Quick Select Product Guide

Edition 8





Your automation, our passion.



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Preferred-Type Products

What Are They?

Pepperl+Fuchs offers an extensive selection of sensing technologies and products. That's why we've identified hundreds of core items and flagged these on our website as preferred-type products. These are the most commonly ordered products and are typically stocked for quick-ship availability. We designate these products on our website with a green star (\star) to facilitate your product selection.

How to Find Preferred-Type Products

To find a preferred-type product, simply click on **Products** at the top of our webpage...



In addition to providing an overview of our extensive range of products for factory automation, the North American Quick Select Product Guide, Edition 8 offers tips to help you find the right product for your application needs on our website. We've added web page addresses at the bottom of each sensing family table—highlighted in yellow—to increase the flexibility and efficiency of product searches. With just a few clicks, your product choices are quickly narrowed down to products that you can compare for your application needs. ...and scroll down to the sensing technology of interest. Click on that technology, the sensor type, and view our portfolio.

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 Bubscribe to Interface, our Fiel Automation Dirocton e-newslet 	tory Product S	elector Tool Results: 90 Product(s)				

...and look for the green star (\star) , which indicates a preferred-type product.



Need more help?

Call us at 330-486-0001 for advice from engineers who are experts in sensing technology, who are familiar with a wide

range of applications, and who can help solve your most challenging problems.

Visit www.pepperl-fuchs.us or call us at 330-486-0001.

Proximity Sensors



Highlights

- Reliable noncontact detection
- Designed for tough industrial environments
- Sensing ranges to 100 mm
- Over 2000 models available
- Models certified for hazardous location installation



Capacitive Sensors

Capacitive sensors are available in cylindrical and surface mount styles with a choice of AC or DC supply. These sensors provide sensing ranges from 1 mm to 50 mm with some models having potentiometers. A common use is for liquid and granular product detection. NAMUR versions are available for use in hazardous areas.



Basic Series

The Basic Series inductive sensors provide the ultimate combination of accuracy, durability, and economy. Offered in a variety of housing styles, these sensors feature different connection and mounting options. The series is available in 2-, 3-, and 4-wire DC as well as 2-wire AC styles.



X-Series

X-Series offers up to 200% more sensing range than traditional inductive sensors. Models are offered in limit switch, flat pack, or cylindrical housings. The 100+ model product line is available in 2-, 3-, and 4-wire DC as well as AC/DC styles.



Subminiature DC Inductive Sensors

We offer an extensive selection of subminiature, self-contained inductive sensors. Cylindrical versions are available in diameters as small as 3 mm; surface-mount profiles are as low as 4 mm.



Reduction Factor 1 Sensors

With operating ranges of 2 mm to 75 mm, Reduction Factor 1 Series sensors reliably detect all metals at the same operating distance. The extremely durable housing is available in cylindrical and cube styles. Weld-immune versions are offered for rugged production environments.



Pile Driver[™] Series

With a solid, stainless steel housing, Pile Driver[™] is designed for jobs where impact and abrasion are common. For welding environments, Pile Drivers have a tough, Black Armor[™] coating that resists weld spatter buildup.



Inclination Sensors

Using the latest technology in IC-based electromechanical measurement systems, the F99 inclination sensor is used to measure the tilt angle position. Offered in single-axis and dual-axes versions, the F99 provides CANopen, J1939, analog, and switch point outputs with a selectable angle measurement range between 0 to 360°.



Position Measurement Sensors

Our PMI Series of inductive positioning measurement devices are offered in measurement lengths that range from just a few millimeters to one meter. For angular measurement, devices are available with a measuring range of 0 to 360°. In addition to standard analog outputs, these devices offer configurable switch point outputs for limit detection. IO-Link versions are also available.



Ring and Slot Inductive Sensors

Ring sensors are available with thru-hole diameters ranging from 10 mm to 100 mm. Typical applications include wire-breakage monitoring and part-ejection verification. Slot sensors are available in slot widths from 2 mm to 30 mm.



Limit Switch and Flat Pack Sensors

Limit switch inductive sensors mount in the identical footprint as traditional mechanical limit switches. Sensing ranges extend from 15 mm to 40 mm. Flat pack inductive products offer the longest available sensing ranges (50 mm). Both styles are available in multiple output configurations.

Inductive Proximity Sensors

Cylindrical			A STATE	A. C.
	3 mm Diameter	4 mm Diameter	5 mm Diameter	6.5 mm Diameter
Highlights	 Smallest size Smooth barrel Fast switching Stainless steel 	 Smooth and threaded barrels Fast switching Stainless steel 	 NPN, PNP, and NAMUR models Threaded barrel Short housing 	 NPN, PNP, and NAMUR models High switching frequencies Smooth barrel Available in extended range
Sensing Range (Shielded)	0.6, 1 mm	0.6, 0.8, 1, 1.5 mm	0.8, 1.5 mm	1.5, 2, 3 mm
Sensing Range (Unshielded)				3, 6 mm
NAMUR (Intrinsically Safe)				
2-Wire DC				
3-Wire DC			•	
4-Wire DC				
2-Wire AC				
2-Wire AC/DC				
Electrical Connection	Cabled, nano, pigtail	Cabled, nano, pigtail	Cabled, nano	Cabled, nano, micro
Short Housing Models	100 B	100 B		
AS-Interface Compatible				
Reduction Factor 1				
Analog				

To find our preferred parts, go to: www.pepperl-fuchs.us/inductive

Accessories



Mounting Brackets An extensive selection of mounting brackets is available in a variety of materials and mounting configurations to complement our product line.



Rotational Speed Monitor

The KFU8-DW-1.D is easily programmed to monitor for overspeed. It also provides a startup override feature, allowing the relay output to be controlled by an external input to prevent false triggering at startup.



Frequency to Voltage/Current Converter The KFU8-FSSP-1.D is a signal conditioner that converts input frequency pulses to an analog voltage or current signal. It provides isolation for the sensor inputs as well as the analog output.

8 mm Diameter	11 mm/22mm Diameter	12 mm Diameter	18 mm Diameter	30 mm Diameter
 4-way LED available High switching frequencies Shielded or unshielded models Available in extended range 	 Intrinsically safe Smooth plastic Stainless steel threaded barrel available 	 Wide range of wiring options Shielded or unshielded models Available in extended range 2-wire low power 	 Wide range of wiring options Shielded or unshielded models Available in extended range 	 Longer sensing range Shielded or unshielded models Relay output models Available in extended range
1.5, 2, 3, 4 mm	2 mm/6 mm	2, 3, 4, 6 mm	5, 8, 12 mm	8, 10, 15 mm
2, 3, 4, 6 mm	5 mm/10 mm	4, 6, 7, 8, 10 mm	8, 12, 15, 20 mm	15, 20, 25, 30, 40 mm
100 B		100 B	100 B	100 B
		100 B	100 A.	100 B
		100 B		100 B
		100 A.	100 A	100 B
		100 B	100 B	100 B
Cabled, nano, micro	Cabled	Cabled, micro	Cabled, micro, mini	Cabled, micro, mini
		100 B	100 A	100 B
		100 B	100 A.	100 B
100 B		100 B	100 B	100 B
		100 B		100 B

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- Robotics
- ConveyorsMachine tools
- Counting
- Elevators

Inductive Proximity Sensors

Surface Mount		• • •	- P	6
	F79	F41/F141	F29	F76
Highlights	 Smallest housing IP67 16 x 8 x 4.7 mm 5 30 VDC operation 	 Nickel-plated brass housing Narrow housing style 25 x 5 x 5 mm (F141) 40 x 8 x 8 mm (F41) 	 Small, compact housing Corner LED 5 30 VDC operation 	 Small housing 10 30 VDC operation Reinforced mounting hole
Sensing Range (Shielded)	1.5 mm	0.8, 1.5, 3 mm	2 mm	2 mm
Sensing Range (Unshielded)			4 mm	
NAMUR (Intrinsically Safe)				
2-Wire DC				
3-Wire DC	•			100 B
4-Wire DC				
2-Wire AC/DC				
Electrical Connection	Cabled, nano, pigtail	Cabled, nano	Cabled	Cabled

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Accessories



Standstill Monitor The KFD2-SR2-2.W.SM is a zero speed/standstill monitor that accepts input frequency pulses and triggers an output when the frequency drops below a selected level.



Isolated Switch Amplifier The KFA6-SR-2.3L.FA functions as a sensor power supply for min/max control. It also provides an output conversion to form C relay contacts.

		S***	en en	
V3	F1	F33	F104M Pile Driver™	М1К
 Miniature rectangular housing LED status 2-wire low power 	 Fast switching LED status 	 Flat rectangular plastic housing NPN and PNP models Die-cast zinc housing available (F33M) 	 100% stainless steel housing withstands target impacts and abrasion Low, 8 mm housing profile Standard and weld-immune models Power and output LEDs 	 Output status LED Available with analog output 30 x 30 x 91 mm
2, 3 mm	2, 4 mm	5, 8 mm	6 mm	
6 mm	8 mm	10 mm		15 mm
100 A.				100 B
100 A.				
100 A.	•		•	
	•			100 B
100 B	•			
Cabled, nano, terminal connection	Cabled, nano	Cabled	Cabled, pigtail	Terminal connection

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- Actuators
- PositioningPackaging machinery
- Jam protection
- Air or hydraulic cylinder positioning

Inductive Proximity Sensors

Surface Mount	Comments of the second			
	F7/F9/F10/F11	RHINO™	Limit Switch	FPS
Highlights	 Mini cube style Shielded or unshielded models 	 Metal base and bracket High-visibility LEDs Quick-release plastic bracket Weld-immune models 	 Limit switch-style housing Metal or plastic base DC models (4 LEDs) 1/2" NPT 	 Rectangular flat pack 10 65 VDC 20 265 AC/DC NO/NC selectable
Sensing Range (Shielded)	5, 7 mm	20 mm	20 mm	25 mm
Sensing Range (Unshielded)	5, 10, 15 mm	35, 40 mm	40 mm	30 mm
NAMUR (Intrinsically Safe)			•	
2-Wire DC			•	
3-Wire DC			•	
4-Wire DC			•	
2-Wire AC				
4-Wire AC				
2-Wire AC/DC				
Electrical Connection	Cabled, micro	Micro, mini	Mini, terminal connection	Terminal connection
AS-Interface Compatible		100 B		
Reduction Factor 1		100 A	•	

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Accessories



Adjustable Bracket

The adjustable bracket with mounting track is especially designed for limit switch-style sensors. It can be adjusted up to 20 mm along the Y axis and rotated 360° in increments of 1.87°.



Panel Meter

The DA6-IU-2K-V is a multifunction indicator that allows visual display of the connected analog signal. It has two programmable relay outputs for level detection, a scalable 5-digit display, and a 24 VDC/100 mA output supply to power the sensor.

			C s s
Flat Pack	F23	Slot Type	Ring Type
 Flat pack housing Metal base, 1/2" NPT Corner edge LED 	 Longest sensing range IP67 Plastic housing, aluminum base 	 2 30 mm slot widths Highly accurate detection Greater than 1 kHz switching possible with NAMUR 	 10 100 mm ring diameters Greater than 1 kHz switching possible with NAMUR
40, 50 mm			
50, 60, 75 mm	100 mm		
100 B			
100 B			
100 B	•		
100 B			
100 B			
	•		
Micro, mini, terminal connection	Micro, mini	Cabled	Cabled, micro
100 B			
To find ou	r preferred parts, go to	: www.pepperl-fuchs.u	s/inductive





- Can crushing machines
 Doors opening and closing
 Speed detection
 Conveyors
 Part counting

Special Sensors

Cylindrical & Surface Mount	i Ba	je,			
	Pile Driver™	Cylinder Switch	Inclination and Acceleration Sensors	Position Measurement	
Highlights	 "Wear-proof" 100 % stainless steel housing 8, 12, 18, and 30 mm diameter models IP69K washdown rating Extended sensing range 	 End-of-stroke verification in hydraulic and pneumatic Operational pressure ratings to 3000 psi Weld field immune Many standard probe lengths 	 Tilt angle sensing 0 to 360° Analog output 0 5 V, 4 20 mA Programmable switch point and analog range Single- and dual-axis models CANopen, J1939 	 Noncontact detection Analog output 0 10 V, 4 20 mA Programmable switch points 14 mm to 810 mm linear range 0 to 360° rotation sensing range IO-Link 	
NAMUR (Intrinsically Safe)					
2-Wire DC					
3-Wire DC					
4-Wire DC		100 B			
2-Wire AC					
2-Wire AC/DC		100 B			
Electrical Connection	Cabled, micro, mini	Micro, mini	Cabled, micro	Cabled, micro	
CANopen					
J1939					
Analog					
IO-Link					
To find our proferred parts, go to www.papparl fushs us/inductive					

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Accessories



Cylindrical/Rhino Conversion Bracket Designed with the same mounting dimensions as the Rhino[™] style cube sensor.

Rhino style cube sensor

Industry-standard mounting holes



Exchanger Brackets

Change your cylindrical sensor in seconds without losing the original position. Just slide in the replacement sensor, tighten the nut, and you're done.

				OF	and the second s
Sensors for Mobile Equipment	Relay Output	Extended Temperature	Explosion Proof	High Pressure	Magnetic Sensors
 -40 °F +185 °F operational temperature Extended sensing range Heavy cable gauge IP69K rated 100 V/M RF immunity 	 Switch load currents up to 6 A Mechanical shock rating of 150 g Open and closed contacts 	 Operational temperature ratings from -40 °F +486 °F Cylindrical and surface mount housing styles Remote amplifier models 	 UL approved for use in hazardous areas Solid-state components All-metal housings 	 Pressure ratings to 7000 psi 12 mm diameter models 3-wire DC and NAMUR 	 Capable of detection through aluminum Cylindrical and surface mount housings
				-	-
		10 A 10			
Cabled, Deutsch 3-pin	Cabled	Cabled, micro, terminal connection	Cabled	Cabled	Cabled, micro

To find our preferred parts, go to: www.pepperl-fuchs.us/inductive



- Indexing
- Missing parts detectionEdge guide control
- Wire breakage control
- Broken tool detection
- Valve detection

Capacitive Proximity Sensors

Cylindrical & Surface Mount			
	12 mm Diameter	18 mm Diameter	30 mm Diameter
Highlights	 Adjustable sensing range Plastic or metal housing Shielded or unshielded models 	 Adjustable sensing range Shielded version Plastic or metal housing 	 Adjustable sensing range Plastic or metal housing Shielded or unshielded models
Sensing Range	1 8 mm	1 15 mm	1 15 mm
Adjustable Sensitivity	· · · · · · · · · · · · · · · · · · ·	100 A	· · · · · · · · · · · · · · · · · · ·
NAMUR (Intrinsically Safe)			
3-Wire DC (PNP & NPN)			
4-Wire DC (PNP & NPN)			
2-Wire AC			100 A
Chemically Resistant			
Electrical Connection	Cabled, micro	Cabled, micro	Cabled, micro

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Accessories



Sight Glass Mounts

This handy mount enables the use of 30 mm diameter capacitive sensors for level control applications. Just slide the mount over any glass or plastic tube with a 25.4 mm to 44.5 mm diameter. The mount makes it easier to adjust the sensor without disturbing the fluid inside the tank.



