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QUICK SELECT PRODUCT GUIDE

Capacitive Sensors

Inductive Sensors

Photoelectric Sensors

Ultrasonic Sensors

Rotary Encoders

AS-Interface

RFID, Imagers, and Scanners

Industrial Vision Sensors

PosiTrack System

Machine Safety

Cordsets

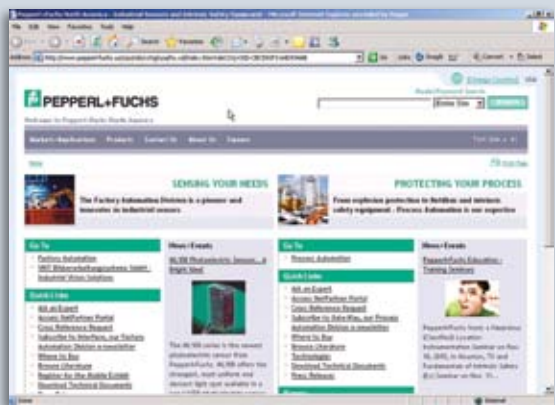
Edition 3.0



Pepperl+Fuchs' Mobile Exhibit Brings the Latest Technology Right to Your Door!

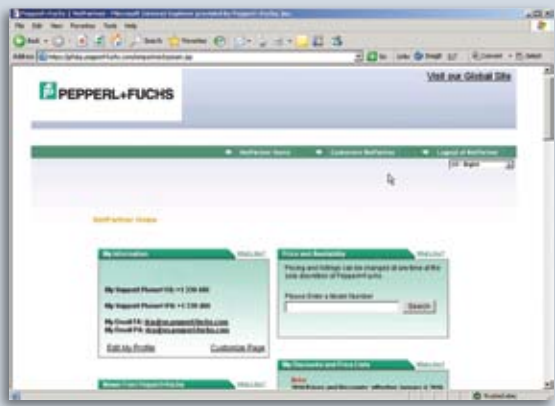


Our mobile exhibit travels throughout the U.S., Canada, and Mexico demonstrating our extensive line of technologies. Inside, you'll find 15 application panels that provide a "hands-on" demonstration of the innovative solutions Pepperl+Fuchs' products can provide for your toughest applications. Staffed by a knowledgeable Pepperl+Fuchs' factory sensor expert, you'll get the answers you're looking for on the latest in sensing technology.



Need Help Solving a Tough Application?

Pepperl+Fuchs wants to ensure you receive the service and support you need when you need it—24 hours a day. You can find CAD drawings, download comprehensive data sheets for all Pepperl+Fuchs' sensors, or request free literature. Visit www.pepperl-fuchs.us.



Need More? Ask an Expert.

With a click of the mouse, you can get advice from engineers who are experts in sensing technology, who are familiar with a wide range of applications, and who can help you solve your most challenging problems. Visit www.sensing.net/ask.



We're Sensing Your Needs

Even though we offer a comprehensive line of sensing products, our standard products may not always be a perfect fit. If that's the case, give one of our application specialists a call at 330-486-0001 to discuss your unique sensing requirements.

You Need Reliable Solutions...We Can Sense That!

QUICK SELECT PRODUCT GUIDE

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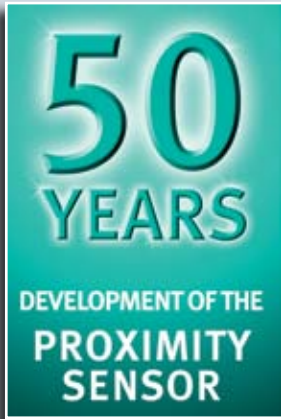
Visit us at www.pepperl-fuchs.us or call us at 330-486-0001



50+ Years of Pioneering Work and Continuous Innovation...

In 1958—over 50 years ago—the proximity sensor was invented in a Mannheim laboratory owned by Pepperl+Fuchs. What was originally conceived as a customer-specific solution for an intrinsically safe application in the chemical industry, has since become the universally recognized industry standard for non-contact switching. That makes the proximity sensor one of the oldest electronic components in automation.

This achievement was possible because we never stopped improving this enabling technology, continually expanding its capabilities. We improved switching distance, IP ratings, electromagnetic shielding, and developed models for use in extreme environmental conditions. Eventually, we integrated an amplifier, power electronics, and even a micro controller directly into the sensor, turning the inductive proximity sensor into a success story that has become an integral part of today’s factory automation.



Expanded Product Lines

We have the largest and most diverse selection of sensing technologies in the world. Exactly what you need for your application, all from a single supplier.

Quality

Our products are produced according to ISO 9001, carry international certifications for worldwide applications, and include a lifetime warranty.

Unparalleled Service

Expert application analysis and technical expertise is standard with every Pepperl+Fuchs’ product... at no extra charge.

Value

We offer the best product at the best price with the best service and support in the world.

Competitive Pricing

You won’t find a product at the same price with the quality, durability, and engineering expertise that comes with Pepperl+Fuchs’ products.

Global Support

We are located in over 80 major cities on six continents. We’re there when you need us, in the field or over the phone.

US-Based Engineering

We understand your applications, and we’re able to discuss and explain solutions. We have thousands of tailored solutions designed and developed right here in the US that will solve your most challenging application requirements.

Worldwide Manufacturing

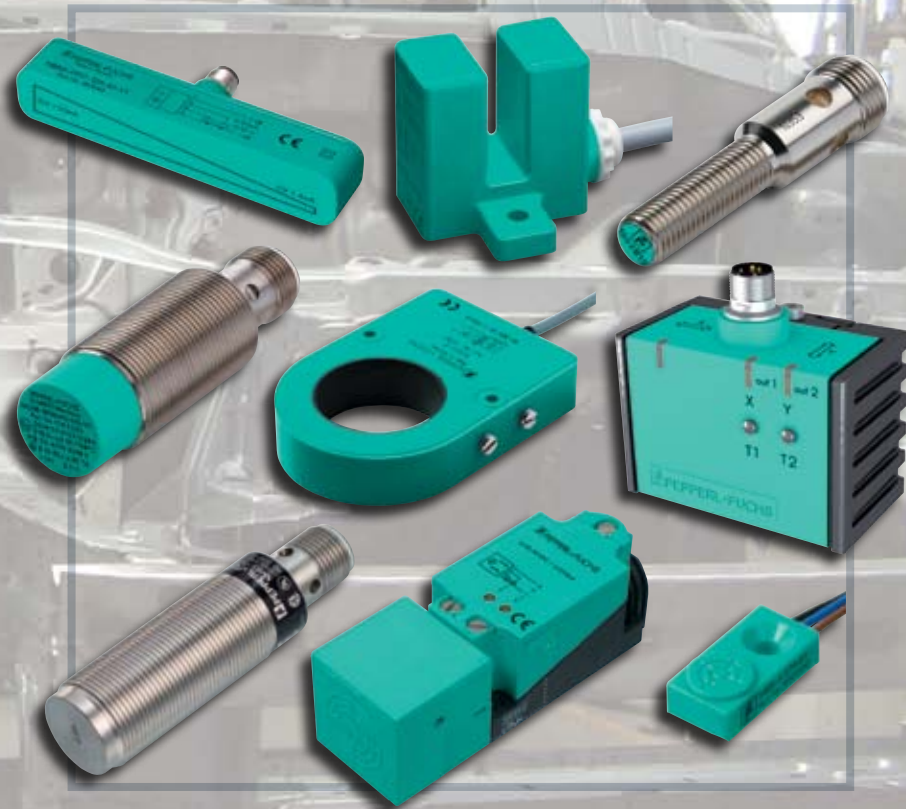
Locations are selected for their expertise and outstanding business practices. They supply high-quality parts precisely manufactured to global standards.

Heritage of Innovation

Our heritage of innovation originated when Pepperl+ Fuchs pioneered the inductive proximity sensor. Since that time, we’ve progressed to become a diversified industrial enterprise and a world leader in sensing technology.

Proximity Sensors

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



Capacitive Sensors

Capacitive sensors are available in cylindrical and surface mount styles with 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.



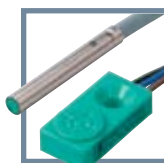
Basic Series

Pepperl+Fuchs Basic Series inductive sensors provide the ultimate combination of accuracy, durability and cost-effectiveness. 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

Pepperl+Fuchs X-Series offers 25-200% more sensing range than traditional inductive sensors. Sensors in this series 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

Pepperl+Fuchs features 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, Pepperl+Fuchs' Reduction Factor 1 series reliably detects 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 slag buildup and welding spatter.



Inclination Sensors

Using the latest technology in IC based electro-mechanical 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 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 an angular measurement, devices are available with a measuring range of 0 to 360°. In addition to standard analog outputs, these devices also offer configurable switch point outputs for limit detection.



Ring and Slot Inductive Sensors

Pepperl+Fuchs offers ring sensors with through-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. Their 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.

Want more information?

Simply go to: www.sensing.net/capacitive • www.sensing.net/inductive

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PEPPERL+FUCHS
SENSING YOUR NEEDS

Capacitive Proximity Sensors

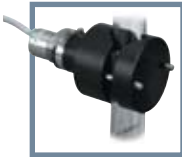
Cylindrical & Surface Mount

								
	12 mm Diameter	18 mm Diameter	30 mm Diameter	F64	50 mm Diameter Ultra Slim	F46 Ultra Slim	Limit Switch	FP
Highlights	<ul style="list-style-type: none">Adjustable sensing rangePlastic or metal housingShielded or unshielded models	<ul style="list-style-type: none">Adjustable sensing rangeShielded versionPlastic or metal housing	<ul style="list-style-type: none">Adjustable sensing rangePlastic or metal housingShielded or unshielded models	<ul style="list-style-type: none">Small housingHigh sensing rangeLED indication	<ul style="list-style-type: none">Adjustable sensing rangeIntegral switches configure NPN/PNP and N.O./N.C.	<ul style="list-style-type: none">Fixed rangeSurface or tie-wrap mountingPlastic housingNPN, PNP models	<ul style="list-style-type: none">Adjustable sensing rangeLimit switch-style housingShielded model	<ul style="list-style-type: none">Adjustable sensing rangeLongest sensing rangeUnshielded
Sensing Range	1-8 mm	1-8 mm	1-20 mm	8, 12, 15 mm	1-30 mm	2, 5, 10 mm	1-15 mm	5-50 mm
Adjustable Sensitivity	■	■	■		■	■	■	■
NAMUR (Intrinsically Safe)	■	■	■			■		■
3-Wire DC (PNP & NPN)	■	■	■	■	■	■		
4-Wire DC (PNP & NPN)			■				■	■
2-Wire AC			■				■	■
Chemically Resistant	■					■		
Electrical Connection	Cabled	Cabled	Cabled, micro	Cabled	Cabled	Cabled	Terminal connection	Terminal connection

Capacitive Sensors

Pepperl+Fuchs' capacitive sensors can be used to detect nonmetallic objects. These include liquids, such as acids, water, and oil; 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 crastin, 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.

