contact outputs • UL Listed 	<ul style="list-style-type: none"> • Safety category 4 per EN954-1 • Single or dual channel • 24 VDC / AC • Automatic or manual reset • Screw-clamp terminals • 45 mm wide • DIN rail mountable • 8 NO safety contact outputs, 1 NC status contact output • UL Listed 	<ul style="list-style-type: none"> • Input voltage: 85-264 VAC or 90 to 350 VDC • Frequency range: 45-65 Hz • Output voltage: 24 VDC • Output current: 1 Amp • Screw-clamp terminals • 22.5 mm wide • DIN rail mountable • UL Listed 	<ul style="list-style-type: none"> • Easily retrofits SLC family safety light curtains to applications using 120 VAC power and relay contact outputs • Std. 3-pin mini or micro connector for incoming power connection • Std. 5-pin mini or micro connector for contact output connections • Pigtail M12 cable for connection to SLC receiver • Input voltage: 90-240 VAC • Frequency range: 47-63 Hz • Easily mounts directly to SLC light curtain • 1 NO + 1 NC and 2 NO versions available • UL Listed 	<ul style="list-style-type: none"> • Easily retrofits SLC family safety light curtains to applications using 120 VAC power • Std. 3-pin mini or micro connector for incoming power connection • Pigtail M12 cable for connection to SLC receiver • Input voltage: 90-240 VAC • Frequency range: 47-63 Hz • Easily mounts directly to SLC light curtain • 1 NO + 1 NC and 2 NO versions available • UL Listed







Ergonomic Palm Buttons	High-Sensitivity Ergonomic Palm Buttons	Two-Hand Control Relay	Palm Button Accessories
<ul style="list-style-type: none"> • DC or AC supply • Ergonomic — requires only a light touch to operate • Insensitive to overspray and residue from virtually any cutting fluid or lubricant • Reduces risk of carpal tunnel syndrome and other repetitive motion injuries • Prevents false triggering caused by RFI • Captive-contact relay outputs • Screw-clamp terminals • IP64 rated, Noryl N190 housing • NO and NC contact outputs • UL Listed 	<ul style="list-style-type: none"> • AC supply • Sensitivity adjusted to work through heavy gloves • Insensitive to overspray and residue from virtually any cutting fluid or lubricant • Reduces risk of carpal tunnel syndrome and other repetitive motion injuries • Prevents false triggering caused by RFI • Captive-contact relay outputs • Screw-clamp terminals • IP64 rated, Noryl N190 housing • NO and NC contact outputs • UL Listed 	<ul style="list-style-type: none"> • Safety category IIIC • Cross-circuit detection • DIN rail mountable • 0.5 second simultaneity (anti-tiedown feature) • Screw-clamp terminals • 22.5 mm wide • Dual channel • 2 NO safety outputs, 1 NC status output • UL Listed 	<ul style="list-style-type: none"> • Hub box • Ring guard • Channel guard • Protective cap • Cover plate / gasket • Cover plate • Lock nuts




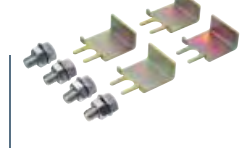

ACCESSORIES FOR SAFETY SINGLE BEAMS



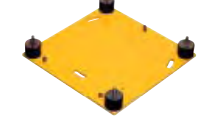


	 Redirection Mirror	 Mounting Bracket	 Mounting Bracket	 Mounting Bracket
Highlights	<ul style="list-style-type: none"> Mirror and bracket for SLA, SLP 	<ul style="list-style-type: none"> SLA29 single beams Anodized aluminum 	<ul style="list-style-type: none"> SLA29 single beams Anodized aluminum Ideal for installations on aluminum extrusion 	<ul style="list-style-type: none"> SLA29 single beams Top - sheet metal Clamping block - aluminum
SLA12	■			
SLA29	■	■	■	■
Model Number	SLA-1-M	OMH-21	OMH-22	OMH-05



	 Mounting Bracket	 Mounting Bracket	 Mounting Bracket	 Mounting Bracket
Highlights	<ul style="list-style-type: none"> SLA12 single beams Top - sheet metal Clamping block - aluminum 	<ul style="list-style-type: none"> SLA29 single beams Top - sheet metal Clamping block - aluminum 	<ul style="list-style-type: none"> SLA12 single beams Large mounting angle for SLA12 single beams Nickel-plated sheet metal 	<ul style="list-style-type: none"> SLA12 single beams Small mounting angle for SLA12 single beams Nickel-plated sheet metal
SLA12	■		■	■
SLA29		■		
Model Number	OMH-06	OMH-07	OMH-MLV12-HWG	OMH-MLV12-HWK