Mounting Flanges/Sensor Wells

These sensor wells keep tanks sealed when the sensor is removed. They are made of a durable PTFE or Polyoxymethylene (POM) material and have a 1½" NPT diameter and an M30 diameter well for the sensor.

	3000					
50 mm Diameter	Rectangular Ultra Slim (F46)	Rectangular F64	Limit Switch	Flat Pack		
 Adjustable sensing range Integral switches configure NPN/PNP and N.O./N.C. 	 Fixed range Surface or tie-wrap mounting Plastic housing NPN, PNP models 	 Adjustable sensing range PNP, NPN models Plastic housing M8, M12, pigtail, quick disconnect 	 Adjustable sensing range Limit switch-style housing Shielded model 	 Adjustable sensing range Longest sensing range Unshielded 		
1 30 mm	2, 5, 10 mm	1 15 mm	1 15 mm	5 50 mm		
				100 A.		
				100 A		
				100 A		
Cabled	Cabled	Cabled, nano, pigtail, quick disconnect	Terminal connection	Terminal connection		
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Capacitive Sensors

Pepperl+Fuchs' capacitive sensors can be used to detect nonmetallic objects. These include liquids such as acids and water, as well as granular materials, including grain, flour, and sugar. They are available in several housing styles, including cylindrical, limit switch, and flat pack. Most are made of stainless steel or durable PBT, and feature sensing ranges from 1 mm to 50 mm. They are ideally suited for "point" level control in flat-walled vessels and flow/no-flow indication in plastic tubing. Versions are available with PVDF housings offering chemical resistance and IP68 rating.





Proximity Sensors Accessories

Counters, Timers, and Control	CTTTTTT Demonstation Contraction	12 18 18 18 1 5 10 10 10 10 10 10 10 10 10 10 10 10 10	
	Batch Controller	Batch Controller	Meter Display
Series	KC	КСТ	DA6-IU
Functions	Counter/Timer/Rate	Counter/Timer/Rate	Voltage or 4 20 mA display
Outputs	Relay or transistor	Transistor	Relay
Size	48 x 48 mm	48 x 96 mm	28 x 48 mm, 48 x 96 mm
Features	Presets, counting, ext. reset, add, subtract	Presets, counting, ext. reset, add, subtract	Linearization
Display	LED, LCD	LED	LED

Amplifiers and Controls						
	Signal Converter	Sensor Signal Converter	Sensor Signal Converter	Standstill Monitor	Speed Monitor	Frequency Converter
Series	K23-SSI	KCD2	KCD2	KFD2	KFU8	KFU8
Туре	R2/IU & R2/25B	KCD2-E*	KCD2-R	KFD2-SR2-2.W.SM	KFU8-DW-1.D	KFU8-FSSP-1.D
Functions	R2/25B: SSI to RS232 or parallel R2/IU: SSI to RS232/RS485 or analog	NAMUR to 3-wire DC	3-wire to relay	Low speed/ pulse detection	Speed limit detection	Frequency to voltage/current
Outputs	Serial, parallel, or analog	Relay or transistor	Relay	Relay	Relay	Analog
Mounting	DIN rail	DIN rail	DIN rail	DIN rail	DIN rail	DIN rail
Features	SSI conversion	Sensor interface	Sensor interface	Selectable mode of operation	Start delay, 40 KHz max. input frequency	Isolated inputs, universal power input

Sensor Accessories						-	-
	PTFE Protective Cover	Die-Cast Mounting Bracket	Universal Mounting Bracket	Adjustable Mounting Bracket	Snap Lever Bracket	Right Angle Brackets	Cushioned Mounting Bracket/Blocks
Highlights	 PTFE cap Protects against impact and weld spatter For all 12, 18 and 30 mm diameter sensors 	 Cylindrical sensor mount 1/2" rod clamping style For all 12, 18 and 30 mm diameter sensors 	 Holds all cylindrical sensors 360° rotational positioning in both x & y axis 	 Holds all cylindrical sensors Holds fiber optic cables Diameter size available for 4 mm 30 mm 	 For all 8, 12, 18 and 30 mm diameter sensors Easy sensor mounting with one lever Stop shoulder maintains sensing gap 	 For all 12, 18 and 30 mm diameter sensors Stainless steel construction 	 For all 12, 18 and 30 mm diameter sensors Springloaded bracket absorbs impacts Easy installation

Sensor Accessories		1999 2000 CCR	2 0 9 7 7 9 0			103	
	Conduit Adapters	Exchanger Brackets	Sensor Testers	Sight Glass Mounts	End Stop Adapter	Adjustable Brackets	Mounting Flanges
Highlights	 For all 12, 18 and 30 mm diameter sensors Converts metric-threaded sensors to 1/2" NPT thread 	 Easily remove and install sensors without readjustments For all 12, 18 and 30 mm diameter sensors Stop shoulder maintains sensing gap 	 Tests inductive, capacitive, ultrasonic & photoelectric sensors Small handheld size Models available for DC, AC and AC/DC types 	 For 30 mm capacitive sensors Attaches sensor to sight glass for level monitor Accommodates glass or plastic 25.4 to 44.5 mm diameter tubes 	 For 8 mm shielded inductive sensors Spring-loaded piston triggers sensor Available in 25 and 50 mm lengths 	 For all limit switch style sensors Secures sensor to standard mounting rail Can be rotated 360° in 1.87° increments 	 Capacitive models keep tanks sealed if sensor is removed Made of durable PTFE or Polyoxymeth- ylene (POM) material Ultrasonic unit has thru-hole

Photoelectric Sensors



Highlights:

- Photoelectric technologies
 - Diffuse
 - Retroreflective
 - Thru-beam
 - Fiber optic
 - Color
 - Contrast
 - Luminescence
 - Optical data couplers
 - Light grids
 - Retroreflective area sensors
 - Distance measurement

- Industry-leading background suppression sensors, and Pulse Ranging Technology detect position, not just presence
- IO-Link-enabled sensors provide unparalleled configuration diagnostics and control options
- IP ratings up to IP69K
- Powerful features such as automatic cross-talk protection, 4-in-1 output, high ambient light resistance, and high-visibility-indication LEDs are standard



GLV18/GLK18 Cylindrical Sensors

The GLV18/GLK18 series has all of the features you would expect in a larger, more expensive sensor, yet it comes in a compact, short housing that provides greater mounting flexibility.



R2 and R3 Series

The ultraminiature R2, with M2 mounting, and R3, with M3 mounting, are the smallest, fully self-contained family of photoelectric sensors that we've ever offered. Both series offer a versatile 45° cable exit for mounting flexibility in tight spaces.



R100 Series

Offering multiple mounting styles in a IP69K-rated housing, the R100 series also features a choice of visible red or laser light sources and IO-Link built into every sensor.



R101 Series

Innovative design offers every sensing mode in a single housing style. The series also features a wide temperature range from -40 °C to +60 °C and a choice of LED or laser light sources.



R103 Series

The R103 series provides flexible mounting, offering both 18 mm snout and thru-hole mounting in a compact sensor housing. Available in every sensing mode, including distance measurement, the R103 features an IP69K-rated housing and a wide temperature range down to -40 °C.



LGS Series

Intelligent automation light grid permits simple, PC-free setup using a modern, capacitive touch field. Features of the LGS Series include object identification, height monitoring, beam blanking, and more.



Series 31 Photoelectric Sensors

Our smallest AC/DC photoelectric sensor with a SPDT relay. It is also available in DC voltages with a powerful 4-in-1 output. Unique color-coded front labels easily identify the sensing mode.



SU18 Series

The SU18 series fiber optic sensors are designed with cost, performance, and simplicity in mind. It is available in potentiometer and pushbutton adjustable models. The series is packed with features, including a 4-in-1 output, highly visible LEDs, simple fiber attachment, and high-power or high-speed modes.



SU19 Series

The SU19 series features a 4-digit display, up to 16 kHz switching frequency, gang mounting capabilities with built-in cross-talk protection, and the easy interpretation of values via a percentage display.



PRT Distance Measurement Sensors

Sensors with PRT emit short, high-intensity light pulses and calculate object distance based on the speed-of-light constant and time-of-flight of the reflected light pulses. PRT devices are available for long-range, 1-D, or 2-D distance measurement and detection tasks.



Series 61

This high-performance sensor offers easy setup, strong optical performance, integral timers, an industry-standard footprint, and a 4-in-1 or relay output. It is available in four sensing modes that are easily identified with color-coded front labels.

4-in-1 Output

The 4-in-1 output automatically detects the connected load, so the output either sources or sinks current depending on the load. A single sensor can operate as NPN light on, NPN dark on, PNP light on, or PNP dark on, reducing inventory costs and minimizing wiring time.

Photoelectric Sensors

	KT9 Series	KT11 Series	12GM40 Series				
Highlights	Alternative to fiber optics; wide beam angle	Alternative to fiber optics; wide beam angle	12 mm dia metal housing with sensitivity adjustment				
Background Suppression							
Background Evaluation							
Diffuse Mode	50 mm	50 mm	300 mm				
Retroreflective Mode			2.5 m				
Retroreflective Mode Clear Object Detection							
Thru-Beam Mode	250 mm	250 mm	6 m				
Fiber Optic Mode							
Housing H x W x L (mm)	4 mm dia (35, 45 mm lengths)	M5 dia (35, 45 mm lengths)	M12 dia (45, 55 mm lengths)				
Light Source	Infrared	Infrared	Visible red				
Power Supply	DC	DC	DC				
Output Type	NPN, PNP	NPN, PNP	NPN, PNP				
Automatic Cross-Talk Protection (Non-thru beam)							
Electrical Connection	Nano, cabled	Nano, cabled	Micro, cabled				
To find	To find our preferred parts, go to: www.pepperl-fuchs.us/photoelectric						

Accessories



OMH-VL18 Metal bracket with precision sensor alignment for 18 mm cylindrical sensors.



OMH-ML17-R Rod mount, multi-axis, adjustable bracket for 18 mm cylindrical and snouted sensors.



OMH-ML17-EZ Tool-free rapid mounting accessory for R103 series on conveyor sidewalls.

GLV18/GLK18 Series	V18 Series	R2, R3 Series	MLV12 Series
Most economical 18 mm dia photoelectric; straight and right-angled housings	Rugged metal 18 mm dia family with straight and right-angled housings	Ultraminiature housing; powerful performance	Rugged die-cast metal housing frame
120 mm	120 mm	15, 20, 30, 40, 50, 80 mm	250 mm
		15, 30, 50 mm	150 mm
200, 400, 450 mm	400 mm		
3.5, 4, 5.5, 6.5 m	3.5, 15 m	1, 2 m	450 mm, 5 m, 15 m
2.5 m			3 m
12, 20 m	60 m	1, 2, 10 m	16 m
	100 A		
M18 dia various lengths	M18 dia various lengths	24 x 8 x 11 (R2) 26 x 8 x 14 (R3)	65 x 15 x 42
Visible red	Visible red, laser	Visible red, laser	Infrared, visible red, laser
DC, AC/DC	DC	DC	DC
NPN, PNP, thyristor	4-in-1*	NPN, PNP	4-in-1*
			100 B
Micro, cabled	Micro	Nano, cabled	Micro, cabled

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* See page 21 for information on 4-in-1 electrical output.





- Packaging: form/fill/seal
- Metalforming: broken bit detection
- Material handling: conveyor speed control
- Packaging: label orientation
- Automotive: error-proofing camshaft/transmission parts
- Material handling: product orientation

Photoelectric Sensors

	R100 Series	R101 Series	R103 Series
Highlights	Multiple mounting styles in one housing type, available in every sensing mode	Wide temperature range and choice of LED or laser light source	Compact, cost-effective, industry-standard housing
Background Suppression	300, 350 mm	300, 350 mm	250, 300 mm
Background Evaluation	300, 350 mm	300, 350 mm	250, 300 mm
Diffuse Mode	1 m	1 m	800 mm
Retroreflective Mode	7.5, 12 m	7.5, 12 m	6, 12 m
Retroreflective Mode Clear Object Detection	5 m	5 m	4 m
Thru-Beam Mode	12, 20 m	12, 20 m	10, 20 m
Quasi-Measurement	150 mm	150 mm	120 mm
Measurement	150, 200 mm	150, 200 mm	120, 150 mm
Fiber Optic Mode			
Housing H x W x L (mm)	37.1 x 11 x 21.5	31.9 x 13.9 x 20.5	36.5 x 15 x 26.7
Light Source	Visible red, laser	Visible red, laser	Visible red, laser
Power Supply	DC	DC	DC
Output/Interface Type	4-in-1*, IO-Link	4-in-1*, IO-Link	4-in-1*, IO-Link
Automatic Cross-Talk Protection (Non-thru beam)		100 B	100 A
Electrical Connection	Micro, nano, cabled	Micro, nano, cabled	Micro, nano, cabled

To find our preferred parts, go to: www.pepperl-fuchs.us/photoelectric

Accessories



OMH-RL31-03 Protective shroud bracket with flexible mounting pattern for Series 31 models.



OMH-RL2-S Protective shroud bracket with 360° rotation for VDM28 and Series 28 models.



OMH-MLV12-C, OMH-RL28-C

Weld spatter covers for the MLV12 series, Series 28, and VDM28 series models featuring Black Armor[™] coating and replaceable glass lens.

MLV41 Series	Series 31	Series 28	Series 61
Rugged metal housing; front and rear LEDs; powerful performance	Color-coded front label to identify sensing mode	Low operating temperature; highly visible LEDs; timer versions	 Multipurpose Rugged IP67 housing Integral timers
120, 350, 1500 mm	800 mm	400, 700 mm, 1.5 m, 2 m	500 mm, 2 m
	1.2, 2.5 m		
8 m	9, 12 m	17, 30 m	18 m
4 m		5.6 m	
	30 m	30, 65, 300 m	60 m
	800 mm		
100 B			100 A
60 x 14 x 31	62 x 18 x 35	Varies	92 x 45 x 49
Infrared, visible red	Infrared, visible red	Infrared, visible red, laser	Infrared, visible red
DC	AC/DC, DC	AC/DC, DC	AC/DC, DC
4-in-1*, IO-Link	4-in-1*, relay, IO-Link	4-in-1*, relay	4-in-1*, relay
100 B		100 B	
Micro, nano, cabled	Micro, cabled	Micro, cabled, terminal connection	Micro, mini, cabled

To find our preferred parts, go to: www.pepperl-fuchs.us/photoelectric

* See page 21 for information on 4-in-1 electrical output.