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 9.5 mm to 38 mm diameter. The mount makes it easier to adjust the sensor without disturbing the fluid inside the tank.



Mounting Flanges

Mounting flanges keep tanks sealed when the sensor is removed. They are made of a durable Teflon® or Delrin® material and have a 30 mm diameter.











Teflon® and Delrin® are registered trademarks of E.I. du Pont de Nemours & Company.

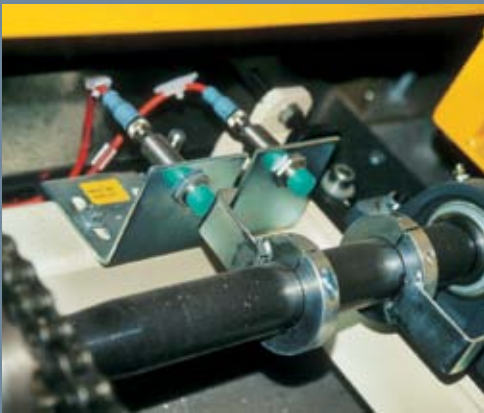


Want more information?
Simply go to: www.sensing.net/capacitive

Inductive Proximity Sensors

Cylindrical

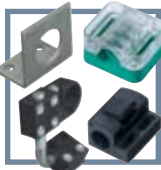
	 3 mm Diameter	 4 mm Diameter	 4.5 mm Diameter	 5 mm Diameter	 6.5 mm Diameter	 8 mm Diameter	 11 mm Diameter	 12 mm Diameter	 18 mm Diameter	 30 mm Diameter
Highlights	<ul style="list-style-type: none">• Smallest size• Smooth barrel• Fast switching• Stainless steel	<ul style="list-style-type: none">• Smooth and threaded barrels• Fast switching• Stainless steel	<ul style="list-style-type: none">• Intrinsically safe• Short housing• Stainless steel	<ul style="list-style-type: none">• NPN, PNP and NAMUR models• Threaded barrel• Short housing	<ul style="list-style-type: none">• NPN, PNP and NAMUR models• Models with LED status• Smooth barrel	<ul style="list-style-type: none">• 4-way LED available• Threaded barrel• Shielded or unshielded models	<ul style="list-style-type: none">• Intrinsically safe• Smooth plastic	<ul style="list-style-type: none">• Wide range of wiring options• Shielded or unshielded models	<ul style="list-style-type: none">• Wide range of wiring options• Shielded or unshielded models	<ul style="list-style-type: none">• Longer sensing range• Shielded or unshielded models• Relay output models
Sensing Range (Shielded)	0.6, 1 mm	0.8, 1 mm	0.8 mm	0.8, 1.5 mm	1.5, 2 mm	1.5, 2, 3, 4 mm	2 mm	2, 3, 4, 6 mm	5, 8, 12 mm	8, 10, 15 mm
Sensing Range (Unshielded)					3 mm	2, 3, 4, 6 mm	5 mm	4, 6, 7, 8, 10 mm	8, 12, 15, 20 mm	15, 20, 25, 30, 40 mm
NAMUR (Intrinsically Safe)			■	■	■	■	■	■	■	■
2-Wire DC						■		■	■	■
3-Wire DC	■	■		■	■	■		■	■	■
4-Wire DC						■		■	■	■
2-Wire AC						■		■	■	■
2-Wire AC/DC								■	■	■
Electrical Connection	Cabled	Cabled	Cabled	Cabled, nano	Cabled, nano, micro	Cabled, nano, micro	Cabled	Cabled, micro	Cabled, micro, mini	Cabled, micro, mini
Half Pint	■	■		■	■	■		■	■	■
AS-Interface Compatible								■	■	■
Reduction Factor 1						■		■	■	■



Typical Applications:

- Robotics
- Conveyors
- Machine tools
- Counting
- Elevators

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.

Want more information?

Simply go to: www.sensing.net/inductive

Inductive Proximity Sensors

Surface Mount

								
	F79	F41	F29	V3	F1	F33	F104M	F17
Highlights	<ul style="list-style-type: none">• Smallest housing• IP67• 16 x 8 x 4.7 mm• 5-30 VDC operation	<ul style="list-style-type: none">• Nickel-plated brass housing• Narrow housing style• 40 x 8 x 8 mm	<ul style="list-style-type: none">• Small, compact housing• Corner LED• 5-30 VDC operation	<ul style="list-style-type: none">• Miniature rectangular housing• LED status	<ul style="list-style-type: none">• Fast switching• LED status• Stackable (shielded) models	<ul style="list-style-type: none">• Flat rectangular plastic housing• NPN and PNP models• Die-cast zinc housing available (F33M)	<ul style="list-style-type: none">• Flat rectangular metal housing• NPN and PNP models• Dual LED indication• Weld immune models available	<ul style="list-style-type: none">• Output status LED• Thin housing• 50 x 30 x 7 mm
Sensing Range (Shielded)	1.5 mm	1.5, 2 mm	2 mm	2, 3 mm	2, 4 mm	5, 7, 8 mm	5, 7 mm	10 mm
Sensing Range (Unshielded)	2 mm		4 mm	4 mm	8 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	Cabled, nano	Cabled	Cabled, nano, FASTON terminal	Cabled, nano	Cabled	Cabled, micro pigtail	Cabled



Typical Applications:

- Actuators
- Positioning
- Packaging machinery
- Jam protection
- Air or hydraulic cylinder positioning

Crastin® is a registered trademark of E.I. du Pont de Nemours & Company.

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 switch isolator/power supply for min/max control. It also provides an output conversion to form C relay contacts.

Want more information?
Simply go to: www.sensing.net/inductive

Inductive Proximity Sensors

Surface Mount
(continued)

	 F7/F10	 RHINO™	 Limit Switch	 Flat Pack	 F23	 Slot Type	 Ring Type
Highlights	<ul style="list-style-type: none">• Mini cube style• Shielded or unshielded models	<ul style="list-style-type: none">• Metal base and bracket• High-visibility LEDs• Quick-release plastic bracket• Weld immune models	<ul style="list-style-type: none">• Limit switch-style housing• Metal or plastic base• DC models (4 LEDs)• 1/2" NPT	<ul style="list-style-type: none">• Flat pack housing• Metal base, 1/2" NPT• Corner edge LED	<ul style="list-style-type: none">• Longest sensing range• IP67• Plastic housing, aluminum base	<ul style="list-style-type: none">• 2-30 mm slot widths• Highly accurate detection• Greater than 1 kHz switching possible with NAMUR	<ul style="list-style-type: none">• 10-100 mm ring diameters• Greater than 1 kHz switching possible with NAMUR
Sensing Range (Shielded)	7 mm	20 mm	20 mm	40, 50, 75 mm			
Sensing Range (Unshielded)	5, 7, 10 mm	40 mm	40 mm	40, 50, 75 mm	100 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	Terminal connection, mini	Micro, mini, terminal connection	Micro, mini	Cabled	Cabled, micro
Half Pint							
AS-Interface Compatible		■	■	■			
Reduction Factor 1		■	■	■			



Typical Applications:

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

Accessories



Unistrut® Bracket

The adjustable Unistrut bracket and mounting track are 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°.

Unistrut® is a registered trademark of the Unistrut Corporation.



Panel Meter











The DA5-IU-2K-V is a multi-function indicator that allows visual display of the connected analog

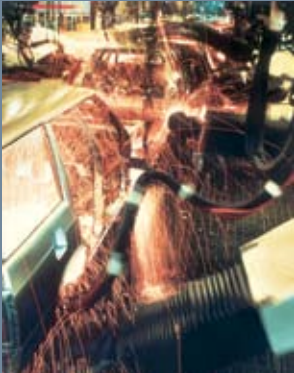
signal. It has 2 programmable relay outputs for level detection, a scalable 5-digit display, and a 24 VDC/100 mA output supply to power the sensor.

Want more information?

Simply go to: www.sensing.net/inductive

Special Sensors
Cylindrical and Surface Mount

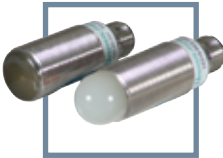
	 PILE DRIVER™	 Cylinder Switch	 Inclination Sensors	 Position Measurement	 Sensors for Mobile Equipment	 Relay Output	 Extended Temperature	 Explosion Proof	 High Pressure	 Magnetic Sensors
Highlights	<ul style="list-style-type: none">• “Wear-proof” 100% stainless steel housing• 8, 12, 18, and 30 mm diameter models• IP69K washdown rating• Extended sensing range	<ul style="list-style-type: none">• End-of-stroke verification in hydraulic and pneumatic• Operational pressure ratings to 3000 psi• Weld field immune• Many standard probe lengths	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• Non-contact detection• Analog output 0-10 V, 4-20 mA• Programmable switch points• 5 to 510 mm linear range• 0 to 360° rotation sensing range	<ul style="list-style-type: none">• -40 °F to +185 °F operational temperature• Extended sensing range• Heavy cable gauge• IP69K rated	<ul style="list-style-type: none">• Switch load currents up to 6 A• Mechanical shock rating of 150 g• Limit switch models	<ul style="list-style-type: none">• Operational temperature ratings from -40 °F to +486 °F• Cylindrical and surface mount housing styles• Remote amplifier models	<ul style="list-style-type: none">• UL approved for use in hazardous areas• Solid-state components• All-metal housings	<ul style="list-style-type: none">• Pressure ratings to 7000 psi• 12 mm diameter models• 3-wire DC and NAMUR• Pile Driver version	<ul style="list-style-type: none">• Capable of detection through aluminum• Cylindrical and surface mount housings
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, mini	Micro, mini	Cabled, micro	Cabled, micro	Cabled, Deutsch 4-pin	Cabled, mini, terminal connection	Cabled, micro, terminal connection	Cabled	Cabled	Cabled, micro
Relay Output						■				
AS-Interface Compatible										



Typical Applications:

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

Accessories



LED 18 mm Indicator Lights

This indicator light provides ultra-bright status indication for almost any industrial application. Available in red, yellow, or green (or all three combined), these indicators feature an IP67, nickel-plated brass housing for harsh-duty applications.