	 Dovetail Mounting Clamp	 Dovetail Mounting Clamp	 Dovetail Mounting Clamp	 Laser Alignment Aid
Highlights	<ul style="list-style-type: none"> SLA29 single beams Aluminum 	<ul style="list-style-type: none"> SLA12 single beams Aluminum 	<ul style="list-style-type: none"> SLA12 single beams Anodized aluminum 	<ul style="list-style-type: none"> SLA29 single beams Includes laser, mounting bracket, foil reflector
SLA12		■	■	
SLA29	■			■
Model Number	OMH-MLV11-K	OMH-K01	OMH-K02	BA SLA28

ACCESSORIES FOR SAFETY LIGHT GRIDS AND LIGHT CURTAINS

	 Redirection Mirrors	 Mounting Bracket	 Protective Glass	 Holder for Protective Glass	 Laser Alignment Aids
Highlights	<ul style="list-style-type: none"> Multidirectional protection SLC safety light curtains and grids SLP grids 	<ul style="list-style-type: none"> SLC safety light curtains SLP safety light grids SLC and SLP mirrors Nickel-plated sheet metal 	<ul style="list-style-type: none"> SLC & SLP Mineral glass panes Weld slag resistant Panels > 1050 mm are segmented (SLC only) 	<ul style="list-style-type: none"> SLC & SLP Mounting brackets for protective glass panes Nickel-plated sheet metal 	<ul style="list-style-type: none"> SLC safety light curtains SLP safety light grids Package includes laser & mounting bracket
SLC	■	■	■	■	■
SLP	■	■	■	■	■
Model Number	SLC--M SLP--M	MS SLC MS SLP	PG SLC-..... PG SLP-.....	PG HOLDER SLC PG HOLDER SLP	BA SLC BA SLP

	 Test Rods	 Floor Stands	 Shock Mount	 Protective Housing	 Muting Mounting Set
Highlights	<ul style="list-style-type: none"> Verify resolution of SLC safety light curtains 14 mm and 30 mm resolution light curtains 	<ul style="list-style-type: none"> For all SLC and SLP light curtains and grids 	<ul style="list-style-type: none"> Shock and vibration damper for SLC/SLP floor stand 	<ul style="list-style-type: none"> For use with SLC/SLP floor stand Maximum height 1050 mm 	<ul style="list-style-type: none"> Attaches SLA29 muting sensors to SLP light grids
SLC	■	■	■	■	
SLP		■	■	■	■
Model Number	TR SLC14 TR SLC30	UC SLC UC SLP	DAMPING UC SLP/SLC	ENCLOSURE UC SLP/SLC	MS SLP/SLA28

	 4-Pole Micro	 8-Pole Micro
Highlights	<ul style="list-style-type: none"> 2 m, 5 m, and 10 m lengths For SLC transmitters with /92 micro connector option 	<ul style="list-style-type: none"> 2 m, 5 m, and 10 m lengths For SLC receivers with /151 micro connector option
Model Number	V1-G-...	V19-G-...

FACTORY AUTOMATION – SENSING YOUR NEEDS



Pepperl+Fuchs sets the standard in quality and innovative technology for the world of automation. Our expertise, dedication, and heritage of innovation have driven us to develop the largest and most versatile line of industrial sensor technologies and interface components in the world. With our global presence, reliable service, and flexible production facilities, Pepperl+Fuchs delivers complete solutions for your automation requirements—wherever you need us.

Contact

Pepperl+Fuchs Inc.
1600 Enterprise Parkway
Twinsburg, Ohio 44087 · USA
Tel. +1 330 486-0001 · Fax +1 330 405-4710
E-mail: fa-info@us.pepperl-fuchs.com

Worldwide Headquarters

Pepperl+Fuchs GmbH · Mannheim · Germany
E-mail: fa-info@de.pepperl-fuchs.com

USA Headquarters

Pepperl+Fuchs Inc. · Twinsburg · USA
E-mail: fa-info@us.pepperl-fuchs.com

Asia Pacific Headquarters

Pepperl+Fuchs Pte Ltd · Singapore
Company Registration no. 199003130E
E-mail: fa-info@sg.pepperl-fuchs.com

www.am.pepperl-fuchs.com

 **PEPPERL+FUCHS**
SENSING YOUR NEEDS