- Packaging: case packing
- Material handling: gate position indication
- Elevators: speed monitoring
- Car washes: long-range capability to blast through steam, soap suds, and spray
- Packaging: detect color variations in product package
- Automotive: detect engine components during assembly

Photoelectric Sensors

	GL2, GL3, GL5 Series	GL Series	RAL Series
Highlights	 Miniature design with high switching frequencies 3- and 4-wire connections; easy mounting Highly visible LED indication Optimized for small part detection 	 Full range of slot widths available Die-cast zinc housing High switching frequency 	 One-piece slot light grid Anodized aluminum housing Optimized for small parts detection
Thru-Beam Mode	1.8, 3.15, 5 mm	10 220 mm	50 150 mm
Fiber Optic Mode			
Housing H x W x L (mm)	Varies	Varies	Varies
Light Source	Infrared	Infrared, visible red	Infrared
Power Supply	DC	DC	DC
Output Type	NPN, PNP	NPN, PNP	PNP
Automatic Cross-Talk Protection (Non-thru beam)			
Electrical Connection	Cabled, 4-pin flat connector	Nano	Nano

To find our preferred parts, go to: www.pepperl-fuchs.us/photoelectric

Accessories



MPZB06 Swivel mounting bracket for Series 61 models. Allows 360° swivel and 19° tilt motion.



Reflector Heater 120 Heated corner-cube reflector for use in temperatures down to -54 °F/-48 °C.



Reflector H85HT Corner-cube reflector rated for maximum continuous temperature of 932 °F/500 °C.

	Retroreflective Area Sensors	Automation Light Grids	Contrast & Color Sensors
Highlights	 More sensing coverage than single beam Cost-effective alternative to light grids 	 Unique touch field permits easy configuration IP67-rated aluminum enclosure Wide variety of field heights and beam spacing options 	 Mark detection; print verification; product positioning Identify minute color variation
Classification	RLG28	LGS 100 3200 mm field height	DK12 (contrast) DF12 (color)
Sensing Distance (max)	4 m	6, 8 m	11 mm
Housing H x W x L (mm)	88 x 26 x 54	Varies x 20 x 31	65 x 15 x 42
Light Source	Visible red (6 beams)	Infrared	Red, green, blue LEDs
Power Supply	DC	DC	DC
Output/Interface Type	4-in-1*	4-in-1*, IO-Link	4-in-1*, IO-Link
Electrical Connection	Micro	Micro	Micro

To find our preferred parts, go to: www.pepperl-fuchs.us/photoelectric

* See page 21 for information on 4-in-1 electrical output.





- Packaging: cartoning
- Material handling: counting product for palletizing
- Elevators: door and cab position
- Food and beverage: missing label detection
- Material handling: stacker cranes and guided trolleys
- Automotive: detect part presence before final body assembly

Photoelectric Sensors

	Luminescence Sensors	VDM18	VDM28
Highlights	 Senses invisible and nearly invisible marks Detects targets regular photoelectric and contrast sensors cannot 	 Short-range laser distance measurement sensor Diffuse mode 	 Pulse Ranging Technology (PRT) for measurement accuracy Medium-range laser distance measurement sensor Diffuse and retroreflective mode
Classification	DK50-UV	VDM18-100 VDM18-300	VDM28-8 VDM28-15 VDM28-50-R
Sensing Distance (max)	190, 254, 330, 609 mm	100, 300 mm	8, 15, 50 m
Housing H x W x L (mm)	65 x 23 x 56	50 x 17 x 50	93 x 26 x 54
Light Source	Ultraviolet	Laser	Laser
Power Supply	DC	DC	DC
Output/Interface Type	NPN, PNP, analog	4 20 mA, PNP, RS485	4 20 mA, 4-in-1*, IO-Link
Electrical Connection	Micro	Micro	Micro

To find our preferred parts, go to: www.pepperl-fuchs.us/photoelectric

Accessories



OMH-LS610-01 Mounting bracket for fine adjustment of LS6xx Series optical data couplers and VDM100 sensors.



IO-Link USB Master Connect IO-Link sensors to a PC USB port for setup and configuration.



PACTWare™ A powerful FDT-based software package that is used as a configuration tool.

	VDM100	Optical Data Couplers	R2000
Highlights	 Pulse Ranging Technology (PRT) for measurement accuracy Long-range laser distance measurement sensor Retroreflective mode 	 Wireless data transfer over long distances Parallel and serial data transfer Replaces slip rings and drag cables 	 Pulse Ranging Technology (PRT) for measurement accuracy User-defined detection fields High angular resolution to detect extremely small objects General purpose 2-D laser scanner
Classification	VDM100-50 VDM100-150 VDM100-300	DAD15-parallel DAD30-serial (RS232, RS422, CL 20 mA) LS230-DA-serial (RS232, RS422, CL 20 mA) LS610-DA-P-serial (PROFIBUS) LS682-DA-(Ethernet)	OBD10M - R2000 OBD30M - R2000
Sensing Distance (max)	50, 150, 300 m	1.5 300 m	0.1 30 m
Housing H x W x L (mm)	Varies	Varies	117 x 106 x 118
Light Source	Laser	Infrared, visible red, laser	Laser
Power Supply	DC	DC	DC
Output/Interface Type	PROFIBUS, INTERBUS, EtherNet/IP, SSI	Varies	4-in-1*
Electrical Connection	Varies	Connectors, terminal connection	Micro

To find our preferred parts, go to: www.pepperl-fuchs.us/photoelectric

* See page 21 for information on 4-in-1 electrical output.



- Packaging: palletization and shrink wrapping
- Material handling: conveyor jam detection
- Elevators: door open/closed monitoring
- Packaging: registration mark detection
- Food and beverage: fill level monitoring

Photoelectric Sensors

Fiber Optic Sensors		Contraction of the second seco
	SU18 Series	SU19 Series
Highlights	 General-purpose fiber optic sensing High-speed or high-power potentiometer Pushbutton controls 	 Advanced fiber-optic sensing 4-digit, user-friendly display Pushbutton controls
Indication	LEDs (2)	LEDs (2), 4-digit display
Sensitivity Adjustment/Teach	Potentiometer (1), Pushbutton (1)	Potentiometer (4)
Timer Function	On delay, off delay	On delay, off delay, 1-shot
Switching Frequency	6 kHz	16 kHz
Fiber Adaptable	•	100 C
Housing H x W x L (mm)	35 x 9 x 55	35 x 9 x 62
Light Source	Visible red	Visible red
Power Supply	DC	DC
Output Type	4-in-1*	4-in-1*
Electrical Connection	Nano, cabled	Cabled

To find our preferred parts, go to: www.pepperl-fuchs.us/photoelectric

 * See page 21 for information on 4-in-1 electrical output.

Accessories



HPF-T022-H Specialty fiber with metal casing designed for label detection.



K-LA03 Fiber-optic lens adapter converges light spot diameter to 0.5 mm.



FEF-PLT1 Long-range, high-power plastic thru-beam fiber-optic cable.



FE-IHSRA3S-... Stainless steel sheathed glass fiber-optic cable with right-angle optics.

Additional Photoelectric Products



Fiber-Optic Cables

- Plastic and glass styles
- Wide variety of sizes and shapes
- High-flex and high-temperature models
- Lens accessories available



Reflectors

- Wide variety of materials, shapes, sizes, and reflectivity
- High/low temperature, microstructure, and a large selection of mounting options
- Self-adhesive reflective tape and foils also available



- Packaging: check weighing
- Material handling: automated guided vehicle location
- Printing: web control
- Elevators: people detection
- Automotive: luminescence sensor detects presence of engine lubricants

Ultrasonic Sensors



Highlights:

- Long-range detection of all solid, liquid, and granular targets
- Sensing ranges to 10 meters
- 12 mm, 18 mm, 30 mm diameter, as well as rectangular housings
- Multiplex and synchronize ability prevents cross-talk
- Discrete or analog outputs
- Special models for double sheet, splice, and label detection
- PTFE and stainless steel models for chemical resistance



UGB Splice Detector

Pepperl+Fuchs ultrasonic splice detectors are designed to sense splices in high-speed applications while ignoring differences in color. Featuring two 18 mm diameter sensing heads, this sensor is compact and easy to mount. Dual outputs indicate both splice and no sheet (air) conditions.



Series 65

Designed specifically to monitor tank levels, the Series 65 offers many application benefits. The low-profile, 30 mm high housing features high-visibility LEDs and a rubber gasket to seal the container opening. Switch point and analog versions are fully configurable via SONPROG software, with sensing distances to 2.5 m.



Double Sheet Detection

Ultrasonic double sheet detection identifies the difference between no sheet (air), single sheet, and double sheets. The standard 18 mm diameter unit detects paper, thin plastics, and foils with weights from 10 g/m² to 2000 g/m². The 30 mm model offers the same features as the standard version while providing a larger (50 ... 150 mm) emitter/ receiver separation and the ability to detect denser materials, such as cardboard or sheet metal.



Series 77 and Series 77S

The miniature Series 77 offers high-end features in a cost-effective design. Available in diffuse, retroreflective, and thru-beam models, it excels in solving applications where optic-based sensors struggle. All units are 100% color insensitive, detect clear objects with ease, and thrive in dusty/dirty environments.



Series L2

The Series L2 features a 5-way quick pivot sensing face and high-visibility LEDs. Switch point and analog outputs monitor distances up to 4 m and are fully configurable with an integral pushbutton or PACTware software.



Series 42

These rectangular sensors are available with sensing ranges from 400 mm to 5 m. This versatile series can be powered by AC or DC supplies and has a relay contact output. Unwanted targets can be suppressed using the built-in beam angle adjustment. Pushbuttons allow easy setup. Top or side-sensing models are offered for different mounting configurations.



M18 Short Barrel

Short-housing model ultrasonics are available with straight or right-angle heads. They are perfect for tight spaces and restricted mounting conditions. Sensor status is easy to see from any angle with 360° viewable LEDs.



Series 70

The Series 70 offers maximum versatility. Sensing ranges from 500 mm to 6 m, PC configuration via RS232, and multiple modes of operation solve a wide variety of applications. Sensitivity, evaluation method, burst time, and more can be adjusted via software. Dual switch point or analog outputs are available for all sensing ranges.



Washdown Series

The Washdown Series features a seamless housing made entirely from 316L stainless steel. Available in analog and switch point versions, it is immune to 1200 psi washdowns and is ECOLAB certified. Sensing distances up to 3 m are fully adjustable via PACTware.



Series 260

The F260 Series features a 10 m, fully adjustable sensing range. Available in SONPROG-configurable analog and switch point versions, this powerful design also offers high-precision, 12-bit resolution.

Ultrasonic Sensors

Cylindrical	State State		
	12 mm Diameter	18 mm Diameter	30 mm Diameter
Highlights	 Smallest cylindrical housing available Analog and switch point models Temperature compensation 	 Selectable beam widths Straight and right-angle sensing heads High-visibility LEDs 	 Up to 6 m sensing range Potentiometer and pushbutton configurable models Expanded control via software interface
Sensing Range	20 120 mm 20 200 mm 50 400 mm	50 300 mm 50 500 mm 70 800 mm 50 mm 1 m 90 mm 1 m	50 500 mm 120 mm 2 m 240 mm 4 m 400 mm 6 m
AC Switch Point Output			
DC Single Switch Point Output			
DC Dual Switch Point Output			100 A
Analog Voltage Output	•	100 B	
Analog Current Output			100 A
Analog Current & Voltage Output			
DC Thru-Beam			
Chemically Resistant			
Hazardous Area Versions			
Electrical Connection	Micro	Micro	Micro

To find our preferred parts, go to: www.pepperl-fuchs.us/ultrasonic

Accessories



Right-Angle Deflector

By deflecting the ultrasonic beam 90° from the sensing plane, right-angle deflectors allow low-profile mounting of 18 mm or 30 mm diameter sensors on tanks, conveyors, etc.



Hazardous Location Ultrasonic Sensors

For hazardous locations, Pepperl+Fuchs provides a $\frac{1}{2}$ " NPT conduit adapter for 30 mm diameter ultrasonic sensors in Class I Div. 2. The fitting is used in conjunction with the stainless steel mounting flange with $\frac{1}{4}$ " NPT threads in Class I Div. 2, Class II Div. 1 & 2, and Class III Div. 1 & 2 areas.

30 mm Diameter AC	Remote Transducer	Washdown-proof	Double Sheet/Label/ Splice Detection	
 AC power 360° LED visibility Fingertip range adjustment 	 Allows mounting in tight locations Dual independent transistor and analog outputs 3 modes of operation 	 1200 psi washdown rating Food-grade 316L stainless steel housing Analog and switch point models 	 Outputs for single sheet, double sheet, and no sheet 18 mm and 30 mm diameter models 	
70 500 mm 200 mm 2 m	50 300 mm 120 mm 1 m	70 800 mm (18 mm dia) 200 mm 3 m (30 mm dia)	Separation: 20 60 mm (18 mm) 50 150 mm (30 mm)	
100 B				
		100 B		
	•			
	•			
	•			
	•			
			100 A	
		100 B		
Mini	Micro	Cabled	Cabled, micro	
To find our proferred parts, go to www.popperl fuebous/ultracenic				

To find our preferred parts, go to: www.pepperl-fuchs.us/ultrasonic





- Fill level detection
- Web loop control
- Positioning
- Collision avoidance
- Conveyor transfer
- Print processes

Ultrasonic Sensors

Surface Mount		Single August	
	Series 42	Series 12	Series 77
Highlights	 AC/DC, top or side sensing with relay output Pushbutton programming 	 Push/pull output 90° connector rotation High-visibility LEDs Teachable 	 Miniature housing 100 % color insensitive, reliable with clear targets Fast switching frequency – up to 50 Hz Simple, intuitive range adjustment
Sensing Range	50 500 mm 90 mm 2 m 240 mm 4 m 400 mm 6 m	50 800 mm	20 250 mm 25 400 mm 0 800 mm
AC/DC Switch Point Output			
DC Single Switch Point Output			100 A
DC Dual Switch Point Output			
Analog Voltage Output			(Frequency)
Analog Current Output			
DC Thru-Beam			
Electrical Connection	Micro, mini	Micro	Nano

To find our preferred parts, go to: www.pepperl-fuchs.us/ultrasonic

Accessories



Mounting Wells Mounting wells are available in a 30 mm diameter durable PTFE material that has a thru-hole for ultrasonic sensing.