Exchanger Brackets







Change your cylindrical sensor in seconds without losing the original position of the sensor. Just slide in the replacement sensor, tighten the nut, and the sensor retains its precise location.

Want more information?
Simply go to: www.sensing.net/inductive















Counters, Timers, and Controls

						
	Batch Controller	Batch Controller	Batch Controller	Meter Display	Hour/Pulse Count	Temperature Display
Series	KC	KC	KCT	DA5	KH	KT
Functions	Counter/Timer/Rate	Counter/Timer/Rate		Voltage or 4-20 mA display	Preset/reset value	Temperature display
Outputs	Relay or transistor	Relay or transistor	Transistor	Relay	Transistor	Display or relay
Size	48 x 48 mm	48 x 96 mm	24 x 48 mm	28 x 48 mm, 48 x 96 mm	24 x 48 mm	28 x 48 mm, 48 x 96 mm
Features	Presets, counting, ext. reset, add, subtract	Presets, counting, ext. reset, add, subtract		Linearization	Hour/operating timer display	Thermocouple inputs, control functions, 0.1° resolution
Display	LED, LCD	LED	LED	LED	LCD	LED

Amplifiers and Controls

						
	Sensor Signal Converters	Sensor Signal Converters	Isolated Switch Amplifier	Standstill Monitor	Speed Monitor	Frequency Converter
Series	KCD2	KCD2	KFA6	KFD2	KFU8	KFU8
Type	E	R	SR	SR2	DW	FSSP, UFT
Functions	NAMUR to 3-wire DC	3-wire to relay	Dual 3-wire sensor inputs sensor supply	Speed/pulse detection	Speed limit detection	Frequency to voltage/current
Outputs	Relay or transistor	Relay	Relay			
Mounting	DIN rail	DIN rail	DIN rail	DIN rail	DIN rail	DIN rail
Features			Isolated inputs, universal power input			Isolated inputs, universal power input

Sensor Accessories

														
	Teflon Protective Cover	Die-Cast Mounting Bracket	Universal Mounting Bracket	Adjustable Mounting Bracket	Snap Lever Bracket	Right Angle Brackets	Cushioned Mounting Bracket/Blocks	Conduit Adapters	Exchanger Brackets	Sensor Testers	Sight Glass Mounts	End Stop Adapter	Unistrut Brackets	Mounting Flanges
Highlights	<ul style="list-style-type: none">• PTFE cap• Protects against impact and weld spatter• For all 12, 18 and 30 mm diameter sensors	<ul style="list-style-type: none">• Cylindrical sensor mount• 1/2" rod clamping style• For all 12, 18 and 30 mm diameter sensors	<ul style="list-style-type: none">• Holds all cylindrical sensors• 360° rotational positioning in both x & y axis	<ul style="list-style-type: none">• Holds all cylindrical sensors• Holds fiber optic cables• Diameter size available for 4 mm to 30 mm	<ul style="list-style-type: none">• For all 8, 12, 18 and 30 mm diameter sensors• Easy sensor mounting with one lever• Stop shoulder maintains sensing gap	<ul style="list-style-type: none">• For all 12, 18 and 30 mm diameter sensors• Stainless steel construction	<ul style="list-style-type: none">• For all 12, 18 and 30 mm diameter sensors• Spring-loaded bracket absorbs impacts• Easy installation	<ul style="list-style-type: none">• For all 12, 18 and 30 mm diameter sensors• Converts metric-threaded sensors to 1/2" NPT thread	<ul style="list-style-type: none">• Easily remove and install sensors without readjustments• For all 12, 18 and 30 mm diameter sensors• Stop shoulder maintains sensing gap	<ul style="list-style-type: none">• Tests inductive, capacitive, ultrasonic & photoelectric sensors• Small handheld size• Models available for DC, AC and AC/DC types	<ul style="list-style-type: none">• For 30 mm capacitive sensors• Attaches sensor to sight glass for level monitor• Accommodates glass or plastic 9.5 to 38 mm diameter tubes	<ul style="list-style-type: none">• For 8 mm shielded inductive sensors• Spring-loaded piston triggers sensor• Available in 25 and 50 mm lengths	<ul style="list-style-type: none">• For all limit switch style sensors• Secures sensor to standard Unistrut™ Rail• Can be rotated 360° in 1.87° increments	<ul style="list-style-type: none">• Capacitive models keep tanks sealed if sensor is removed• Made of durable Teflon® or Delrin® material• Ultrasonic unit has thru-hole

Ultrasonic Sensors

- Long-range detection of all solid, liquid and granular targets
- Sensing ranges to 6 m
- 12 mm, 18 mm, 30 mm diameter, as well as rectangular housings
- Multiplex and synchronize ability for multiple sensors
- Discrete or analog outputs
- Special models for sheet, splice, and label detection
- Teflon-coated models for chemical resistance



The Leader in Double Sheet Detection Technology

Pepperl+Fuchs continues to set the standard with our double sheet detection technology designed for a wide range of process applications. Our 18 mm diameter double sheet detectors identify misfeeds of a variety of media, including paper, cardboard, thin plastic, foil, and labels.

Double sheet detectors are IP67 protected and provide a highly accurate and low-cost method of detecting zero, one or two sheets of material. The sensors feature a TEACH mode, and the detection threshold is easily adjusted to the appropriate material thickness for each specific application. Additionally, they are insensitive to printing, colors and glossy surfaces; even transparent materials can be monitored without sacrificing any accuracy. Changes in ambient conditions are compensated for automatically.



UGB Splice Detector

Pepperl+Fuchs reintroduces our splice detector in a new, smaller package. It is designed to sense splices in high-speed applications and to ignore differences

in color. Featuring two 18 mm diameter sensing heads, this sensor is compact and easy to mount. Dual outputs indicate a splice or no sheet (air) condition.



ULB Label Detector

The newest version of our label detector is compact and high-speed. It is engineered to detect labels on a roll independent of color, printing or

glossiness. High-speed applications are no problem for this sensor with its 600 μ s response time. Separate outputs are available for the label and the label base. The ULB will automatically compensate for slowly changing ambient conditions.



Double Sheet Detection

Ultrasonic double sheet detection detects 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. Each model is equipped with four evaluation programs to detect a variety of materials. No TEACH-IN is required, and an output pulse extension of 120 ms is possible.

The 30 mm ultrasonic double sheet detectors offer the same features as the standard version while providing a larger (50 mm - 150 mm) separation range and the ability to detect thicker materials. The UDCM-30GM-o85 metal sheet detection sensor ensures that only one metal sheet feeds to the press by detecting the difference between a single or double sheet of metal.



F42

These rectangular sensors are available with sensing ranges from 400 mm to 5 m. This versatile series can be

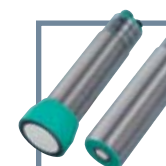
powered by AC or DC supplies and has a relay contact output. Unwanted targets can be suppressed using the built-in beam angle adjustment. Push buttons allow easy setup. Top or side-sensing models are offered for different mounting configurations.



Half-pint

Pepperl+Fuchs half-pint ultrasonics are now available with right-angle heads. They are perfect for tight spaces and restricted mounting conditions. Half

pints are available with a 300 mm or 800 mm sensing range, and with a switch point or analog output. Sensor status is easy to see from any angle with 360° viewable LEDs.



30 mm UC Series

Our flagship ultrasonic series, the 30 mm UC series sensors offer maximum versatility. Sensing ranges from 500 mm to 6 m, the ability to

communicate via RS-232 and multiple modes of operation make them usable in most applications. Advanced parameters such as sensitivity, evaluation method, burst time, and more can be adjusted through Ultra 3000 software. Dual switch point or analog outputs are offered to suit any positioning or level control applications.



F12 Series

The long range, F12 series sensors feature a durable die-cast zinc frame that's virtually indestructible and quickly becoming an industry

standard. Highly adaptable, models are available with potentiometer or with pushbutton programming, adjustable beam width settings, temperature compensation, and a 4-20 mA, 0-10 V, or a flexible 4-in-1 output configuration. Up to ten F12 units can be mounted in close proximity with no mutual interference. High visibility LEDs and an M12 connection that allows 90° rotation contribute to making the F12 a multi-purpose sensor series for a wide variety of markets and applications.











Want more information?

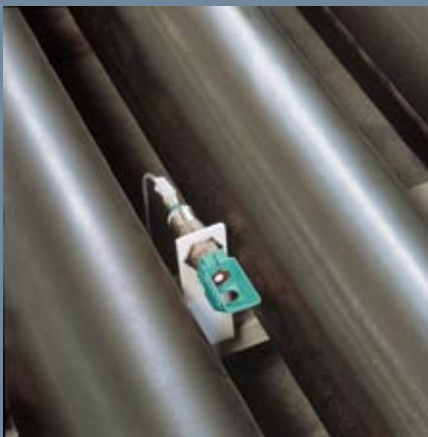
Simply go to: www.sensing.net/ultrasonic