Ultrasonic Landing Page

For a complete product overview, including datasheets and informative videos, please visit: http://www.sensing.net/ultrasonics/
I			
Series 77S	Series 260	Series 65	Series L2
 Versatile mounting Pushbutton and IO-Link configurable Synchronization input 	 10 m sensing range Analog current or voltage, w/dual switchpoint (PNP) Potentiometer or software configurable 	 Up to 2.5 m sensing range Low profile – ideal for tank level control Analog and switchpoint outputs 	 Pushbutton or PC configurable 5-way adjustable sensing orientation
50 800 mm	800 mm 10 m	60 500 mm 200 mm 1.5 m 250 mm 2.5 m	35 500 mm 60 mm 2 m 200 mm 4 m
100 B			1 A A A A A A A A A A A A A A A A A A A
	•		
100 B	•		
100 A	•		•
Nano	Terminal	Micro	Micro

To find our preferred parts, go to: www.pepperl-fuchs.us/ultrasonic





Typical Applications

- Fill level detection
- Web loop control
- Positioning
- Collision avoidance
- Conveyor transfer
- Print processes
- Crop sprayers

PosiTrack WCS/PCV/PGV

Absolute Positioning Systems



Highlights:

PosiTrack absolute linear encoder systems use optic technology to provide fraction-of-a-millimeter position feedback in a diverse group of applications.

An Alternative to Rotary Encoders

WCS/PCV systems scan specially coded track or tape to determine the carrier mechanism's position. Because the scanning is optic-based and contact-free, mechanical wear and errors due to misalignment are eliminated.

WCS/PCV systems emulate 512 turn,

1024 pulse-per-revolution encoders and communicate via industry-standard control protocols such as RS485, SSI, DeviceNet, PROFIBUS DP, EtherNet/IP, and parallel (binary or Gray code).

System Options – WCS and PCV

WCS uses a thru-beam infrared LED array to scan a uniquely coded reference rail. It provides +/- 0.4 mm accuracy over travel distances to 1,030 feet.

PCV scans a custom Data Matrix tape using 2-D camera technology. Continuous position feedback to distances of 6 miles is possible, with accuracy to +/- 0.1 mm. Both systems feature read speeds up to 41 ft/s and an ultra-quick response time of a few milliseconds.

PGV – The Optimal Solution for AGVs

The PGV automated guided vehicle positioning system detects different colored route-tracking tape/paint and Data Matrix codes to provide navigation and absolute position feedback with \pm 0.2 mm resolution.

In addition to continuous X, Y position feedback, the PGV provides 360° of angular feedback.

WCS2B and WCS3B Read Heads



WCS2B read heads feature a 10 mm slot width. The close proximity of emitter and receiver LEDs yields a high excess gain, making the WCS2B the best choice for dirty environments such as galvanizing facilities, foundries, and steel mills. The WCS3B read head features a 31 mm slot width. Thus, in stand-alone mounting, its read head/rail alignment is more forgiving than the WCS2B. WCS3B systems are ideal for monitoring overhead or floor-based conveyors, automated warehouse equipment, and lift/lower stations.



Control Interfaces

If the WCS read head's integral RS485, SSI, EtherNet/IP, PROFINET, or CANopen outputs don't suit your interface needs, there are several additional options. Control interfaces are available that convert the RS485 signals to most standard network protocols including DeviceNet, PROFIBUS DP, and MODBUS RTU. In addition, RS485-to-parallel converters and SSI controllers that enable extra-long, noise-free cable runs are also available.



Code Rail

WCS code rail is available in fiber laminate or stainless steel and provides a unique positional code every 0.8 mm of read head travel. General-purpose environments best suit the fiber-laminate material, while those requiring increased mechanical rigidity or corrosion immunity utilize the stainless type. All rail types can be horizontally curved with no effect on the read head's accuracy.



PCV Read Head

The PCV read head uses a noncontact 2-D camera and LEDs to read and decode position and identification codes on self-adhesive code tape. Unlike laser beams, the camera can read along small curve radii as well as inclines and declines. Maximum travel speeds of 12.5 m/s are possible. It's available in SSI, PROFINET, CANopen, EtherNet/IP and RS485 protocols.



PCV and PGV Positioning Tape

The PCV or PGV system replaces the code rail with a positioning tape that is a chemically resistant, self-adhesive strip with Data Matrix codes. It's available in lengths up to 6 miles and in versions with 1, 2, or 4 rows of Data Matrix codes for reliable vertical and horizontal position feedback. The majority of the code squares can be damaged or obscured without loss of readability. Temporary replacement code strips are easily generated from any printer using an online program.



PGV System

The PGV automated guided vehicle positioning system is the only product offering a combination of navigation, identification, and absolute position feedback in one device. It uses a 2-D camera to scan both routing tape strips and data matrix codes to provide navigation and absolute position feedback with \pm 0.2 mm resolution. The X and Y position, speed, and vehicle turn angle, together with the operating status are accurately contolled at all times.

WCS – Absolute Positioning System

Read Heads					
Description	WCS2B	WCS3B			
RS485 (62.5 kBaud)	WCS2B-LS221	WCS3B-LS221			
RS485 (187.5 kBaud)	WCS2B-LS211	WCS3B-LS211			
RS485 Direct (19.2 kBaud)	WCS2B-LS246	WCS3B-LS246			
SSI Direct – Binary	WCS2B-LS310	WCS3B-LS310			
SSI Direct – Gray Code	WCS2B-LS311	WCS3B-LS311			
EtherNet/IP	-	WCS3B-LS510			
PROFINET	-	WCS3B-LS610			
With Heating Element	Add suffix "H" to any model number				
With Overspeed Output	Add suffix "S" to any model number				
With Display	Not available	Add suffix "D" to any model number			

To find our preferred parts, go to: www.pepperl-fuchs.us/positrack

Network and Control Interfaces

	And					
WCS-DG210	WCS-PNG210	WCS-EIG310	WCS-PG210E	WCS-IS310	WCS-IP110	
DeviceNet	PROFINET	EtherNet/IP	PROFIBUS DP	SSI – binary	Parallel – binary	
		Use read head mo	del: WCS_B-LS221			
To find our preferred parts, go to: www.pepperl-fuchs.us/positrack						

WCS2B Track System Mounting



WCS3B Track System Mounting

				· • •
WCS3-PS1-8FT	WCS3-MC1	WCS3-MH	WCS-MF1	WCS3-FT1
Code rail support track	Track interconnect plate	Track mounting brackets	Compression tubing	Code rail installation tool

Angle Bracket Systems



Code Rail

WCS2-CS55-L1	WCS3-CS70-L1	WCS2-CS55-M1		WCS3-CS70-M1	
		Stainless Steel			
The best choice for mo offer low cost, eas	The best choice for environr rails offer immunity to liqu resistance	The best choice for environmentally challenging installations, stainless steel code rails offer immunity to liquids, steam/high temperatures, excellent corrosion resistance high rigidity, and tensile strength			

PCV – Absolute Positioning System

			Listasses and				Oth
Read H	ead		Code Tape	Event Markers	Serial Interfa	ce Adapters	Vision Configurator Software
Model	PROFIBUS	PCV80-F200-B6-V15B PCV100-F200-B6-V15B-6011	PCV**M-CA20-0 ** =Tape length	PCV-CM20- *** *** = Marker number	RS485	PCV-USB-RS485- Converter	
	PROFINET	PCV50-F200-B17-V1D PCV80-F200-B17-V1D PCV100-F200-B17-V1D-6011	(meters)				
	RS-485	PCV80-F200-R4-V19 PCV100-F200-R4-V19 PCV100-F200-R4-V19-6011			SSI	PCV-KBL-V19-STR-USB	
	SSI	PCV50-F200-SSI-V19 PCV80-F200-SSI-V19 PCV100-F200-SSI-V19-6011			EtherNet/IP		
	CANopen	PCV80-F200-B16-V15 PCV100-F200-B16-V15-6011			PROFINET		
	EtherNet/IP	PCV50-F200-B25-V1D PCV80-F200-B25-V1D PCV100-F200-B25-V1D-6011					
High- lights	PCV100-F200-B25-V1D-6011 Up to 12.5 m/s (41 ft/s) maximum speed 50 mm scan distance +/- 25 mm 80 mm scan distance +/- 15 mm 100 mm scan distance +/- 20 mm 100 mm scan distance +/- 40 mm (6011) 3 PNP switching outputs Pushbutton or software configurable X, Y, speed feedback		 10 m, 20 m, 50 m, and 100 m Self-adhesive Suitable for -40 °C +150 °C ambient conditions Chemically resistant polyester laminate 1, 2, or 4 row tape available Temporary replacement sections can be generated from a standard home/ office printer 	 Used in conjunction with positional code tape Provides a marker number for generating a control signal Available numbers from 001 999 	 PCV-to-P(parameter Power sup Plugs into Allows eas Vision Cor 	C interface for serial modifications oply included USB port sy interface with figurator Software	 Configuration software for PCV read head Downloadable from Pepperl+Fuchs' website

To find our preferred parts, go to: www.pepperl-fuchs.us/positrack



Overhead cranes rely on WCS/PCV for "X" and "Y" positional tracking as well as prevention of skewing.



WCS/PCV provides continuous positional feedback of the car body throughout the assembly process.





WCS/PCV provides precise, contact-free position and speed feedback in elevators and lifts.



WCS/PCV linear feedback ensures material handling system transfer cars allocate their pallets to the correct conveyor.

PGV – Position Guided Vision



To find our preferred parts, go to: www.pepperl-fuchs.us/positrack



AGV movement is controlled by scanning tapes and painted strips.



Seamless scanning of damaged strips.

		<u>O</u> M	\mathbf{i}			
Serial I	nterface Adapters	Vision Configurator Software	Cordsets & Connectivi	ty		
Model	PCV-USB-RS485 - Conversion set PCV-KBL-V19-STR-RS485		V19-G-**M-PUR-ABG ** = Length (meters)	V15-G-2M-PUR-CAN- V15-G CANopen	V15B-G-2M-PUR- ABG-V15B-G PROFIBUS	V19-G-ABG-PG9
High- lights	 PGV-to-PC interface for serial parameter modifications Power supply included Plugs into USB port Use with Vision Configurator Software 	 Configuration software for PGV read head Downloadable from Pepperl+Fuchs' website 	 Molded M12 female cordset (8-pin) 2-, 5-, and 20-meter models available from stock For connection to PCV80 and PCV100 reader heads Polyurethane jacket Braided shield 	 Molded M12 CANopen bus cordset PUR jacket 5-pin, 2 m Immune to vibration, with mechanical latching 	 Molded M12 PROFIBUS bus cable PUR jacket 2-pin, shield attached to coupling nut Data transmission up to 12 MBit/s 	 8-pin, M12 female connector Attach your own preferred cable Contains grounding clamp Accepts cable diameters from 5 mm 8 mm

To find our preferred parts, go to: www.pepperl-fuchs.us/positrack



Turn angle feedback. Provides smooth navigation.



Data matrix control codes initiate decisions at work stations and "Y" branches.

Rotary Encoders



Highlights:

- Magnetic and optical encoder technology for harsh industrial environments
- Incremental encoders up to 50,000 pulses per revolution
- Absolute encoders up to 32 bit resolution
- Industry standard sizes 50 mm, 58 mm, 2.5", and 78 mm
- Solid shaft, hollow shaft, and recessed hollow shaft models
- Wide variety of configurations available
- Encoders for hazardous areas
 - Safety-rated encoder
 - Encoder for high shaft loads



MNI20/MNI40

These magnetic encoders achieve high-accuracy feedback. This two-piece design enables the magnetic code wheel to mount directly to a machine shaft.



TVI40/THI40/TSI40

These solid, hollow, and recessed hollow shaft models are our smallest, most economical incremental encoders. With a diameter of only 40 mm (1.57"), they can fit in the tightest spaces. The tangential cable exit allows the cable to be positioned either axially or radially.



RVI25

The RVI25 is a rugged, industry-standard, 2.5" incremental encoder with a wide variety of options and resolutions up to 5,000 ppr. Multiple flange types and connection options, including MIL-SPEC connectors, make it simple to integrate. Available with 1⁄4" and 3⁄8" shaft sizes.



RVI58/RHI58

RVI58/RHI58 encoders are available with resolution up to 50,000 ppr for precise positioning applications. Shaft bore sizes on the RHI58 include 10 mm, 12 mm, and ½". Solid shaft models are available with 6 mm, 10 mm, or 12 mm shaft diameters.



RHI90

This large, hollow-shaft incremental encoder can be used for shaft sizes ranging from 16 mm to 45 mm, including 5/8", 3/4", 7/8", and 1". It provides resolutions up to 50,000 ppr.



ENI11HD

For demanding applications in steel mills, shipbuilding, cranes, and offshore environments. The ENI11HD heavy-duty incremental encoder provides reliable feedback for large asynchronous motors and is capable of handling the higher shaft loads, vibration, shock, temperature, and IP protection that is needed in these demanding environments.



36M Series

The 36M series is a CANopen, J1939 SSI, and analog magnetic absolute encoder. It has a small, 36 mm diameter housing with different mounting options available. This encoder is ideal for applications that have space-restricted areas such as renewable energy and packaging machines.

42H Series

The 42H series has different protocols available. They include analog, CANopen, SSI, and J1939. This single-turn or multiturn magnetic absolute encoder has an all stainless steel housing. The 42H series has high shaft load capacity, high vibration, and high shock resistance with excellent environmental protection. For these reasons, the 42H series is best suited for harsh environments, which include mobile equipment applications.



ENA36, ENA42, and ENA58 Series

The ENA36, ENA42, and ENA58 Series magnetic absolute encoders have <0.1° accuracy. Pepperl+Fuchs magnetic rotary encoders can be used in a wide variety of applications because the technology offers precision, robustness, reliability, and a compact housing. The protocols available are analog, SSI, J1939, CANopen, EtherCAT, PROFINET, and PROFIBUS.



E**58, A**58, B**58, C**58, D**58, P**58

Optical absolute encoders with <0.01° accuracy are available for machines and applications that require this higher accuracy. Many protocols are available, such as EtherNet/IP, PROFINET, TCP/IP, PowerLink, SSI, AS-Interface, CANopen, DeviceNet, and PROFIBUS. There are many options to choose from, including solid shaft, recessed hollow shaft, single-turn, and multiturn absolute encoders.



Hazardous Area Encoders

The 78E series is an absolute encoder with an Ex d flameproof housing and a choice of PROFIBUS, SSI, CANopen, and DeviceNet protocols. It has a removable housing for easy configuration and flexibility for your installation. In addition to the 78E series, there is the RVI84 incremental encoder series with intrinsic safety. The RVI58X and RSI58X have non-incendive installation approvals, and the RVI70 incremental encoder has Ex d housing and IECEx approval.