Ultrasonic Sensors

Cylindrical and Surface Mount

	 12 mm Diameter	 18 mm Diameter	 30 mm Diameter	 30 mm Diameter AC	 Remote Transducer	 Limit Switch	 F42	 Flat Pack	 F12	 Double Sheet/Label/Splice Detection
Highlights	<ul style="list-style-type: none">• Smallest cylindrical housing available• NPN or PNP output• Temperature compensation	<ul style="list-style-type: none">• Selectable beam widths• Straight and right-angle sensing heads	<ul style="list-style-type: none">• Up to 6 m sensing range• External sensor multiplex/synchronization input	<ul style="list-style-type: none">• AC power• 360° LED visibility• Fingertip range adjustment	<ul style="list-style-type: none">• Allows mounting in tight locations• Dual independent transistor outputs• 3 modes of operation	<ul style="list-style-type: none">• DIP switch or RS-232 programmable• Programmable filters provide exceptional output stability	<ul style="list-style-type: none">• AC/DC, top or side sensing with relay output• Pushbutton programming	<ul style="list-style-type: none">• Can be extended to 9 m sensing range• Dip switch or RS-232 programming• Bright power and status output LEDs	<ul style="list-style-type: none">• Push/pull output• 90° connector rotation• High-visibility LEDs• Teachable	<ul style="list-style-type: none">• Outputs for single sheet, double sheet, and no sheet• 18 mm and 30 mm diameter models
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	70 - 500 mm 200 mm - 2 m	50 - 300 mm 120 mm - 1 m	300 mm - 6 m	50 - 500 mm 90 mm - 2 m 240 mm - 4 m 400 mm - 6 m	800 mm - 6 m	50-800 mm	Separation 20 - 60 mm (18 mm) 50-150 mm (30 mm)
AC Switch Point Output				■						
AC/DC Switch Point Output							■			
DC Single Switch Point Output	■	■	■						■	
DC Dual Switch Point Output		■	■		■	■	■	■		
Analog Voltage Output	■	■					■		■	
Analog Current Output	■	■					■		■	
Analog Current & Voltage Output		■	■		■	■		■		
DC Thru-Beam		■	■			■				■
Chemically Resistant			■							
Hazardous Area Versions			■							
Electrical Connection	Micro	Micro	Micro	Mini	Micro	Terminal connection	Micro, mini	Terminal connection	Micro	Cabled



Typical Applications:

- Fill level detection
- Web loop control
- Positioning
- Low monitoring
- Conveyor transfer

Accessories



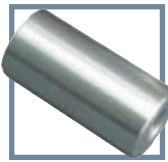
Right-Angled Deflector

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



Mounting Wells

Mounting wells are available in a 30 mm diameter durable Teflon® material that has a thru-hole for ultrasonic sensing. Teflon® is a registered trademark of E.I. DuPont de Nemours & Co.



Conduit Adapter

For hazardous locations, Pepperl+Fuchs provides a 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 1-1/4 in. NPT threads in Class I Div. 2, Class II Div. 1 & 2, and Class III Div. 1 & 2.

Want more information?

Simply go to: www.sensing.net/ultrasonic

Photoelectric Sensors

■ Photoelectric technologies

- Diffuse
 - Background suppression
 - Standard diffuse
 - Convergent
 - Background evaluation
- Retroreflective
 - Polarized and standard retroreflective
 - Foreground suppression
 - Clear object detection
- Thru-beam
- Fiber optic
 - Glass or plastic fiber cables
- Color
- Contrast
- Luminescence
- Optical data couplers
- Light grids
- Retroreflective area sensors
- Laser distance measurement

■ Industry leading background suppression sensors

■ Twin families offer an economical series and a high tech series with the same mounting footprint

■ Subminiature, miniature, cylindrical, and rectangular industry standard housing

■ 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 great features you would expect in a larger, more expensive sensor, yet it comes in a compact, short housing that provides greater mounting flexibility. Designed with OEMs in mind, it is priced to beat the competition.



ML7 Series

Simple one pushbutton set-up and advanced cross-talk immunity complement this powerful and compact series. Two IP69K-rated housing styles and slotted mounting holes offer added versatility.



Laser Distance Measurement Sensors

Pepperl+Fuchs introduces a full line of laser displacement sensors available in short-, medium-, and long-range models. From a short 100 mm diffuse range to an extremely long 250 m retroreflective range, all models feature a Class 1 infrared or a Class 2 visible red laser for sensing. They also feature a Class 2 visible red laser for alignment. Outputs include analog, discrete, and several interface options.



ML6 Series

Offering remarkably precise background suppression sensing regardless of target color, this subminiature series performs in the most demanding applications.



ML17 Series

Compact, cost-effective, and convenient...the ML17 series, with its unique 4-in-1 output, sets a new standard in photoelectrics.



Series 31 Photoelectric Sensors

The Series 31 is Pepperl+Fuchs' smallest AC/DC photoelectric sensor available with an SPDT relay. It is also available in DC voltages with powerful 4-in-1 output. Unique are color-coded front labels which easily identify sensing modes. Models include diffuse, retroreflective, polarized retroreflective, and thru-beam. Other features include highly visible front LEDs and cable or quick disconnect options.



SU18 Series

The SU18 Series fiber optic sensors offer quality performance in a sensor designed with cost, performance and simplicity of use 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 is loaded with features including a 4-digit display, up to 16 kHz switching frequencies, gang mounting capabilities with built-in cross-talk protection, and the ability to detect clear objects.



DK12 Contrast and DF12 Color Sensors

Rugged and compact, the DK12 and DF12 family's newest additions are a high-precision contrast sensor and a three-channel color sensor. The contrast sensor offers four programming modes and has three color LEDs. During programming, the sensor automatically selects the best LED for the application.



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.

Want more information?

Simply go to: www.sensing.net/photoelectric

Subject to modifications without notice

Pepperl+Fuchs Group
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PEPPERL+FUCHS
SENSING YOUR NEEDS

Photoelectric Sensors

											
	KT9 Series	KT11 Series	GLV12 Series	GLV18/GLK18 Series	Basic Series 18 mm	V18 Series	ML17 Series	MHP Series	ML3 Series	ML4.2 Series	ML6 Series
Highlights	• Alternative to fibers; wide beam angle	• Alternative to fibers; wide beam angle	• 12 mm dia. metal housing with sensitivity adjustment	• Most economical 18 mm dia. photoelectric; straight and right-angled housings	• Compact and cost-effective 18 mm dia. metal housing	• Rugged metal 18 mm dia. family with straight and right-angled housings	• Compact, cost-effective, industry-standard housing	• Rugged housing suitable for 1200 psi washdown	• Ultra miniature housing; wide range of apertures	• Best background suppression available in miniature housing	• Superior background suppression for general-purpose use
Convergent Beam Mode								25, 63 mm	30 mm		
Diffuse Mode with Background Suppression				120 mm		120 mm	50, 100 mm			20, 40, 60, 80 mm	20, 40, 60, 80, 120 mm
Diffuse Mode	50 mm	50 mm	200 mm	200, 400, 450 mm	200, 500 mm	400 mm	450 mm	150, 450 mm			
Retroreflective Mode			1, 2 m	3.5, 4, 5.5, 6.5 m	4 m	3.5, 15 m	3.5, 6.5 m	2.4, 9.1 m		4 m	4 m
Retroreflective Mode Clear Object Detection				2.5 m							
Retroreflective Mode with Foreground Suppression											
Thru-Beam Mode	250 mm	250 mm	5 m	12, 20 m	10 m	60 m	20 m	30.4 m	1.5 m		
Fiber Adaptable											
Housing H x W x L (mm)	4 mm dia. (35, 45 mm lengths)	M5 dia. (35, 45 mm lengths)	M12 dia. (55, 65 mm lengths)	M18 dia. various lengths	M18 dia. various lengths	M18 dia. various lengths	29 x 15 x 35	30 x 16 x 65	32 x 8 x 12	33 x 14 x 18	33 x 14 x 18
Light Source	Infrared	Infrared	Visible red	Visible red	Infrared, visible red, laser	Visible red, laser	Infrared, visible red	Infrared, visible red	Infrared, visible red	Infrared, visible red	Visible red
Power Supply	DC	DC	DC	DC, AC/DC	DC	DC	DC	DC, AC	DC	DC	DC
Output Type	NPN, PNP	NPN, PNP	NPN, PNP	NPN, PNP, thyristor	NPN, PNP	4-in-1	4-in-1	NPN, PNP, thyristor	NPN, PNP	4-in-1	4-in-1
Electrical Connection	Nano, cabled	Nano, cabled	Micro, cabled	Micro, cabled	Micro, cabled	Micro	Micro, nano, cabled	Micro, cabled	Cabled	Nano, cabled	Nano, cabled



Typical Applications:

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

Accessories



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



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



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

Want more information?
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Photoelectric Sensors

Continued

	 ML7 Series	 ML8 Series	 ML100 Series	 MLV12 Series	 MLV41 Series	 Series 31	 Series 23	 Series 28
Highlights	• Fast "teach in"; rated for severe washdown	• Basic tamper-proof miniature housing; sensing arrays	• Long-range miniature housing; powerful light source	• Rugged die-cast metal housing frame	• Rugged metal housing; front and rear LEDs; powerful performance	• Color-coded front label to identify sensing mode	• Sharp cut-off and long-range background suppression; timer versions	• Low operating temperature; highly visible LEDs; timer versions
Convergent Beam Mode		30, 50, 220 mm				300 mm		
Diffuse Mode with Background Suppression	140, 350 mm	30, 50, 140, 350 mm	350 mm	250 mm	350 mm		500 mm, 1, 2 m	400, 700 mm, 1.5, 2 m
Diffuse Mode with Background Evaluation				150 mm				
Diffuse Mode	200 mm	200 mm	1 m			1.2, 2.5 m		
Retroreflective Mode	2.5 m	2.5 m	5 m	450 mm, 5, 15 m		9, 12 m		12, 30 m
Retroreflective Mode Clear Object Detection	3.5 m			3 m	3 m			5.6 m
Retroreflective Mode with Foreground Suppression								9 m
Thru-Beam Mode	3.5 m		10, 20 m	16 m		30 m		30, 65, 300 m
Fiber Adaptable					■			
Housing H x W x L (mm)	39 x 11 x 23	39 x 11 x 23	34 x 11 x 20	65 x 15 x 42	60 x 14 x 31	62 x 18 x 35	91 x 27 x 68	Varies
Light Source	Infrared, visible red	Visible red	Visible red	Infrared, visible red, laser	Infrared, visible red	Infrared, visible red	Infrared, visible red	Infrared, visible red, laser
Power Supply	DC	DC	DC	DC	DC	AC/DC, DC	AC/DC, DC	AC/DC, AS-Interface, DC
Output Type	4-in-1, NPN, PNP	NPN, PNP	NPN, PNP	4-in-1, NPN, PNP	4-in-1	4-in-1, relay	NPN, PNP, relay	NPN, PNP, 4-in-1, relay, AS-Interface
Electrical Connection	Micro, nano, cabled	Micro, nano	Nano, cabled	Micro, cabled	Micro, nano, cabled	Micro, cabled	Micro, terminal connection	Micro, mini, cabled, terminal connection



- Typical Applications:
- 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

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 Series 23 and Series 28 models.







OMH-MLV12-C
OMH-RL28-C
Weld slag covers for the MLV series, Series 28, and Series 23 models.
29 models featuring Black Armor™ coating and replaceable glass lens.

Want more information?
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Photoelectric Sensors

Continued

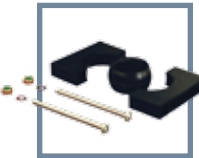
										
	Series 29	Series 61	M1K Series	GL2 Series	GL3 Series	GL5 Series	GL Series	GLP Series	RAL Series	GLD3 Series
Highlights	<ul style="list-style-type: none">• Cost-effective long-range series	<ul style="list-style-type: none">• Multi-purpose, rugged IP67 housing, integral timers	<ul style="list-style-type: none">• 25-position head, cross-talk protection	<ul style="list-style-type: none">• Miniature design with high switching frequencies	<ul style="list-style-type: none">• 3- and 4-wire connections, easy mounting	<ul style="list-style-type: none">• Highly visible LED indication• Optimized for small part detection	<ul style="list-style-type: none">• Full range of slot widths available	<ul style="list-style-type: none">• Simple pushbutton or remote teach• Flexible mounting	<ul style="list-style-type: none">• One-piece slot light grid	<ul style="list-style-type: none">• Simple pushbutton programming for label detection
Convergent Beam Mode										
Diffuse Mode with Background Suppression	1.2 m	500 mm, 2 m								
Diffuse Mode	2 m	1 m, 4 m	300 mm							
Retroreflective Mode	7, 12 m	18 m	2 m							
Retroreflective Mode Clear Object Detection										
Retroreflective Mode with Foreground Suppression	6 m									
Thru-Beam Mode		60 m		1.8 mm	3.15 mm	5 mm	10 - 220 mm	30 - 120 mm	50-150 mm	3 mm
Fiber Adaptable										
Housing H x W x L (mm)	Varies	92 x 45 x 49	30 x 30 x 102	Varies	Varies	Varies	Varies	Varies	Varies	24 x 25 x 92
Light Source	Visible red	Infrared, visible red	Infrared, visible red	Infrared	Infrared	Infrared	Visible red	Visible red	Infrared	Visible red
Power Supply	AC/DC, DC	AC/DC, DC	DC	DC	DC	DC	DC	DC	DC	DC
Output Type	4-in-1, relay	4-in-1, relay	NAMUR	NPN	NPN	NPN, PNP	PNP	NPN, PNP	PNP	NPN, PNP
Electrical Connection	Micro, cabled, terminal connection	Micro, mini, cabled	Terminal connection	Cabled	Cabled	Cabled , 4-pin flat connector	Nano	Nano, 3- and 4-pin	Nano	Micro, nano, cabled



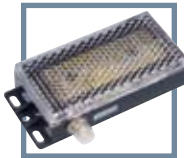
Typical Applications:

- 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

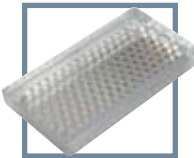
Accessories



MPZBo6
Swivel mounting bracket that 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.

Want more information?
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Photoelectric Sensors

Continued

	 SBL Series Conveyor Sensors	 Retroreflective Area Sensors	 Light Grids	 Low-Profile Light Grids	 Contrast Sensors	 Luminescence Sensors	 Color Sensors	 VDM18	 VDM28	 VDM100	 Optical Data Couplers
Highlights	<ul style="list-style-type: none">• Mounts between conveyor rollers• Reliably detects packages regardless of color• Integral timer, cascable, & pneumatic-valve versions	<ul style="list-style-type: none">• More sensing coverage than single beam; cost-effective alternative to light grids	<ul style="list-style-type: none">• Easy alignment of thru-beam• No remote amplifiers• Wide array of housings and configurations	<ul style="list-style-type: none">• Dense sensing field• For elevator and doorway monitoring• Automatic beam crossing configuration	<ul style="list-style-type: none">• Wide range of light sources and housing configurations• Mark detection, print verification, product positioning	<ul style="list-style-type: none">• Senses invisible and nearly invisible marks• Detects targets regular photoelectric and contrast sensors cannot	<ul style="list-style-type: none">• Identify minute color variation• Pushbutton programming• Versatile lens mounting	<ul style="list-style-type: none">• Short-range laser distance measurement sensor• Diffuse mode	<ul style="list-style-type: none">• Medium-range laser distance measurement sensor• Diffuse and retroreflective mode	<ul style="list-style-type: none">• Long-range laser distance measurement sensor• Retroreflective mode	<ul style="list-style-type: none">• Wireless data transfer over long distances• Parallel and serial data transfer• Replaces slip rings and drag cables
Classification	SBL	RLG28	PLVScan 300-3056 mm field height	AL21 9 mm profile, up to 135 beams AL20 12 or 16 mm profile, up to 94 beams AL40 12 or 16 mm profile, up to 194 beams	DK12 DK10 potentiometer programmable, laser versions DK(E)20, DK(E)21 pushbutton programmable DK34, DK35 low contrast	DK50-UV	DF20 single channel DF12 three channels VCS110 five or ten channels	VDM18-100 VDM18-300	VDM28-8 VDM28-50-R	VDM100-50 VDM100-150 VDM100-300	DAD15 - parallel DAD30 - serial (RS-232, RS-422, CL 20 mA) LS230-DA - serial (RS-232, RS-422, CL 20 mA) LS610-DA-P-serial (PROFIBUS)
Sensing Distance (max.)	900 mm	4 m	4, 8 m	3.5, 4 m	Varies	190, 254, 330, 609 mm	Varies	100, 300 mm	8, 50 m	50, 150, 300 m	1.5 - 240 m
Housing H x W x L (mm)	Varies	88 x 26 x 54	Varies	Varies	Varies	65 x 23 x 56	Varies	50 x 17 x 50	93 x 26 x 54	Varies	Varies
Light Source	Infrared	Visible red (6)	Infrared	Infrared	Green, red, or blue LEDs, laser	Ultraviolet	White, red, green, blue LEDs	Laser	Laser	Laser	Infrared, visible red
Power Supply	DC	DC	DC	DC	DC	DC	DC	DC	DC	DC	DC
Output Type	4-in-1	4-in-1	PNP	NPN, PNP	4-in-1, analog	NPN, PNP, analog	NPN, PNP	4-20 mA, PNP, RS-485	4-20 mA, 4-in-1	PROFIBUS, INTERBUS, EtherNet/IP, PROFINET, SSI	Varies
Electrical Connection	Micro	Micro	Terminal housing	Nano, cabled	Micro	Micro	Varies	Micro	Micro	Varies	Connectors, terminal connection



Typical Applications:

- 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

Accessories



OMH-LS610-01
Mounting bracket for fine adjustment of LS610 series optical data couplers.



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

IO-Link® is a registered trademark of ifm electronic GmbH.



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

Want more information?
Simply go to: www.sensing.net/photoelectric

Photoelectric Sensors

Fiber Optic Amplifiers



	SU18 Series	SU19 Series	SU17.1 Series
Highlights	• Powerful general-purpose fiber optic sensing; potentiometer and pushbutton versions	• Expandable fiber optic sensing; 4-digit display	• Built-in auto teach; dual 4-digit displays
Indication	LEDs (2)	LEDs (2), 4-digit display	LEDs (1), dual 4-digit displays
Sensitivity Adjustment/Teach	Potentiometer (1), Pushbutton (1)	Potentiometer (4)	Pushbutton (4)
Timer Function	On delay, off delay	On delay, off delay, 1-shot	On delay, off delay, 1-shot
Switching Frequency	6 kHz	16 kHz	8 kHz
Fiber Adaptable	■	■	■
Housing H x W x L (mm)	35 x 9 x 55	35 x 9 x 55	34 x 10 x 71
Light Source	Visible red	Visible red	Visible red
Power Supply	DC	DC	DC
Output Type	4-in-1	4-in-1	NPN, PNP
Electrical Connection	Nano, cabled	Cabled	Micro pigtail, cabled



Typical Applications:

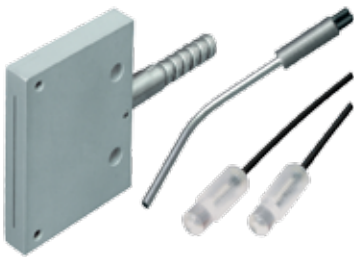
- Packaging: check weighing
- Material handling: automated guided vehicle location
- Printing: web control
- Automotive: detect presence of Loctite® on weld studs
- Elevators: people detection
- Automotive: luminescence sensor detects presence of engine lubricants

Loctite® is a registered trademark of the Henkel Loctite Corporation.

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

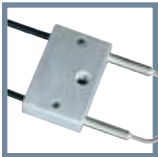


Reflectors

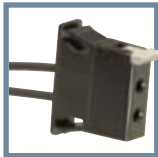
- Wide variety of materials, shapes, sizes & reflectivity
- High/low temperature, microstructure and a large selection of mounting options
- Self-adhesive reflective tape and foils also available



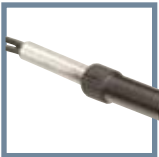
Accessories



HPF-To22-H
Specialty fiber with metal casing designed for label detection.



HPF-EU05
Small extension cord for fiber optic cables.



HPF-LU01
Fiber optic lens adapter converges light spot diameter to 0.4 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.

Want more information?
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Rotary Encoders

- Optical encoder technology for rugged industrial environments
- Incremental encoders up to 50,000 pulses per revolution
- Absolute encoders up to 30 bit resolution
- Industry standard sizes – 50 mm (2"), 58 mm, and 2.5"
- Solid shaft, hollow shaft and recessed hollow shaft models
- Magnetic noncontact incremental encoder system



A Complete Overview of Pepperl+Fuchs Rotary Encoders

Rotary encoders are used to provide accurate position measurement and speed feedback in many machine and system control environments. Pepperl+Fuchs is proud to offer a complete line of incremental and absolute rotary encoders in solid and hollow shaft designs for virtually every industry application.

Pepperl+Fuchs rotary encoders are crafted using state-of-the-art components and the latest technologies to ensure precision, reliability, and functionality. We've been supplying rotary encoders for over 25 years and have the experience to solve your most difficult rotary or linear measurement problems.



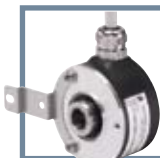
RV125

The RV125 is a rugged, industry-standard, 2.5" incremental encoder with a wide variety of options. With resolutions up to 5,000 ppr available, this encoder is ready for most applications. Multiple flange types and connection options, including mil-spec connectors, make it simple to integrate. Available with 1/4" and 3/8" shaft sizes.