Incremental Rotary Encoders

	<u>A</u>	0	S	E Com		37	6
	MNI20 Magnetic	MNI40 Magnetic	TVI40	TSI40	THI40	TVI50	RVI50
Diameter	20.44 mm, 31.70 mm	31.7 mm, 40.6 mm, 45.7 mm	40 mm	40 mm	40 mm	50 mm	50 mm
Max PPR	5,000	7,200	1,024	1,024	1,024	1,024	2,500
Shaft Type	Mag wheel	Mag wheel	Solid	Recessed hollow	Hollow	Solid	Solid



	TVI58	ТНІ58	RVI58	RSI58	RHI58	RVI58L Stainless Steel
Diameter	58 mm	58 mm	58 mm	58 mm	58 mm	58 mm
Max PPR	1,500	1,500	50,000	50,000	50,000	5,000
Shaft Type	Solid	Hollow	Solid	Recessed hollow	Hollow	Solid



	RVI25 Square Flange	RHI90	RVS58 Sine-Cosine	RHS58 Sine-Cosine	RHS90 Sine-Cosine	ENI11HD
Diameter	2.5 "	90 mm	50 mm	58 mm	90 mm	108.5 mm
Max PPR	5,000	50,000	2,048	2,048	2,048	2500
Shaft Type	Solid	Hollow	Solid	Hollow	Hollow	Hollow/ recessed hollow

To find our preferred parts, go to: www.pepperl-fuchs.us/encoder

Accessories



Couplings

- Spring steel coupling 9401
- Spring disk coupling 9404
- Bellows coupling 9409
- Precision coupling 9410
- Helix coupling KW



Connectors Encoder mating connectors and cordsets available

Magnetic Absolute Rotary Encoders, Cable Pulls

Magnetic Absolute Rotary Encoders	A Service	-	2		W
SSI		AVS36M/AVM36M	ENA36	ENA42	ENA58
CANopen		CVS36M/CVM36M	ENA36	ENA42	ENA58
Analog Current		IVS36M/IVM36M	ENA36	IVM42H/ENA42	
Analog Voltage		UVS36M/UVM36M	ENA36		
J1939	JSM36M	JVM36M/JVM36H	ENA36	JVM42H/ENA42	
EtherCAT PROFINET PROFIBUS					ENA58
Encoder Type	Absolute	Absolute	Absolute	Absolute	Absolute
Diameter	36 mm	36 mm	36 mm	42 mm	58 mm

To find our preferred parts, go to: www.pepperl-fuchs.us/encoder



Accessories



Measuring Wheels

- Circumference 200 mm / 500 mm
- Smooth TPE MW9108 / MW9101
- Dimpled rubber MW9109 / MW9102
- Knurled aluminum MW9110 / MW9103
- Knurled TPE MW9113 / MW9112

Optical Absolute Rotary Encoders and Safety Encoders



To find our preferred parts, go to: www.pepperl-fuchs.us/encoder



To find our preferred parts, go to: www.pepperl-fuchs.us/encoder

Safety Encoder	(a) the
Sin/Cos	RVS58S
Encoder Type	Incremental
Diameter	58 mm
To find ou	r preferred parts, go to: www.pepperl-fuchs.us/encoder

Hazardous Area Rotary Encoders

Incremental Rotary Encoders		o	3
Diameter	58 mm	70 mm	78 mm
Series	RVI58X/RSI58X	RVI 70	RVI84
Max PPR	5,000	5,000	25
Ignition protection class	Zone 2/22	Ex d	Ex ia

To find our preferred parts, go to: www.pepperl-fuchs.us/encoder

Absolute Rotary Encoders	0			
Diameter	58 mm	58 mm	78 mm	
PROFIBUS	PSS58X/PSM58X	PVS58X/PVM58X	PVM78E	
SSI			AVM78E	
CANopen			CVM78E	
DeviceNet			DVM78E	
Ignition protection class	Zone 2/22	Zone 2/22	Ex d	
To find our preferred parts, go to: www.pepperl-fuchs.us/encoder				

AS-Interface

Get Your Network Up and Running Quickly and Efficiently with AS-Interface



Highlights:

- Successful, well-established low-level I/O network.
- Modules can be connected from numerous manufacturers with extremely efficient installation methods.
- Easy to install and minimal cable reduces installation costs and time by more than 40%.
- Flexible and efficient, uses network topology, enabling users to install the system in a layout that best fits their application.
- Reliable piercing technology, which is easy and inexpensive to install.
- More room in the enclosure through the omission of traditional cable trees.



I/O Modules

I/O modules form the link between devices (i.e., sensors) and AS-Interface. Modules with different numbers of inputs and outputs are available for enclosures or field applications.



Safety

AS-Interface Safety at Work is the safety solution that enables networking of safety devices (safety door switches, emergency stop pushbuttons, and safety light curtains) on a standard AS-Interface network.



Scanners & Gateways

Gateways and scanners are the information translators between AS-Interface and a higher-level network or PLC.



System Components/Accessories

Pepperl+Fuchs offers all the necessary accessories needed to put your AS-Interface system together. These include flat cable splitters, adapters, AS-Interface cable, and a handheld programmer, etc.



The G10 ultra-compact design fits into every cable duct for easy mounting.



AS-Interface mechanical safety switches share a common mounting footprint, allowing simple replacement of conventional switches.

AS-Interface

Standard I/O Modules	000		Anna Anna Ce	Contraction of the second
	Flat (G12)	Round (G11)	Flat (G10)	Field (G4)
Highlights	 One-piece housing with stainless steel base Installation without tools Metal threaded inserts 	 Circular design enables arbitrary mounting and can be used with any flat cable orientation. Housing with central screw enables fast mounting 	 Ultra-compact module perfect for space-limited applications. Sensors connected using integrated pigtail, which exits the housing parallel to the flat cable 	 User-friendly installation allows custom cable lengths to terminal base Flat or round cable connectivity
Mounting Location	Field	Field	Field	Field
Digital I/O	4-in, 4-in/4-out, 4-in/3-out, 2-in/2-out	4-in, 4-in/4-out	2-in, 1-in/1-out, 2-in/1-out, 2-out	4-in, 4-in/4-out, 4-in/3-out, 2-in/2-out
Analog I/O	N/A	2-in, 4-in, 2-out, 4-out	N/A	2-in, 4-in, 2-out
Input Type	2-, 3-,4-wire sensors (PNP), DC	2-, 3-,4-wire sensors (PNP), DC	2-, 3-,4-wire sensors (PNP), DC	2- or 3-wire sensors (PNP), DC
Output Type	Electronic outputs, PNP	Electronic outputs, PNP	Electronic outputs, PNP	Electronic outputs, PNP
I/O Connection	M12	M12	M12	Cord grip
Protection Class	IP67	IP68, IP69K	IP68, IP69K	IP65, IP67
Approvals		(

To find our preferred parts, go to: www.sensing.net/asi-modules

Accessories



Flat Cable Splitters Connects or splits two pieces of flat cable, 8 A capacity.



Flat to M12 Adapters Connects one or two flat cables to an M12 connector or pigtail. Many lengths and connector styles available.



Handheld Programmers

Handheld programmers are a must for every AS-Interface network. Provides ability to easily program addresses; read inputs and set outputs on most AS-Interface nodes.

A CONTRACTOR OF STREET				
Compact (G16)	Pneumatic	Enclosure (KE, KE5)	Junction Box (KE1, CB1)	Enclosure (KE2)
 Slim, compact design ideally suited for space-limited applications Metal threaded inserts 	 Flat or round cable connectivity Pneumatic outputs with a high air throughput rate for direct control of pneumatic drives in the field 	 Thinnest housing offered Housing with removable, mechanical and color coded terminals 	 Lowest profile housing Ideal for junction boxes and easy connection for pushbuttons and pilot devices 	 Equipped with analog inputs and outputs that can be scaled automatically. Modules can also be connected as combined current/voltage module
Field	Field	Enclosure	Enclosure	Enclosure
4-in, 4-in/4-out	4-in/2-out	4-in, 4-in/4-out, 4-in/3-out	4-in, 4-in/4-out 4-in/2-out	4-in/3-out
N/A	N/A	N/A	N/A	2-in, 2-out
2- or 3-wire sensors (PNP), DC	2- or 3-wire sensors (PNP), DC	3-wire sensors (PNP), DC	2-wire sensors (PNP), DC	4 20 mA, 0 10 V
Electronic outputs, PNP	Pneumatic	Electronic outputs, PNP	Electronic outputs, PNP	4 20 mA, 0 10 V
M8	M12	Relay or electronic oututs, PNP	Removable spring double terminals	Removable terminal
IP68, IP69K	IP65	IP20	IP20	IP20, IP68, IP69K

To find our preferred parts, go to: www.sensing.net/asi-modules



Flat AS-Interface Cable Comes in black or yellow in 100 m box, 500 m spool, or 1000 m spool.



Pushbuttons and Stack Lights

Pepperl+Fuchs offers a variety of command and signaling devices for AS-Interface applications. Pushbutton modules, stack lights, and audible alarms, along with other indication and operation products, support your AS-Interface projects.

AS-Interface

Gateways				
		Gateway with SafetyMonitor and power supply	Gateway with power supply	Gateway
Highlights		 Easy safety diagnostics Gateway and safety monitor in one housing Single or dual AS-Interface networks Integrated decoupling available Safe-Link 	 Ethernet diagnostic port Single or dual AS-Interface networks Upper-level networks supported Integrated decoupling available 	 Networks separated on different power supply Redundant power connections 8 possible per network
	Ethernet	VBG-ENX-K30-*-EV	VBG-ENX-K20-*-EV	VBG-ENX-K20-DMD
	PROFINET	VBG-PN-K30-*-EV	VBG-PN-K20-*-EV	VBG-PN-K20-DMD
Network	PROFIBUS	VBG-PB-K30-*-EV	VBG-PB-K20-*-EV	VBG-PB-K20-DMD
Connectivity DeviceNET Modbus ASCII/RTU				VBG-DN-K20-*
				VBG-MOD-K20-D
	CC-Link			VBG-CCL-K20-D-BV
Integrated We	bserver	1 A A A A A A A A A A A A A A A A A A A		100 A.
Diagnostics (i.e., ControlTo	pols)	Ground fault detection, error counters, duplicate address detection, overvoltage detection	Ground fault detection, error counters, duplicate address detection, overvoltage detection	Ground fault detection, error counters, duplicate address detection, overvoltage detection
Memory Card		1	100 B	100 A.
Graphical Dis	play		100 B	100 B
Standard Inputs		4 EDM or 4 Start inputs		
Safe Inputs		6 (optional)		
Safety Output	S	2 relay, 2 PNP transistor, 6 (optional)		
Approvals				
CAT 4/SIL 3 PI	Le Approved	•		
			, .	

To find our preferred parts, go to: www.sensing.net/asi-gateways

Scanners		
		Scanner
Highlights		 Single or dual AS-Interface networks solutions Available for those who prefer a direct connection via the PLC backplane
	MicroLogix 1500	
PLC	CompactLogix	VEW MEXICIEX
Connectivity	SLC5/03/04/05	SST-ASI-SLC
	ControlLogix	VBM-CLX-DM
Diagnostics (i.e., ControlTo	pols)	Error counters, overvoltage detection
Approvals		

To find our preferred parts, go to: www.sensing.net/asi-scanners

Network Extension		
	Repeaters	Terminator
Highlights	 Field mount or enclosure mount housings Built-in terminator extends the first segment up to 200 m, 300 m total 	 Extends linear network up to 200 m without repeater Low-voltage diagnostic LEDs Two impedance options for different network topologies
Length of First Segment	100 m, up to 200 m	200 m
Length of Second Segment	100 m	
Protection Rating	IP20, IP67	IP68/IP69K
Communication Monitoring	•	
AS-Interface Connection	Flat cable piercing or terminals	Flat cable piercing
To fin	d our preferred p	arts do to:

To find our preferred parts, go to: www.sensing.net/asi-repeaters



Power Supplies

Pepperl+Fuchs offers a variety of power supplies: 30 V with data decoupling and 30 V, 24 V without data decoupling. Power supplies are integral to any AS-Interface network. Every AS-Interface network segment requires a power supply. Power supplies are needed on an AS-Interface network to decouple the power and data transferred on the same cable.

AS-Interface – Safety at Work

Safety Monitors			Safety Switch	
	8-Channel			E-stop
Highlights	 Stand-alone solution, can be part of safety r Ideal with third-party gateways 	network	Highlights	 Illuminated or nonilluminated
Input Type	4 safe inputs or 8 standard inputs		Input Type	2 safety-related inputs Reset by pulling
Output Type	8 standard outputs		Output Type	N/A
Interface type	Micro USB		Connection Type	M12
Safe-Link			Protection Class	IP65
Protection Class	IP20		Approvals	CE CU us ASLA, CAT4, SIL3, Ple
Approvals	CE () us , cat4, sil3,	Ple	To find o	ur preferred parts, go to: sensing.net/asi-estops
To find	our preferred parts, go to:			
VV VV .3	sensing.net/asi-monitors			
Safety I/O Modules			2	
	Flat (G12)	Flat (G10)		Speed Monitor (KE4)
Highlights	 One-piece housing with stainless steel base Installation without tools Metal threaded inserts 	■ Ultra co places ■ Easy, di	ompact size allows it to fit in t irect connection with built-in	ght Slim, complete module for all safety categories Ideal for applications requiring one safety rotary encoder or 2 standard encoders per axis
Mounting Location	Field		Field	Enclosure
Digital I/O	2-safe inputs, 2 standard outputs	2-sa	fe inputs, 2 standard outputs	2-safe inputs
Input Type	2-wire safety dry contacts	2-wire safety dry contacts		2 sine/cosine inputs for incremental rotary encoders
Output Type	Electronic outputs, PNP		Electronic outputs, PNP	N/A
I/O Connection	M12		M12	Removable terminals
Protection Class	IP67		IP68, IP69K	IP20
Approvals		C E .(US ASA , CAT4, SIL	3, Ple
To find our preferred parts, go to: www.sensing.net/asi-safetyio				

Safety Switch	And Barris		ALL
	Mechanical	Coded Magnetic	Enabling Switch
Highlights	 Steel actuator head Highly visible LEDs Power to lock/unlock options 	 Common form factors allow drop-in replacement 	 3-position switch with panic button Rugged rubberized housing Lightweight
Input Type	2 safety-related inputs, 1 door-monitoring contact, 1 magnet-monitoring contact	N/A	2 safety-related inputs
Output Type	N/A	LED	N/A
Connection Type	M12	With fixed cable and M12 connector, 4-pin Read head: M8	M12
Protection Class	IP67	IP67	IP67
Approvals		CE CLU , CAT4, SIL3, Ple	

To find our preferred parts, go to: www.sensing.net/asi-switches

Safety I/O Modules				
	Enclosure (KE1)	Enclosure (KE1)	Enclosure (KE3)	Enclosure (KE4)
Highlights	 Lowest profile housing Ideal for enclosures and easy connectivity 	 Lowest profile housing Ideal for enclosures and easy connectivity 	 Equipped with analog inputs and outputs that can be scaled automatically Modules can also be connected as combined current/voltage module 	 Compact solution providing a large number of safe outputs Safety output module allows safe switching processes to take place remotely in the box
Mounting Location	Enclosure	Enclosure	Enclosure	Enclosure
Digital I/O	2 safe inputs, 2 standard outputs	2 safe inputs, 2 standard outputs	1 safe, redundant output and 4 standard inputs	8 safety-related electronic outputs, each switchable with a standard output, 8 standard inputs
Input Type	2 safe inputs for mechanical contacts such as E-stops	2 safe inputs for connecting non-contact safety devices such as light barriers	2- or 3-wire sensors (PNP), DC	8 standard inputs for EDM
Output Type	Electronic outputs, PNP	Electronic outputs, PNP	Relay output	8 safe electronic outputs 1-8 release circuits
I/O Connection	Removable spring double terminals	Removable spring double terminals	Removable terminals	Removable terminals
Protection Class	IP20	IP20	IP20	IP20
Approvals			, CAT4, SIL3, Ple	

To find our preferred parts, go to: www.sensing.net/asi-safetyio

RFID, Imagers, and Scanners



RFID

At the heart of our RFID technology is our IDENT*Control* System, a full product family that includes:

- Ethernet, DeviceNet, PROFIBUS, CC-Link, EtherCAT or serial interface
- A large selection of read/write heads
- Tags for just about any application & environment
- RFID tags can be read or written to at short or long distances, while in motion, in any orientation, through intervening objects, and without the need for line of sight.



Barcode Imagers

High-resolution, high-density barcode imagers are lightning fast with built-in error correction. The recorded image is evaluated by a powerful DSP or other microprocessor and the resulting information is sent to a number of communication interfaces, e.g., RS232, USB, Ethernet, etc. Codes can be read from any orientation, even if distorted or damaged.

- Handheld & fixed-mount versions
- Decode speeds up to 100 symbols/s
- Reads stationary or moving barcodes

Highlights:

- Handheld and stationary barcode imagers and scanners for detection of linear bar codes or 2-D codes
- High-temperature identification system for a wide range of manufacturing environments and processes with temperatures up to 932 °F / 500 °C
- Radio Frequency Identification (RFID) for sensing, reporting presence and identity, and controlling material flows on conveyor systems



Laser Barcode Scanners

Unlike an imager, laser barcode scanners read and decode the reflected signal simultaneously. The codes are not stored as a static image. Laser scanners read only linear 1-D barcodes. Unlike RFID technology, in order to scan and evaluate barcodes with a laser scanner, line of sight is necessary.



High-Temperature Identification System

Our high-temperature ID system provides a method to track items exposed to temperatures up to 500 °C. Dirt or paint does not affect readability; the contrast is optimized with integrated infrared lighting.

- Simple installation and commissioning
- No complicated adjustment
- Rugged, industrial housing
- Easy commands via Ethernet interface

	Laser Scanner	2-D Imager	High-Temp ID	RFID (HF)	RFID (UHF)
Implementation Cost	Lowest	Low	High	Low	Low
Temperature	500 °F	500 °F	932 °F	428 °F	482 °F
Working Range	24" (600 mm)	12" (300 mm)	18" (450 mm)	6" (150 mm)	200" (5000 mm)
Data Capacity	20 bytes	1.5 kbytes	6 bytes	8 kbytes	8 kbytes
Encryption	No	Yes	No	Yes	Yes
Media Cost	1¢	1¢	\$50	\$1 \$100	10¢ \$13
Read/Write Media	No	No	No	Yes	Yes
Reads/s	10/s	60/s	1/s	50/s	50/s
Passing Speed	6 ft/s	65 ft/s	1 ft/s	20 ft/s	100 ft/s
Ta	find any much				-1

To find our preferred parts, go to: www.pepperl-fuchs.us/rfid

Developments in RFID technology continue to yield larger memory capacities, wider reading ranges, and faster processing; and certainly RFID is gaining popularity with other traditional ID technologies (e.g., barcode). Each technology has advantages that are best suited to the application at hand. We can look at the relative importance and costs of several factors in choosing among the technologies.

RFID



Highlights:

- High-performance RFID components from small tags to intelligent control interfaces
- Compatible with all control platforms worldwide
- Safe and transparent processes customizable at any time
- Global service for your satisfaction

IDENTControl

Read Heads and Tags

Pepperl+Fuchs read heads and tags are divided into three series. Each series has specific advantages. Series Q should be considered first because of the speed and low tag price.

Series P should be considered next because of the embeddable tags and large read head selection. Series U should be considered anytime long range or RFID labels are required.



Series Q, 13.56 MHz High Frequency (HF)

- Standard support for ISO 15693, ISO 14443A tags
- High read/write speeds allow fast 20 ft/s conveyors
- Two read heads operating simultaneously can be as close as 80 mm without interference
- Low read/write tag prices, peel-and-stick RFID tag options
- 2000 byte FRAM tags allow unlimited read and write access
- High temperature read/write tag option to 240 °C



Series P, 125 kHz Low Frequency (LF)

- The widest selection of heads available with 9 models to choose from
- Tags embeddable in metal up to 30 mm diameter
- Smaller spacers allow good read range even when tags are mounted on metal
- 500 mm-long read head is great for use in material handling systems



Series U, 900 MHz Ultra-High Frequency (UHF)

- Read range up to 6 m
- Reads up to 200 tags at the same time
- Low-cost, high-temperature tags for industrial environments

IDENTControl

IDENT*Control* is a full product family that includes (1) IDENT*Control* interfaces, (2) a large selection of read/write heads, and (3) tags for just about any application and environment.

Interfaces

Every read head available from PepperI+Fuchs connects to these controllers. One-, two-, and four-head interface options are available along with many network connectivity options. See the list of features below to help choose the right interface model. All interfaces are programmed the same, regardless of the number of heads or interface housing style.



	1- and 2-Head	4-Head
Read Heads Supported	1 or 2	4
Configuration Options	Rotary switches	Graphical display and keypad
Ethernet	IC-KP2-*HB17-2V1D	IC-KP-B17-A1DA1
EtherNet/IP	•	
PROFINET	•	1 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1
Modbus/TCP	• • • • • • • •	1 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1
TCP/IP, SMTP, HTTP	•	1 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1
EtherCAT	IC-KP2-2HB21-2V1D	
PROFIBUS	IC-KP2-*HB6*	IC-KP-B6-SUBD
DeviceNet		IC-KP-B7-V95
Serial	IC-KP2-*HRX-2V1	IC-KP-R2-V1
CC-Link	IC-KP2-2HB18-2V1	
Protection Class	IP67	IP67

To find our preferred parts, go to: www.pepperl-fuchs.us/rfid



Handheld Programmers

Handhelds are perfect as an accessory to an existing system or as a stand-alone tool to read and write tags.

Features include:

- Color touch screen
- Keypad for entry of alphanumeric characters
- WiFi enabled
- Application-specific programming available

Read Heads

For best performance, the read head choice should be similar in size to the tag chosen. Very little extra range is gained by using a very large head and a small tag. An 18 mm head and 20 mm tag is an excellent choice, but an 80 mm square flat pack reader and a 12 mm diameter tag is a bad choice.



	O'	Coort-1			
	Ring	Large Plate Reader	F190	F192	
Housing Material	PA 6.6	PBT, SS	PBT/AL	PBT, AL	
IDENTControl				100 A.	
13.56 MHz (HF)	IQH1-F198-V1	IQH1-F15-V1			
125 KHz (LF)		IPH-F15-V1			
900 MHz (UHF)			IUH-F190*	IUH-F192*	
To find our preferred parts, go to: www.pepperl-fuchs.us/rfid					

IDENTControl

Tags

Surface Mount

These tags are designed to mount on any nonmetallic material. They can also be mounted on metal if a spacer with an appropriate thickness is used. All tags have a read-only, fixed code that can be used for unique identification. Most also have read/write memory and those sizes are listed in the tables below. All read ranges below are maximum values achieved with the largest read head possible.

			CE		•		$\overline{\mathbf{O}}$
Tag Style	12 mm	16 mm	20 mm	22 mm	26 mm	27 mm	30 mm
Read Range	18 mm	40 mm	60 mm	75 mm	60 mm	95 mm	105 mm
Temperature	266°F (130°C)	302°F (150°C)	185°F (85°C)	248°F (120°C)	320 °F (160 °C)	302 °F (150 °C)	212 °F (100 °C)
R/W Memory (Bits)		1 k, 16 k	1 k	0.25 k, 2 k		8 k	1 k, 16 k, 64k
13.56 MHz (HF)		IQC21-16*	IQC33-20*	IQC*-22*-T9*		IQC24-27*	IQC*-30*
125 kHz (LF)	IPC02-12*	IPC02-16*	IPC02-20*		IPC02-26*		IPC*-30

To find our preferred parts, go to: www.pepperl-fuchs.us/rfid

	EDDIT-1 IQ C91-50P Post fair 127645 CE	•		International Transformer			
Tag Style	50 mm	50 mm (2 Holes)	50 mm Square	Access Card	Label	Hanger	Flex-Tie
Read Range	150 mm	F190: 2 m F192: 5 m	150 mm	160 mm	F190: 2080 mm F192: 5200 mm	F190: 2080 mm F192: 5200 mm	F190: 600 mm F192: 3600 mm
Temperature	194 °F (90 °C)	212 °F (100 °C)	464 °F (240 °C)	158 °F (70 °C)	203 °F (95 °C)	428 °F (220 °C) for 30 min	158 °F (70 °C)
R/W Memory (Bits)	1 k, 16 k	0.5 k	1 k, 8 k	0.25 k, 1 k, 2 k, 8 k	0.5 k	0.5 k	64 bits
13.56 MHz (HF)	IQC*-50		IQC*-50F	IQC*-C1			
125 kHz (LF)	IPC*-50*			IPC*-C1			
900 MHz (UHF)		IUC76-50*			IUC77-25L*	IUC76-C8*	IUC76-83L25- GBL
To find our preferred parts, go to: www.pepperl-fuchs.us/rfid							

Surface Mount on Metal

These tags are for mounting on metal surfaces including steel, and aluminum. All tags have a read-only, fixed code that

can be used for unique identification. Most also have read/write memory and those sizes are listed in the tables below.

		•			All S		
Tag Style	Conveyor	58 mm	Label	F203	F151	F152	F157
Read Range	56 mm	95 mm	FP: 48 mm F190: 460 mm F192: 2700 mm	F190: 720 mm F192: 1800 mm	F190: 720 mm F192: 1800 mm	F190: 720 mm F192: 1800 mm	F190: 2080 mm F192: 5200 mm
Temperature	185 °F (85 °C)	248 °F (120 °C)	185 °F (85 °C)	185 °F (85 °C)	185 °F (85 °C)	185 °F (85 °C)	482 °F (250 °C)
R/W Memory (Bits)	1 k, 2 k	1 k	0.5 k	0.5 k	0.5 k	0.5 k	0.5 k
13.56 MHz (HF)	IQC*CT	IQC21-58					
125 kHz (LF)	IPC03-20CT	IPC03-58					
900 MHz (UHF)			IUC76-28L90- M-FR2	IUC76-F203*	IUC77-F151*	IUC76-F152*	IUC76-F157*
To find our preferred parts, go to: www.pepperl-fuchs.us/rfid							

Embeddable

These tags can be flush mounted in any material but were specifically designed to mount in metal. All tags have a read-only, fixed code that can be used for unique identification. Most also have read/write memory and those sizes are listed in the tables below.

	٢		THE SECOND			E toor - I	
Tag Style	8 mm	10 mm	12 mm	15 mm	16 mm	24 mm	39 mm
Read Range	7 mm	9 mm	12 mm	15 mm	15 mm	24 mm	45 mm
Temperature	185°F (85°C)	185°F (85°C)	185°F (85°C)	185 °F (85 °C)	185°F (85°C)	185 °F (85 °C)	302 °F (150 °C)
R/W Memory (Bits)	1 k	1k, 16 k	1 k	1k, 8 k	1 k	1 k	1 k
13.56 MHz (HF)	IQC21-8	IQC*-10	IQC21-12.4	IQC24-15*			IQC21-39
125 kHz (LF)	IPC03-8	IPC03-10	IPC03-12.4	FPC03-15	IPC03-16GK	IPC03-24	
To find our preferred parts, go to: www.pepperl-fuchs.us/rfid							

Barcode Solutions





Connector Box for Barcode Readers

The CBX can be used with any VB14N reader. It facilitates easy wiring of I/O, power, and upper-level bus systems to the reader. Up to 32 scanners can be connected using the ID-Net protocol.

Barcode Imagers		Ø	Ţ	Ý	seg?	Y
	OPC120P	OPC120W	OHV1000	OHV100	OHV200	ОНV300
Highlights	 Polarization filter for highly reflective surfaces Rotary encoder input to read long barcodes Code quality index output Logo comparison PROFINET 	 Rotary encoder input to read long barcodes Code quality index output Logo comparison RS232 or Ethernet TCP/IP 	 Reads peened and laser etched DPM codes Dual optics can read both DPM and large 1-D barcodes 	 All common 1-D and 2-D codes Durable housing and secured cable ensure drop-shock surviveability Low-priced, wired-only version 	 All common 1-D and 2-D codes 3 readings /s, omnidirectional Wireless Bluetooth of USB interface 	 All comon 1-D and 2-D codes Bluetooth connection Batch mode for collecting data on handheld Audible, tactile, and visual user feedback
	Fixed mount imagers	Fixed mount imagers	Handheld	Handheld imagers	Handheld imagers	Handheld imagers
1-D Barcode Symbologies*	Code 39, Code 128, Int 2 of 5, EAN13, Pharmacode	Code 39, Code 128, Int 2 of 5, EAN13, Pharmacode	Codabar, Code 35 NEC 2 of 5, Posta	9, 128, Int. 2 of 5, Matrix I Symbologies (4CB, Pos Intelligent Mail), UCC	2 of 5, Micro QR, MSI Pl stnet, Planet, Australian, C RSS, UPC/EAN/JAN	essy, Pharmacode, Royal, Japan, KIX,
2-D Barcode Symbologies*	Data Matrix	Data Matrix	Aztec, Codab Micro	olock F, Composite, Data o PDF417, MSI Plessy, PI	a Matrix (ECC200), GoCo DF417, QR Code, RSS St	de, Maxicode, acked
Field Size	65 mm x 105 mm	65 mm x 100 mm	200 mm	200 mm	200 mm	200 mm
Decoding Speed	100 symbols /s	30 symbols /s	3 symbols /s	3 symbols /s	3 symbols /s	3 symbols /s
Maximum Symbol Speed w/Trigger	10 m /s	6 m /s				

To find our preferred parts, go to: www.pepperl-fuchs.us/barcode

 * We are continually expanding solutions. Please consult the factory for symbologies not listed.