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") it can fit in the tightest spaces. The tangential cable exit allows the cable to be positioned either axially or radially. These units also feature a metal code disc and Opto-ASIC technology for high reliability. Output resolutions are available up to 1,024 ppr.



RVI58/RHI58

The small, hollow shaft RHI58 encoder is available with resolution up to 50,000 ppr while the solid shaft RVI58 provides 50,000 ppr for precise positioning applications. Shaft bore sizes on the RHI58 include 10 mm, 12 mm, and 1/2". Solid shaft models are available with 6 mm, 10 mm, or 12 mm shaft diameters. Both models measure 58 mm in diameter and are held in place with the included torque rest.



RVI58L

This is an all stainless steel version of the RVI58 encoder. It is especially suited for applications in the food industry. This rugged encoder is IP69k steam jet-proof, certified according to EHEDG, and approved for ECOLAB detergents.



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". With a metal code disc these encoders are engineered to take abuse. Designed for high shock and vibration. They provide resolutions up to 2,500 ppr.



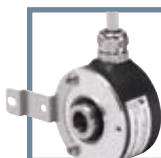
DVS/DVM58

DeviceNet absolute encoders now have up to 30-bit resolution: up to 16-bit for single-turn and 14-bit for multi-turn. They are designed for the most precise positioning applications with 65,536 steps per turn. Diagnostic LEDs are integrated into the removable housing cover to make troubleshooting quick and easy.



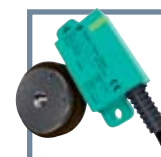
EVS/EVM58

Our industrial network/fieldbus encoder portfolio includes Ethernet IP and PROFINET absolute encoders. They provide resolutions up to 16-bit for single-turn and 30-bit for multi-turn units.



RHS58

The RHS58 incremental encoder offers a sine/cosine output in a hollow shaft housing. Shaft bore sizes include 10 mm, 12 mm, and 15 mm. Output resolutions include 1,024 and 2,048 signal periods per revolution. The sin/cos signal allows easy interpolation at the controller for higher resolutions. The encoder has a full complement of six signal outputs and maximum frequency of 200 kHz. The included torque rest holds the encoder in place.









MNI40







These magnetic encoders utilize the latest technologies to achieve high-accuracy feedback for incremental encoder feedback. This two-piece design enables the magnetic code wheel to be mounted directly to a machine shaft. Easy to use, with convenient setup diagnostics, the MNI40 provides reliable, long-life service in difficult applications.





Want more information?

Simply go to: www.sensing.net/encoder





Incremental Rotary Encoders






						
	RH158	RS158	RV158	RVI50	RVI78	RH190
Diameter	58 mm	58 mm	58 mm	50 mm	78 mm	90 mm
Max. PPR	50,000	50,000	50,000	2,500	5,000	50,000
Shaft Type	Hollow	Semi-hollow	Solid	Solid	Solid	Hollow

						
	TVI40	TSI40	THI40	TVI50	TVI58	THI58
Diameter	40 mm	40 mm	40 mm	50 mm	58 mm	58 mm
Max. PPR	1,024	1,024	1,024	1,024	1,500	1,500
Shaft Type	Solid	Semi-hollow	Hollow	Solid	Solid	Hollow





					
	RHS58 Sine-Cosine	RHS90 Sine-Cosine	MNI40N Magnetic	RVI25 Square Flange	RVI58L Stainless Steel
Diameter	58 mm	90 mm	40 mm	63 mm	58 mm
Max. PPR	2,048	2,048	3,600	5,000	5,000
Shaft Type	Hollow	Hollow	Mag wheel	Solid	Solid

Absolute Rotary Encoders

Single Turn (65,536) Multi-turn (16,384) 58 mm diameter				
EtherNet IP	ESS58/ESM58	EVS58/EVM58		
ProfiNet	ESS58/ESM58	EVS58/EVM58		
CANopen			CSS58/CSM58	CSS58/CSM58
DeviceNet			DSS58/DSM58	DSS58/DSM58
ProfiBus			PSS58/PSM58	PSS58/PSM58

					
SSI	ASS58/ASM58	AVS58/ASM58	AHS58/AHM58		
AS-Interface				BSS58/BSM58	BVS58/BVM58
Single Turn	65,536	65,536	65,536	8,192	8,192
Multi-turn	16,384	16,384	16,384	4,096	4,096




Absolute Magnetic Encoders, Safety Encoders

Single Turn (8192) Multi-turn (4096) 36 mm diameter				
	Absolute Magnetic Encoders		Safety Encoders	
SSI	AVS36M/AVM36M	ASS36M/ASM36M		
CANopen	CVS36M/CVM36M	CSS36M/CSM36M		CVS58S/CVM58S
Sine/Cosine			RVS58S Incremental	Absolute

Want more information?
Simply go to: www.sensing.net/encoder

Hazardous Area Rotary Encoders

Incremental Rotary Encoders

			
Series	Series 14	RVi84	RVi58X/RSi58X
Diameter	116 mm	78 mm	58 mm
Max. PPR	5,000	25	5,000
Ignition protection class	Ex d	Ex i	Zone 2/22

Absolute Rotary Encoders

				
Series	Absolute Ex	Absolute Ex	Absolute Ex	Absolute Ex
Diameter	58 mm	58 mm	116 mm	116 mm
ProfiBus	PSS58X/PSM58X	PVS58X/PVM58X	PVS14/PVM14	
SSI				AVS14/AVM14
CANopen				CVM58
DeviceNet				DVM58
Ignition protection class	Zone 2/22	Zone 2/22	Ex d	Ex d

Accessories

Couplings



- Spring steel coupling
- Spring disk coupling
- Bellows coupling
- Precision coupling
- Helix coupling

Connectors



- Amphenol
- Coninvers
- SUB-D
- Souriau

Cable Pulls



- Measuring ranges:
- 1,000 mm
 - 2,000 mm
 - 3,000 mm
 - 5,000 mm
 - 15,000 mm

Want more information?
Simply go to: www.sensing.net/encoder



AS-Interface

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

- Flat cable reduces complex, expensive network architectures
- Reduces installation costs and time by more than 40%
- Immediate error detection and fault handling
- 992 I/O on one gateway
- Network lengths exceed 500 m
- Automatic node replacement simplifies maintenance
- Safety and standard I/O integrate into the same network
- Safety is fully NFPA 79, c(UL), and TÜV approved



Reference & Buyer's Guide: AS-Interface Products

The *Reference & Buyer's Guide: AS-Interface Products* features over 200 pages of the latest technology, market and application updates, and detailed product specifications.

AS-Interface is a very popular wiring system for discrete I/O, analog, and safety products. The two-conductor flat cable is used to carry both communication and power to all nodes on the network. Modules are simply addressed, attached to the flat cable, and the system is up and running, with no software required! Additions to the catalog include:

- AS-Interface 3.0 allows 62, 4 in/4 out modules on network
- New safety interlock switches for use on doors and gates
- New magnetic and RFID safety door interlocks
- New G12 quick connect flat modules with SPEEDCON
- New G16 series compact modules with output overload indication
- Intelligent stacklights connect directly to AS-Interface
- E-stops in field mount, panel mount, illuminated, and non-illuminated versions



CANopen™ is a trademark of CANopenVendor Association.
ControlLogix™ is a trademark of Allen Bradley.
DeviceNet™ is a trademark of Open DeviceNet Vendor Association (ODVA).
EtherNet/IP™ is a trademark of Open DeviceNet Vendor Association (ODVA).

Modbus® is a registered trademark of Modbus-IDA.
PROFIBUS® is a registered trademark of PROFIBUS International.
PROFINET® is a registered trademark of Deutsche Telekom Ag Corporation.
SPEEDCON® is a registered trademark of Phoenix Contact.



I/O Modules

Pepperl+Fuchs has a very wide selection of I/O modules to choose from. Many field mountable options are available including versions for very harsh environments with IP69K protection. The innovative G11 series has a simple clean design and is available for M12 or flat cable AS-Interface connection. Other popular I/O modules include the enclosure mount KE series. New versions are available with lead breakage detection and input port filtering. Any application can be solved with this wide assortment of I/O modules.



Allen-Bradley Scanners

The compact I/O AS-Interface scanner and the ControlLogix™ AS-Interface scanners are important additions to the already popular SLC500 AS-Interface card. Digital and analog I/O can be brought directly into the PLC. All AS-Interface modules are directly mapped into the I/O tables in fixed locations based on the AS-Interface address, making programming easy and intuitive.



Advanced Gateways

The K20 series are low profile, stainless steel AS-Interface gateways, designed for connection to PROFIBUS, DeviceNet and Ethernet. In addition to a graphical display, these gateways can detect a ground fault on AS-Interface and determine duplicate address errors. Other distinguishing features include built-in noise and over-voltage detection on the AS-Interface network. Along with the network connection, an extra serial port can be plugged into a PC and advanced diagnostics are displayed. EtherNet/IP and DeviceNet gateways are the workhorse for the North American market and allow customers to quickly and inexpensively connect safety devices to their PLC. The gateways support the latest AS-Interface enhancements in Specification 3.0 and provide full support for 62 nodes with 4-in and 4-out each.



Safety Monitor with Integrated Gateway

These new controllers make a functional safety network easy to setup. A single AS-Interface connection to the safety controller completely powers up the unit and allows complete control of the standard/safety AS-Interface network. The wiring is reduced, and because the gateway and safety monitor are in the same housing, the retrieval of diagnostic data is instantaneous. In the past, diagnostic data traveled over AS-Interface requiring slow update times, but not any more. PROFIBUS, Ethernet/IP, and Modbus/TCP versions are available.



Power Supplies

The K17 and K24 Series of power supplies provide 4 A (K17) or 8 A (K24) to a single AS-Interface network. Their narrow, 70 mm housing allows mounting almost anywhere. Power and overload indication give an easy visual indication of proper operation. Also available is the K17-CL2, a Class 2 power supply that provides 100 VA of power to the field. Smaller AS-i networks can also take advantage of a lower cost 1.8 A supply.



Handheld Programmer

Setting node addresses could not be easier with the handheld programmer. Features include reading the device profile, reading inputs, writing the outputs, and parameter simulation. New 3.0 handhelds offer quicker programming, safety sequence checking, and can now set outputs on all 4 in/4 out 3.0 AS-Interface modules.