	Laser Barcode Readers		
VB14N-300 VB14N-600		VB14N-300	VB14N-600
Highlights Medium-range scanning Code reconstruction Optional oscillating mirror Long-range scanning Code reconstruction Optional oscillating mirror Optional oscillating mirror Medium-range scanning Long-range scanning Code reconstruction Optional oscillating mirror Optional oscillating mirror Optional oscillating mirror Medium-range scanning Long-range scanning Code reconstruction Optional oscillating mirror Optional oscillating mirror Medium-range scanning Long-range scanning Long-range scanning Long-range scanning Code reconstruction Code reconstruction Optional oscillating mirror Optional oscillating mirror Medium-range scanning Long-range scanning Code reconstruction Code reconstruction Optional oscillating mirror Optional oscillating mirror Optional oscillating mirror Distribution Distribution Distribution Distribution Distribution Distribution Distribution Distribution Medium-range scanning Distribution Distrution Distrution	Highlights	 Medium-range scanning Code reconstruction Optional oscillating mirror 	 Long-range scanning Code reconstruction Optional oscillating mirror
Reading Range 50 300 mm 200 600 mm	Reading Range	50 300 mm	200 600 mm
Scan Rate 500 800 /s 0 1000 /s	Scan Rate	500 800 /s	0 1000 /s
Raster (-R versions) 18 mm @ 300 mm 24 mm @ 500 mm	Raster (-R versions)	18 mm @ 300 mm	24 mm @ 500 mm
Symbologies2/5 family, Code 39, Code 93, Code 128, EAN/UPC, Codabar, EAN 128, PharmacodeCode 2/5, Code 39, Code 93, Code 128, EAN/UPC, EAN 128, Codabar, Pharmacode, ISBN128	Symbologies	2/5 family, Code 39, Code 93, Code 128, EAN/UPC, Codabar, EAN 128, Pharmacode	Code 2/5, Code 39, Code 93, Code 128, EAN/UPC, EAN 128, Codabar, Pharmacode, ISBN128

To find our preferred parts, go to: www.pepperl-fuchs.us/barcode



OIT Series High-Temperature Imagers



Pepperl+Fuchs offers robust industrial ID systems for a range of manufacturing environments and processes that are suitable for temperatures up to 500 °C and high mechanical loads. The code carriers use no memory chips, paper, or plastic tags. They consist of a metal plate with a matrix of drilled holes encoded with the tag information (up to 999,999 different 6-digit codes). OITControl, software for the OIT reader, provides a clearly arranged user interface for convenient OIT operation. Using an XML configuration file, OITControl adapts to your plant requirements.



Specifications:

Reading Range	200 450 mm
Interface	RJ45 connector for Ethernet TCP/IP network connection. Connection to EtherNet/IP, Modbus/TCP, or PROFINET is available as a option.
Dimensions	260 mm x 170 mm x 90 mm
Lighting	Internal or external for extended range models
Viewport	Field-replaceable, scratch-resistant, high-temperature mineral glass

Industrial Vision Sensors



Highlights:

Pepperl+Fuchs has a long history in the field of vision sensor technologies. Simple sensors for rack fine positioning to complex sheet verification sensors are just some of the many products available. VMT, a subsidiary of Pepperl+Fuchs, also deals with complex automotive vision systems. Complete system packages include applications for 2-D and 3-D robot visual guidance, inspection of electronic assemblies, loading and unloading systems, and "best-fit" online robot position control.


Sheet Verification Sensor

Pepperl+Fuchs BIS510P sensor is designed for the specific task of verifying the page order of printed media. Pages of a book are put together using a collating or gathering machine. This is a labor-intensive process because each section of the book is manually loaded into the machine. It would be easy for the operator to mix up sections, flip sections over, or accidentally forget to remove the blank section divider page from the stack.

- Automatic Teach-in of reference image
- Can be completely operated without network connection
- Direct connection of trigger sensor for sheet detection
- Encoder input for automatic trigger locating
- Ethernet communication for fast image and data communication
- Free configuration software





Rack Fine Positioning Sensor for ASRS

Unlike traditional retroreflective solutions requiring reflectors mounted in precise locations, the PHA series vision sensor detects reference points directly. The elimination of reflectors and mounting accessories saves time and money in installation, adjustment, and maintenance. Multiple items located on one shelf are no problem for the PHA series. Vision sensors use drilled holes in the shelf crossbar as the reference coordinates.

- Detects the position of an index hole
- Large capture range
- Large detection range
- Integrated contrast compensation
- Compact design
- Integrated illumination



Industrial Vision Sensors

BIS510P Vision Sensor

Image and code matching in one vision sensor

The BIS510P vision sensor verifies the correctness of sheets in collating, folding, and binding machines. It combines the benefits of vision systems and sensors. It is an independent vision sensor that contains a high-resolution camera and a control interface. There is no need for a separate control system, making mechanical integration easier.

It monitors the sheet sequence on the basis of the print image. The first sheet is automatically "taught-in" and then compared with subsequent sheets. The sensor can implement sheet verification at maximum speeds of up to 4 m /s and 10 sheets /s and is well equipped to interface with future post-print machines.

- Image and code matching in one sensor reduces installation requirements
- Reads barcodes vertically and horizontally, data matrix codes omnidirectionally
- Optimal illumination ensures reliable detection even on reflective surfaces
- High reading speed up to 4 m /s with a maximum of 10 sheets /s



	BIS510P	
Field of View	65 mm x 40 mm	Image comparison
Operating Distance	55 mm	
Tolerance Area	> ±10 mm (X,Y) > ±5 mm (Z) 5° torsion	
Surface Curvature	Radius > 100 mm	
Sheet Speed	< 4 m /s	
Response Time	< 100 ms	Barcode reading
Resolution	0.1 mm/pixel	-
Code Symbologies	2/5 interleaved, Code39, EAN128, EAN13, Data Matrix (optional)	
Sensor Type	752 x 480 monochrome	
Illumination	Flashing white light LEDs	
Electrical Connectors	8-pin, M12x1, standard (supply+IO) 5-pin, M12x1, standard (IO) 4-pin, M12x1, standard (LAN)	Data Matrix readin
Protection Class	IP65, dust resistant	the second
Ambient Temperature	-0°C 45°C	
Storage Temperature	-20 °C 60 °C	

To find our preferred parts, go to: www.pepperl-fuchs.us/vision





ing



Rack Fine Positioning System

The PHA rack fine positioning system has been developed for the positioning of high-bay racking equipment. It detects circular holes in the racking structure and their position deviation from the nominal position. The sensor operates in two dimensions and outputs deviation from nominal in the horizontal and vertical directions with sub-mm resolution. An automatic light-exposure regulator is integrated into the sensor to compensate for the different reflection characteristics of the racking profiles. The nominal position

Out of the box, the PHA series is calibrated to work in your ASRS without further calibration. However, if you need to make changes, there is an easy-to-use, Windows[®]-based user interface for customizing calibration, applications, and visualization. Windows[®] is a registered trademark of Microsoft Corporation.



If multiple items are located on one shelf, it is not possible to use the edge of the shelf as the reference for the home position. To solve this problem, the FFPL vision sensors use drilled holes in the shelf crossbar as the reference coordinates.

lies in the center of the capture area as the unit is calibrated

required if the unit is mounted at faceplate working distance.

The position is output via an RS232 or Ethernet interface,

output with polarity annotation to denote right or left of

provides four digital outputs -X, +X, -Y, and +Y. A square

tolerance range is specified around the nominal position.

which may be connected directly to a PLC. The values are

centerline. In addition to the serial Ethernet output, the sensor

and shipped from the factory. No additional calibration is

	PHA*-F200
Object Distance	150 mm 300 mm
Object Size	Hole diameter 10 15 mm (10 15 % of the capture range)
Illuminaton	Integrated IR
Capture Range Max	0 mm x 120 mm
Operating Display	LED green: Ready for operation
Function Display	4 x LED red: +X, -X, +Y, -Y
Interface Type	RS232 and Ethernet
Weight	350 g

To find our preferred parts, go to: www.pepperl-fuchs.us/vision

Machine Safety Sensors and Controls

Highlights:

- Light curtains and grids can be used as area guards, perimeter guards, and machine (point of operation) guards.
- SafeBox system enables the connection of all components of a protection system to a single control unit.
- Single-beam photoelectric safety sensors are available in a rugged, compact housing to fit most applications.
- Ergonomic safety palm button and two hand controls – guarantee operator exclusive machine actuation when connected according to NFPA and ANSI standards.
- Safety bump edges protect closing edges and pinch points.



SLC14/SLC30 Light Curtains – Finger and Hand Detection

These self-contained systems feature cost-effective, point-of-operation safeguarding. Integral redundant and monitored electronic OSSDs easily connect to existing machine safety controls, or use the SafeBox Controller to provide muting functions and integration with other machine safety devices.

SLC-2, -3, -4 Beam Light Grids

Entry/exit safeguarding is easily accomplished with SLC light grids. Classified Type 4 according to IEC 61496-1 and -2, they are suitable for performance level (PLe) applications per ISO 13849-1. They can be used as a self-contained 2-piece system, or with the SafeBox Controller for applications requiring muting or integration with other safety devices.



SLP Series – 3-Piece Safety Light Grids

SLP series safety light grids are perfect for applications requiring a cost-effective, three-piece solution for long-range or perimeter detection. Versions include an integrated transmitter/receiver lightbar partnered with a passive mirror, to 2-, 3-, or 4-beam configurations. SLP Safety Light Grids are used together with the SafeBox Controller to form a Type 4 (according to IEC 61496-1, -2), suitable for performance level (PLe) applications per ISO 13849-1.



SLA Series – Single-Beam Safety Sensors

Versions with compact, die-cast housings can fit into tight spaces. Other long-range versions can easily be used to safeguard along conveyors and around larger machinery. Used with the SafeBox Controller, all are approved to Type 4 (according to IEC 61496-1, -2) and suitable for performance level (PLe) applications per ISO 13849-1.



SafeBox – Modular Safety Controller

The SafeBox Modular Safety Controller enables all components of a machine protection system to connect to a single control unit. With its modular design, it configures easily to fit a wide variety of applications. SafeBox is great for integration of photoelectric safety sensors, mechanical safety systems, and safety switches to meet the requirements of performance level (PLe) applications per ISO 13849-1. It also can provide emergency stop functions for connected e-stop sensors and switches, and a range of muting capabilities for SLC, SLP, or SLA light barriers. The system meets the requirements of both IEC 61496-1 and EN 61508 (SIL3).



SLCS/SLCT Safety Light Curtains

Available in Type 4 or Type 2 versions (per IEC 61496), the SLCS and SLCT series safety light curtains feature completely integrated control electronics and solid-state OSSDs – no separate control module is needed. With a maximum range of 8 m, SLCS and SLCT safety light curtains are available in 14, 30, 60, and 90 mm resolutions.



PSE4 Series – Safety Bump Edges

PSE4 incorporates a thru-beam photoelectric sensor on either end of a pressure-sensitive rubber strip mounted in an aluminium profile that is connected to a safety controller. The system monitors deformation of the rubber profile, such as when an object presses against the strip, to safely monitor pinch points or closing edges on doors or machines. The system is classified Type 4 (according to IEC 61496-1, -2) and suitable for performance level (PLe) applications per ISO 13849-1.

Machine Safety Sensors and Controls

	SLCS/SLCT Series Light Curtains	SLC Series Light Curtains	SLC-2, -3, -4 Light Grids	
Highlights	 Ultraslim profile (only 20 x 30 mm) for unsurpassed mounting flexibility 14 mm (finger detection), 30 mm (hand detection), 60 mm, or 90 mm resolutions Innovative mounting accessories Selectable startup/reset interlock, beam coding, external relay monitor 	 14 mm resolution for finger detection or 30 mm resolution for hand detection in point-of-operation safeguarding applications Lightbar diagnostics for prefault indication, status/fault codes Selectable startup/restart interlock Beam coding prevents crosstalk 	 2-, 3-, 4-beams for body detection in entry and perimeter access applications Lightbar diagnostics for prefault indication, status/fault codes Selectable startup/restart interlock Beam coding prevents cross-talk 	
Operating Range	SLCT: 0.2 8 m, SLCS: 0.4 8 m	SLC14: 0.2 5 m, SLC30: 0.2 15 m	0.2 20 m	
Protected Height	14 mm: 100 1200 mm 30 mm: 100 2400 mm 60, 90 mm: 300 2400 mm	150 1800 mm	500, 800, 900 mm	
Approvals and Certifications	TÜV, cULus, CE	TÜV, cULus, CE	TÜV, cULus, CE	
Safety Type according to IEC 61496	SLCT: Type 2, SLCS: Type 4	Type 4	Type 4	
Emitter Element	Modulated infrared LED	Modulated infrared LED (880 nm)	Modulated infrared LED (880 nm)	
Aperture Angle	± 2.5°, per IEC61496	± 2.5°, per IEC61496	± 2.5°, per IEC61496	
Enclosure Protection Class	IP65	IP67	IP67	
Enclosure Type	SLCT: Aluminum extrusion, silver anodized SLCS: Aluminum extrusion, gold anodized	Aluminum extrusion, RAL1021 (yellow) coated	Aluminum extrusion, RAL1021 (yellow) coated	
Optical Face	Clear polycarbonate	Plastic; optional protective glass available	Plastic; optional protective glass available	
Outputs	2 independent 24 VDC PNP semiconductor monitored channels	2 independent 24 VDC PNP monitored channels, 500 mA; 1 PNP each for start monitor and OSSD status, 100 mA	2 independent 24 VDC PNP monitored channels, 500 mA; 1 PNP each for start monitor and OSSD status, 100 mA	
Connection Type	Standard micro connectors, Receiver: 8-pole, Transmitter: 4-pole	Standard micro connectors, Receiver: 8-pole, Transmitter: 4-pole	Standard micro connectors, Receiver: 8-pole, Transmitter: 4-pole	
Optional Features	Quick-release clamp bracket Top-to-top mounting bracket	Cascade (master/slave) Relay monitor (EDM) Muting (via SafeBox controller)	Relay monitor (EDM) muting (via SafeBox controller)	

To find our preferred parts, go to: www.pepperl-fuchs.us/machinesafety



SafeBox Safety Controller

The SafeBox Safety controller's DIN rail-mounted housing is available in sizes that accommodate two to eight modules, providing application flexibility for a total of up to 32 safety input devices or channels.