Safety

An industry-leading family of emergency stop (e-stop) switches with integrated Safety at Work (SaW) functionality is available from Pepperl+Fuchs. These intelligent e-stop switches are powered by the AS-Interface network and offer fast, error-free installation in field- or panel-mount applications. Field- and panel-mount models are available in high intensity, wide-angle illuminated versions, as well as non-illuminated versions, to suit any e-stop application requirement.

Want more information?

Simply go to: www.sensing.net/as-interface

Subject to modifications without notice

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PEPPERL+FUCHS
SENSING YOUR NEEDS

Gateways



	Enhanced	Safety Controller with Enhanced Gateway	Basic with Display	Basic
Highlights	<ul style="list-style-type: none">Duplicate address detection and RS-232 portOne and two network versions available	<ul style="list-style-type: none">Duplicate address detection and RS-232 port16 channels for safe AS-i outputs, safe network coupling, and four OSSDs	<ul style="list-style-type: none">RS-232 version comes with stand-alone control functionalityOne and two network versions available	<ul style="list-style-type: none">Low-profile slim housing with top-mount connectorLCD display with pushbuttons
Specification and Profile	3.0 (M4)	3.0 (M4)	3.0 (M4)	3.0 (M4)
PLC Connectivity				
EtherNet/IP, Modbus/TCP	■	■		
PROFINET	■			
PROFIBUS	■	■	■	■
DeviceNet	■		■	
Modbus	■			
RS-232			■	
Diagnostics				
RS-232 Port	■	■		
Ground Fault Detection	■	■	■	■
Noise Detection	■	■	■	■
Duplicate Addr. Detection	■	■		
Over Voltage Detection	■	■	■	■
Approvals	CE cUL US AS	CE cUL US AS	CE cUL US AS	CE cUL US AS
Safety				
Safe Outputs (onboard)		2 relay and 2 electronic		
Safe AS-i Output Channels		16		
Safe Network Coupling		■		
Scan 2 Networks		■		
Memory Card	■	■		
Graphical Display		■		
CAT 4/SIL 3 Approved		■		

Scanner Cards



Allen-Bradley	
Highlights	<ul style="list-style-type: none">AS-i connected to backplane of PLCMany scanner cards can be connected to one rack
Specification and Profile	3.0 (M4)
PLC Connectivity	
SLC503/04/05	■
MicroLogix 1500	■
ControlLogix	■
CompactLogix	■
Diagnostics	
RS-232 Port	■
Ground Fault Detection	
Noise Detection	
Duplicate Addr. Detection	
Over Voltage Detection	
Approvals	CE cUL US AS

Network Extension



Repeaters	
Highlights	<ul style="list-style-type: none">Field mount or enclosure mount housingsBuilt-in terminator, 300 m one repeater
Length of First Segment	100 m, 200 m
Length of Second Segment	100 m
Protection Rating	IP20 and IP67
Communication Monitoring	■
AS-i Connection	Flat cable piercing or terminals



Terminator



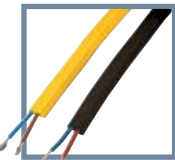
Tuner

Highlights	<ul style="list-style-type: none">Extends linear network to 200 m without repeaterLow voltage diagnostic LEDs	<ul style="list-style-type: none">Extends linear network to 300 m without repeaterNetwork communication and diagnostic LEDs
Length of Segment (linear topology only)	200 m	300 m
Protection Rating	IP65	IP65
Communication Monitoring		■
AS-i Connection	Micro	Flat cable piercing or micro

Accessories



Control Tools Software
Diagnostic and visualization software for most gateways/scanners.







Flat AS-i Cable
Comes in black or yellow in 100 m box or 1000 m spool.






Power Supplies
Every network needs an AS-Interface power supply. Don't forget to look at our wide selection of power supplies ranging from 1.8 A up to 8 A.

Want more information?
Simply go to: www.sensing.net/as-interface



Safety Interlock Switches

				
	Mechanical	Coded Magnetic	RFID	Enabling Switch
Highlights	<ul style="list-style-type: none">• Steel actuator head• Key and coil monitoring• High-visibility LEDs	<ul style="list-style-type: none">• Direct connection to AS-Interface• 1 m pigtail integrated• IP67 for harsh environments• Small mounting footprint	<ul style="list-style-type: none">• High-end RFID solution replaces magnetic interlocks• Up to 4 doors monitored from one control unit• Long read range for worry free alignment• High-visibility diagnostic LEDs	<ul style="list-style-type: none">• Lightweight enabling switch• Rugged rubberized housing• Ergonomic design
Input Type	Safety, mechanical	Safety, magnetic	Safety, RFID	Safety, mechanical
Input Activations	1,000,000	100,000,000	Unlimited	100,000
Input Powered By	AS-Interface	AS-Interface	AS-Interface	AS-Interface
Output Type	Solenoid/LEDs			
Output Powered By	AS-Interface/aux.			
CAT 4/SIL 3 Approved	■	■	■	■

Safety Modules








































			
	Safe Inputs	E-Stops	Safe Outputs
Highlights	<ul style="list-style-type: none">• Dry-contact inputs for connection of standard e-stops and gate switches• Electronic inputs for connection of light curtains or any device with electronic OSSDs	<ul style="list-style-type: none">• AS-i safety e-stop connects directly to AS-i cable• Field mount or panel mount e-stop housings• Available with or without illumination	<ul style="list-style-type: none">• One set of redundant relay outputs• EDM and status inputs• One address for safety output channel• One A/B address for diagnostics
Safe Inputs	1 or 2	1 E-Stop	-
Safe Relay Outputs	-		1
Standard Inputs/Outputs	2 out	1 out (LED)	1 in/1 out (LED)
CAT 4/SIL 3 Approved	■	■	■

Safety Monitors

		
	2-Channel Basic	16-Channel Enhanced
Highlights	<ul style="list-style-type: none">• Scans up to 31 safe input modules• 1 channel for safe AS-i outputs	<ul style="list-style-type: none">• Scans up to 62 safe input modules on two networks• 16 channels for safe AS-i outputs
Safe Outputs (onboard)	1 or 2 relay	2 (relay) or 4 (2 relay and 2 electronic)
Safe AS-i Output Channels	1	16
Safe Network Coupling	■	■
Scan 2 Networks		■
Memory Card		■
Graphical Display		■
CAT 4/SIL 3 Approved	■	■

Want more information?
Simply go to: www.sensing.net/as-interface

I/O
Modules

											
	Flat (G2)	Flat (G12)	Round (G11)	Field (G4)	Compact (G16)	Enclosure (KE)	Junction Box (KE1)	Junction Box (CB1)	Analog (G4, G11, KE2)	Pushbuttons and Stack Lights	Pneumatic
Highlights	<ul style="list-style-type: none">Low-profile flat housingIntegrated addressing jack	<ul style="list-style-type: none">Overload indication at each outputNo tools required for installationSPEEDCON connectors	<ul style="list-style-type: none">IP69K for harsh environmentsRound clean designM12 or flat AS-i connection	<ul style="list-style-type: none">Input wires can be cut to exact lengthAnti-vibration spring terminals	<ul style="list-style-type: none">Smallest field mount housing offeredWaterproof potted housing	<ul style="list-style-type: none">Thinnest housing offeredAS-Interface or external power, switchableApproved for hazardous locations	<ul style="list-style-type: none">Low-profile housingEasy connection for pushbuttons & pilot lightsAnti-vibration spring terminals option	<ul style="list-style-type: none">Lowest profile housing availableFully pottedMounting strips included	<ul style="list-style-type: none">Scaled automatically 0-10,000 or 4,000-20,000Powered from AS-Interface or auxiliary	<ul style="list-style-type: none">Different colored button covers availableRed, yellow, green, blue, clear stack light optionsAudible alarm	<ul style="list-style-type: none">4 inputs available in 2 connectorsPneumatics powered from AS-Interface or auxiliary
AS-Interface 3.0 (4 In/4 Out)											
Address Range	1-31 A/B	1-31 A/B	1-31 A/B	1-31 A/B	1-31 A/B	1-31 A/B	1-31 A/B	1-31 A/B	1-31 A/B	1-31 A/B	1-31 A/B
I/O Mix	4 in, 4 in/2 out, 4 in/4 out, 4 in/3 out, 2 in/2 out, 8 in	4 in, 4 in/4 out, 2 in/2 out, 4 out, 8 in	4 in, 4 in/4 out	4 in, 4 in/4 out, 4 in/3 out, 2 in/2 out	4 in, 4 in/4 out	4 in, 4 in/4 out, 4 in/3 out	4 in, 4 in/2 out, 4 in/4 out	4 in/4 out	4 in, 2 in, 2 out	2 in/2 out, 4 out	4 in/2 out
Input Type	2-, 3-, 4-wire, dry contact	2-, 3-, 4-wire, dry contact	2-, 3-, 4-wire, dry contact	2-, 3-, 4-wire, dry contact	2-, 3-wire, dry contact	2-, 3-, 4-wire, dry contact	2-, 3-wire, dry contact	2-, 3-, 4-wire, dry contact	2-, 3-, 4-wire	LEDs, pushbuttons	2-, 3-, 4-wire, dry contact
Input Power Supplied By	AS-Interface/aux.	AS-Interface/aux.	AS-Interface	AS-Interface	AS-Interface	AS-Interface/ext.	AS-Interface/aux.	AS-Interface	AS-Interface/aux.	AS-Interface	AS-Interface
Sensor Type	PNP	PNP	PNP	PNP	PNP	PNP/NPN	PNP	PNP	4-20 mA, 0-10 V or PT100	Pushbuttons	PNP
Output Power	AS-Interface/aux.	Auxiliary	Auxiliary	Auxiliary	Auxiliary	AS-Interface/aux.	Auxiliary	AS-Interface	AS-Interface/aux.	AS-Interface/aux.	AS-Interface/aux.
Output Type	DC	DC	DC	DC	DC	DC, Relay	DC	DC	4-20 mA or 0-10 V	LEDs	Pneumatic
Approvals	 	 	 	 	 	  Class 1 Div 2, groups A,B, C, D	 	 	 	 	
Protection	IP67	IP67	IP69K	IP65, IP67	IP69K	IP20	IP20	IP20	IP20, IP67	IP67	IP65
I/O Connection Method	Micro	Micro (SPEEDCON compatible)	Micro	Spring terminals	Nano	Keyed, removable colored terminals	Keyed, removable colored terminals	Removable terminals	Terminals		Micro, 8 mm air



Other I/O modules:



Drive Control Module
Controls one SEW-EURODRIVE MOVIMOT® multispeed drive with softstart.