SafeBox module types include:

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

SLP Series Light Grids	SLA12 Series Sensors	SLA29 Series Sensors	PSE4 Safety Bump Edges
 2-, 3-, 4-beams for body detection in entry and perimeter access applications Long range (to 65 m) for workcell perimeters & along conveyors Uses SafeBox controller to form a complete safety system 	 Rugged die-cast metal housing Compact size fits in tight spaces Alignment aids and "signal reserve" indication on receiver Rotatable connector or fixed cable for mounting flexibility Uses SafeBox controller to form a complete safety system Long range (to 65 m) for workcell perimeters & along conveyors Visible red light for simple installation and alignment Alignment aid and "signal reserve" indication on receiver Uses SafeBox controller to form a complete safety system 		 Fully encapsulated sensors guard against liquid and dust ingress Ideal for mounting along door or gate edges Suitable for finger protection
0.2 65 m	0.2 10 m	0.2 65 m	
500, 800, 900 mm			up to 10 m
TÜV, cULus, CE	TÜV, cULus, CE	TÜV, cULus, CE	TÜV, cUL⊍s, CE
Type 4 (with SafeBox controller)	Type 4 (with SafeBox controller)	Type 4 (with SafeBox controller)	Туре 4
Modulated visible red LED (665 nm)	Modulated visible red LED (660 nm)	Modulated visible red LED (660 nm)	Modulated infrared LED
± 2.5°, per IEC61496	± 2.5°, per IEC61496	± 2.5°, per IEC61496	
IP65	IP67	IP67	IP68
Aluminum extrusion, RAL1021 (yellow) coated	Frame: zinc, pressure die-cast Sides: plastic	ABS plastic, RLA1021 (yellow)	Strip: rubber Profile: aluminium
Plastic; optional protective glass available	Plastic	Plastic	
2 normally-open force-guided contacts, 10 mA to 6 A load current (via SafeBox controller)	2 normally-open force-guided contacts, 10 mA to 6 A load current (via SafeBox controller)	2 normally-open force-guided contacts, 10 mA to 6 A load current (via SafeBox controller)	2 normally-open force-guided contacts to 6 A load current
Internal wiring chamber/terminal strip	Micro connector, rotatable by 90°, or 2.5 cm fixed cable	Micro connector or terminal compartment	Terminal strip
Startup/restart interlock Diagnostic display muting (all via SafeBox controller)	Startup/restart interlock Diagnostic display muting (all via SafeBox controller)	Startup/restart interlock Diagnostic display muting (all via SafeBox controller)	

To find our preferred parts, go to: www.pepperl-fuchs.us/machinesafety

With its modular flexibility, SafeBox can be configured for a range of applications, including:

Muting controller for SLA single beams	SB4-OR-4CP-4M
Muting controller for SLC safety light curtains	SB4-OR-4XP-4M
4-channel safety controller	SB4-OR-4CP
4-channel safety controller with two e-stop inputs	SB4-OR-4CP-2E
8-channel safety controller	SB4-OR-4CP-4C

Typical Applications:

- Point-of-operation safeguarding on load/unload stations for assembly machines, metalforming equipment, and automotive body welding fixtures
- Perimeter and access safeguarding for robotic assembly workcells
- Access protection around conveyors and material handling equipment



IO-Link Benefits

- Continuous communication at the sensor level
- New possibilities for configuration, control, and diagnostics
- Harnessing data to optimize processes

Sensorik4.0[®]: Paving the Way for Industry 4.0

Industry 4.0 envisions the networking of all components, machines, and systems to minimize information gaps, optimize processes, and save resources. This vision needs new technologies that enable intelligent communication and control. For Pepperl+Fuchs, this is Sensorik4.0[®]: our next generation of innovative sensor solutions that make Industry 4.0 a reality.

IO-Link

IO-Link is a simple, flexible, and secure open communication technology that enables continuous communication at the sensor level. By offering diagnostics down to the last meter of automation, it opens up configuration, control, and diagnostic capabilities of sensors while minimizing the cost of project implementation and downtime. And it uses already existing sensor connections—which means that communication to the control system is possible without additional physical interfaces, housing penetrations, new digital IO-Link cards, or connectors. This increasingly prevalent sensor interface has two main components: the IO-Link master and the sensor. From the outside, IO-Link sensors are indistinguishable from conventional sensors. If IO-Link functionality is not needed, the sensor's default digital or analog connections can still be used as normal. With its simplicity and enormous cost-saving potential, IO-Link is an easy choice for long-term cost reduction and investment security.



Communication Enhances Automation

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is the preferred communication type.

SmartBridge® Technology

Condition-based maintenance, process optimization, and service on demand have become a reality with SmartBridge® technology. SmartBridge takes valuable status data from automation components and makes it directly available to higher-level information systems. It increases the efficiency not just of the individual processes but also your entire production process.



Three Ways to Use SmartBridge®



IO-Link Portfolio

Pepperl+Fuchs offers a range of IO-Link sensors. These devices add tremendous configuration and diagnostic capabilities compared to conventional sensors. Our selection of IO-Link devices includes photoelectric, ultrasonic, and inductive technologies.

For more information about our IO-Link products, visit **www.pepperl-fuchs.us/IO-Link.**



Photoelectric Technology

- DK12 contrast sensor
- R10x series
- MLV41 series
- Series 31
- VDM28
- Automation light grids



Inductive Technology

- PMI inductive position measuring systems
- Multiple product series in F112 and F90 housing styles



Ultrasonic Technology

- Series IO
- Series 77S



Micro DC Cordsets (M12)

- PVC, PUR
- 4-, 5-, & 8-pin
- 0.34 mm² + 0.75 mm²
 (20 + 18 AWG)
- NPN & PNP LED versions
- Shielded cables for analog sensor interface M12, 5-pin, 8-pin

Micro AC Cordsets (1/2"-20)

- PVC & irradiated PUR jacket styles available
- 3-, 4-, & 5-pin versions

DC Cordsets (M8)

- PVC, PUR
- 3- & 4-pin types
- Straight & right-angled versions

Cordset Accessories

- Receptacles M8, M12, 1/2", 7/8"
- Field attachables M8, M12
- Splitter adapters M12

Sensor Junction Blocks

- 4- and 8-port
- M8 and M12 connections
- Consolidates sensor wiring

Mini Cordsets (7/8"-16)

- Compatible with AC & DC sensors
- Yellow PVC cable jackets
- 3-, 4-, & 5-pin versions

Special Cordsets (M12)

- High-temperature POC cable
- Ideal for sensor connection in welding applications

Mobile Equipement

- M12 Cordsets
- Valve connection
- Juction block
- Mobile Equipment connectors
- Outdoor rated



Field-Attachable Connectors

Available as terminal and insulation displacement connectors, these provide the fastest method to add a connector to a cable. No special tools are required. Insulation-displacement and terminal-connection style connectors can terminate a wide range of wire gauges, providing an efficient, tight, and reliable connection.



Junction Blocks

Multiport junction blocks are available in 4-, 6-, or 8-port models and greatly reduce installation times by consolidating all your field wiring into one compact block. They can be ordered in a variety of cable lengths and quick disconnects to suit your application requirements. LED indicators for power and status and an IP67 protection rating are standard on all models.



Receptacles

A wide variety of receptacles is available for virtually every application. Male and female versions with M8, M12, 1/2" and 7/8" connections in 3-, 4-, and 5-pin designs are offered to solve your installation requirements. The machined aluminum housings provide an IP67 protection rating.





M12 and M8 DC Cordsets

A comprehensive range of M12 and M8 DC cordsets are available in PVC and PUR cable materials. Standard lengths range from two to ten meters, and many custom lengths are available.



Welding/High-Temperature Environments

These special cable-jacket-material cordsets are ideal for applications where the cordset is exposed to high-temperature weld slag.



Communication Cables

Communication cables for PROFIBUS and Ethernet connectors complement our line of absolute encoders offering industrial network solutions.



Valve Connectors

Connection cables for valve and solenoid interconnect are available for DIN Type A, B, and C connection types. We offer a complete line that includes models with LED and suppression devices.

The New Generation – Connectors with Impressive Properties

Optimized size and design for a secure grip and connection in the tightest of spaces

- Gold-plated, machined contacts ensure low connection resistance
- Halogen-free PUR cable prevents toxic vapors being released in the event of a fire
- The knurled nut allows the connectors to be securely tighted
- Integrated vibration protection

Basic Cable Connectors Nomenclature

Our standard line of cables and cordsets includes cables that connect to various types of sensors and receptacles. These connection interface styles include industry-standard Micro DC M12 style, DC M8 style, Micro AC 1/2" style, as well as

the Mini AC 7/8" connector types. See below for our standard nomenclature prefix coding for various connection devices. Standard lengths include 2, 5, and 10 meter, as well as many other nonstandard lengths.

Cable/Connections	M12	М8	1/2" connector	7/8" connector
2-wire	V1-G-N			
3-wire	V11	V3	V12	V93
4-wire	V1, V1-G-N4	V31	V124	V94
5-wire	V15		V125	V95
8-wire	V19			

For male connector-ends, an "S" is added after the connector code. V1 = female connector end, V1S = male connector end.

M8 and M12 Style Cables and Cordsets – Colors

Cable	Black	Yellow	Gray	Orange	Blue
PVC	•		•		•
PUR					
POC					
PUR-H/S (irradiated PUR)		■ (½" Micro AC only)			

M8 Cables and Connectors

	\sum	\geq	\sum
	Single-End Sensor Cables	Dual-End Extension Cables	Snap Lock – Female Cables
Туре	M8	M8	M8
Series	V3, V31	V3, V31	V3-GR, V31-GR
Conductors	3, 4	3, 4	3, 4
Cable Type	PVC, PUR, POC	PVC, PUR, POC	PUR
LED Indication	3-pin & 4-pin	3-pin & 4-pin	

M12 Cables and Connectors

Cables are available in many types and styles for connecting proximity sensors to machine control automation systems. Single-end cables are available for direct wiring to the interface device or as extension cables for connection to multiport interface devices such as I/O junction blocks. Our cables are available for the most demanding environments.

	\sum	\geq	\sum
	Single-End Sensor Cables	Dual-End Extension Cables	NAMUR Single-End Cables
Туре	M12	M12	M12
Series	V11, V1, V15, V17, V19	V11, V1, V15, V17, V19	V1-G-N, V1-G-N4
Conductors	3, 4, 5, 7, 8	3, 4, 5, 8	2, 4,
Cable Type	PVC, PUR, POC	PVC, PUR, POC	PUR
Shielded Models	V15 ABG, V19ABG	V15 ABG, V19ABG	
LED Indications	3-pin & 4-pin	3-pin & 4-pin	

To find our preferred parts, go to: www.pepperl-fuchs.us/connectivity

Available with stainless steel coupling nuts.

Micro & Mini AC

	\mathcal{S}		
	Single-End Sensor Cables	Dual-End Extension Cables	Single-End Sensor Cables
Series	1/2" Micro AC	1/2" Micro AC	7/8" Mini AC
Models	V12, V124, V125	V12, V124, V125	V93, V94, V95
Conductors	3, 4, 5	3, 4, 5	3, 4, 5
Cable Type	PVC, PUR-H/S	PVC	PVC
Cable Colors	Yellow	Yellow	Yellow

Field Attachables

Field-attachable connectors are available for many cable styles and many mating connector applications. While many styles use a standard screw terminal connection method, a variety of models offer quick-connect insulation displacement technology, making connection easier and quicker than ever. This allows you to easily customize your cabling by creating applicationspecific cable lengths on site.



To find our preferred parts, go to: www.pepperl-fuchs.us/connectivity

	0			
Series	1/2" Micro AC	7/8" Mini AC	M18	Rd24
Models	V12	V93, V94, V95	V18	V16
Style	Female/Male	Female/Male (Internal/external threading)	Female	Female/Male
Conductors	3	3, 4, 5	4	6+PE
Connection Type	Screw terminal	Screw terminal	Screw terminal	Screw terminal

Panel Receptacles



Series	M12	М8	M12	1/2" Micro AC	7/8" Mini AC	M12 Micro DC
Models	V1, V15, V19	V3, V31	V1, V15, V19	V12, V124, V125	V93, V94, V95	V1, V15
Style	Female/Male	Female/Male	Female/Male Dual-sided version available	Female/Male	Female/Male	Female/Male
Pin Count	4, 5, 8	3, 4	4, 5, 8	3, 4, 5	3, 4, 5	4, 5
Mounting	Front panel	Front panel	Front/Back panel	Front panel	Front panel	Front panel
Mounting Thread	1/2" NPT	M8	M16 or PG9	1/2" NPT	1/2" NPT	1/2" NPT

To find our preferred parts, go to: www.pepperl-fuchs.us/connectivity

Available with PG9 and M16 mounting thread.

Junction Blocks and Wireless Inductive System (WIS)

Sensor I/O junction blocks offer many advantages in consolidating the sensor wiring point connections to a central collection block. This makes cable routing for modular machine design more organized and allows convenient wiring verification and troubleshooting. Each I/O port block includes LED indication that can be used to verify sensor functionality and indicate machine operation status. The Wireless Inductive System (WIS) allows noncontact, short distance wireless coupling of power and signal for up to eight sensors. Available with both 30 mm and FP (80 x 80) signal coupler/receivers.

Series	M12	M8	Wireless Inductive System (WIS)
Ports/Inputs	4/4, 4/8, 8/8, 8/16	4/4, 6/6, 8/8	8
Connection	PUR cable, terminals, M23	PUR cable, M23, M12	Inductive coupled power/signal
Sensor Input Type	PNP	PNP	PNP

Splitters

Series	T-Splitters	Y-Splitters	Y-Splitters	Y-Splitters
Туре	V1, V15	V1	V3	V1, V3
Connectors	M12	M12 Custom Y-Splitters available	M12, M8	M12, M8

To find our preferred parts, go to: www.pepperl-fuchs.us/connectivity

Specialty Cables

Series	Ethernet	PROFIBUS	DeviceNet/CANopen	
Style	V1SD	V15B	V15-CAN	
Types	M12 to M12	M12 to M12	M12 to M12	
	M12 to RJ45			
	RJ45 to RJ45			
	Field attachables (D-Coded)	Field attachables (B-Coded)	Field attachables (A-Coded)	
To find our preferred parts, go to: www.pepperl-fuchs.us/connectivity				

Valve Connection Cables

Pepperl+Fuchs offers a complete line of valve connection cables and field-attachable valve connectors in standard Type A, B, C, Bl, and Cl models. The cables come preleaded or with an integral M12 style straight or right-angled connector. The valve plug heads are also available with suppression circuits and LEDs as standard feed-through cables to meet your application requirements.



To find our preferred parts, go to: www.pepperl-fuchs.us/connectivity

Automotive

Cables for the automotive industry are exposed to grease, oil, and dirt, as well as welding areas with exposure to hot welding flash and spatter. In these areas, we recommend our weld-immune cable products, specially created for the toughest applications.

Series	M12	M12 / M12	М8	M8 / M12	Y-Splitters
Models	V1	V1 female / V1 male	V3	V3 female / V11 male	V1 male / 2 x V1 female
Conductors	4	4	3	3	4/3
Cable Type	POC	POC	POC	POC	POC
Cable Colors	Orange	Orange	Orange	Orange	Orange

To find our preferred parts, go to: www.pepperl-fuchs.us/connectivity

Model with LED illumination available.

Your automation, our passion.

Explosion Protection

- Intrinsically Safe Barriers
- Signal Conditioners
- Fieldbus Infrastructure
- Remote I/O Systems
- HART Interface Solutions
- Wireless Solutions
- Level Measurement
- Purge and Pressurization Systems
- Industrial Monitors and HMI Solutions
- Electrical Explosion Protection Equipment
- Solutions for Explosion Protection

Industrial Sensors

- Proximity Sensors
- Photoelectric Sensors
- Industrial Vision
- Ultrasonic Sensors
- Rotary Encoders
- Positioning Systems
- Inclination and Acceleration Sensors
- AS-Interface
- Identification Systems
- Logic Control Units
- Connectivity



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