Accessories



Flat Cable Splitters
Connects or splits two pieces of flat cable, 6 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 Programmer
A must for every network. Can set AS-i addresses, read inputs and set outputs of a single AS-i node. New 3.0 versions are now available and in stock.

Want more information?
Simply go to: www.sensing.net/as-interface

RFID, Imagers, and Scanners

Automating manufacturing processes, preventing vehicle collisions and product counterfeiting, measuring positions, tracking work in progress, error proofing, and improving the supply chain—Pepperl+Fuchs RFID systems, and our high performance optical imagers, and scanners are a world wide standard in factory automation applications. These systems effectively expand the concept of item sensing, reporting presence and identity, allowing you to design a more efficient process.

Our extensive product portfolio includes:

- Handheld and stationary bar code imagers and scanners for detection of linear bar codes or 2D-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



Everything you need to know about identification systems . . .

Detailed product information is available in the *Identification Systems Catalog*, a thorough review of our family of identification systems. Comprehensive product specifications, electrical and dimensional drawings, and accessories are presented in a useful and easy-to-read format.

In addition to presenting our product portfolio, this publication discusses the fundamentals of RFID: the system components, the advantages of various frequency ranges and tags, choosing the correct system for your application, and mounting options.

This catalog also provides information about our barcode imaging systems. More than just a catalog of part numbers, it contains detailed information on our handheld and fixed-mount stationary and high-speed imagers. Data Matrix and common 1- & 2-D barcodes and symbologies are discussed in depth. It provides “barcode basics” and explains the operating principles to enable accurate data tracking that will improve your bottom line.



RFID

RFID has become indispensable for a variety of automated data collection and identification applications. At the heart of our RFID technology is our IDENT

Control System, a full product family that includes:

- Ethernet, serial, or DeviceNet interfaces
- A large selection of read/write heads
- Data tags for just about any application & environment

RFID tags can be read or written to at distances of up to several feet, while in motion, in any orientation, through intervening objects, and without the need for line of sight.



Barcode Imagers

Barcode imagers read codes via an integrated imaging (camera) system and store the codes as a static image, making extensive analysis of the image

possible. Our 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., RS-232, USB, Ethernet, etc. Codes can be read from any orientation, even if significantly distorted or damaged.

- Handheld & fixed mount versions
- Decode speeds up to 60 symbols/s
- Reads stationary or moving barcode



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.

With no post processing, laser scanners read only linear and stacked 1-D codes. Unlike RFID technology, in order to scan and evaluate barcodes with a laser scanner, line-of-sight is necessary.



High-Temperature Identification System

In certain manufacturing operations, high temperatures are encountered in situations such as, drying, hardening

of adhesives and painting operations. Barcode labels or RFID tags must withstand alternating cycles of up to several hundred degrees. 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

Developments in RFID technology continue to yield larger memory capacities, wider reading range, 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 between the technologies:

	Laser Scanner	2D Imager	High-Temp ID	RFID (HF)
Implementation Cost	Lowest	Low	Highest	High
Temperature	500 °F	500 °F	932 °F	392 °F
Working Range	24" (600 mm)	12" (300 mm)	18" (450 mm)	6" (150 mm)
Data Capacity	20 bytes	1.5 kbytes	6 bytes	2 kbytes
Encryption	No	Yes	No	Yes
Media Cost	1¢	1¢	\$50	\$1-\$10
Read/Write Media	No	No	No	Yes
Reading Speed	10/s	60/s	1/s	50/s
Passing Speed	6 ft/s	65 ft/s	1 ft/s	20 ft/s

Want more information?

Simply go to: www.sensing.net/rfid • www.sensing.net/barcode

Pepperl+Fuchs IDENT Control

IDENT Control is the most innovative unified RFID solution that offers outstanding functionality and features needed to solve demanding applications. 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 www.sensing.net/controllers

The first selection to make is the interface. Every read head available from Pepperl+Fuchs connects to these interfaces so the focus can be on the features and benefits of the individual interfaces themselves. 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	2 x M12 with built-in switch	RJ45 with optional IP67 shroud
EtherNet/IP	■	■
PROFINET	■	■
Modbus/TCP	■	■
TCP/IP, SMTP, HTTP	■	■
PROFIBUS	1 x M12	1 x M12, 2 x M12 or DSUB options
DPV0	■	■
DeviceNet		1 x 7/8" mini
Polled		■
Serial	2 x M12	1 x M12
ASCII	■	■
INTERBUS		2 x M23
Remote Bus		■
Housing Material	Metal, encapsulated	Metal
Mouting Options	Screw mount	Screw or DIN rail mount
IP rating	IP67	IP67

Read Heads and Tags

Pepperl+Fuchs read heads and tags are divided into four 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 Q, 13.56 MHz High Frequency (HF)

- Standard support for most HF 13.56 MHz, ISO 15693 tags
- High read/write speeds allow fast 10 ft/s conveyors
- Simultaneous read head operation as close as 80 mm
- 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



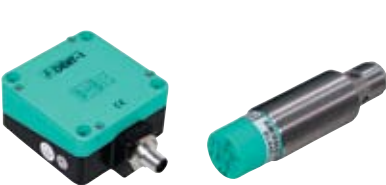
Series P, 125 kHz Low Frequency (LF)

- The widest selection of heads available with 7 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
- High temperature read only tags



Stand-alone Read Heads

Along with IDENT Control a wide selection of stand-alone read heads are available. These require no controller at all and can be connected directly to RS232, RS485 or Ethernet depending on model.



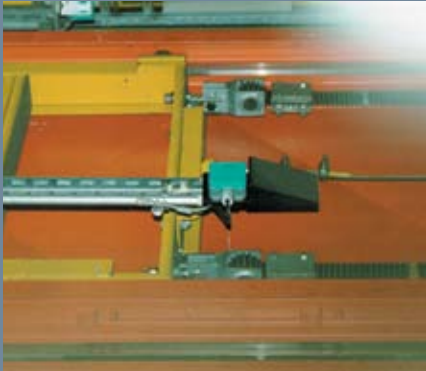
System Q



System MT



System P










Want more information?

Simply go to: www.sensing.net/rfid

Read Heads www.sensing.net/readers






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.


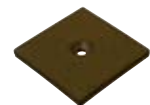




							
	18 mm	30 mm	Conveyor Reader	Limit Switch Style	Flat Pack	Large Plate Reader	F120/F180
Housing Material	PBT, SS	PBT, SS	ABS	PA-GF35, zinc	PBT, AL	PBT, SS	PC, PBT
IDENT Control	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	<div></div>	
Stand Alone	<div></div>				<div></div>		<div></div>

Tags www.sensing.net/tags

Surface Mount

These tags are designed to mount on any non-metallic material. They can also be mounted on metal if a spacer is also used. All tags have a read only fixed code that can be used for unique identification. Some 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.




Tag style							
Read Range	25 mm	18 mm	40 mm	60 mm	85 mm	70 mm	105 mm
Temperature	284 °F (140 °C)	266 °F (130 °C)	302 °F (150 °C)	185 °F (85 °C)	248 °F (120 °C)	302 °F (150 °C)	212 °F (100 °C)
R/W Memory (Bits)	1.25 k		1 k, 16 k	1 k, 16 k	.25 k, 2 k	8 k	1 k, 16 k
13.56 MHz (HF)	<div></div>		<div></div>	<div></div>	<div></div>	<div></div>	<div></div>
125 kHz (LF)		<div></div>	<div></div>	<div></div>			<div></div>

Tag style						
Read Range	130 mm	170 mm	108 mm	180 mm	157 mm	160 mm
Temperature	194 °F (90 °C)	392 °F (200 °C)	350 °F (177 °C)	158 °F (70 °C)	194 °F (90 °C)	185 °F (85 °C)
R/W Memory (Bits)	1 k, 16 k	1 k		.25 k, 1 k, 2 k, 8 k	1 k	2 k
13.56 MHz (HF)	<div></div>	<div></div>		<div></div>		<div></div>
125 kHz (LF)	<div></div>		<div></div>	<div></div>	<div></div>	

Tags www.sensing.net/tags

Surface Mount on Metal

These tags are capable of being mounted on any material including steel, aluminum, wood, or plastic. All tags have a read only fixed code that can be used for unique identification. Some also have read/write memory and those sizes are listed in the tables below.

Tag style			
	Conveyor	58 mm	C2
Read Range	56 mm	111 mm	6 m
Temperature	185 °F (85 °C)	248 °F (120 °C)	185 °F (85 °C)
R/W Memory (Bits)	1 k	1 k, 64 k	0.5 k
13.56 MHz (HF)	<div></div>	<div></div>	
125 kHz (LF)	<div></div>	<div></div>	
2.45 GHz (ISM)			<div></div>

Embeddable

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

Tag style					
	10 mm	12 mm	16 mm	24 mm	30 mm
Read Range	9 mm	12 mm	15 mm	24 mm	27 mm
Temperature	185 °F (85 °C)	185 °F (85 °C)	185 °F (85 °C)	185 °F (85 °C)	185 °F (85 °C)
R/W Memory (Bits)	16 k	1 k	1 k	1 k	1 k
125 kHz (LF)		<div></div>	<div></div>	<div></div>	<div></div>
13.56 MHz (HF)	<div></div>				

Handheld Programmiers

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

- Backlit display and key pad
- Standard software included, customizable using JavaScript SDK
- Bluetooth wireless up to 300 ft range









Want more information?

Simply go to: www.sensing.net/rfid

13.56 MHz (HF)	<div></div>
125 kHz (LF)	<div></div>





Barcode Imagers

	Fixed Mount Imagers			Handheld Imagers		
						
	MAC400/401	MAC423	MAC335	MAH120	MAH200	MAH300
Highlights	<ul style="list-style-type: none">• Highest speed reading on the market• Matchcode settable• Multicode versions available• Ethernet and RS232 output• 60 mm read distance	<ul style="list-style-type: none">• Ethernet output• IP65 protection for tough environments• Web page configuration for easy setup and storage of parameters• Matchcode available to entire or partial matching of barcodes	<ul style="list-style-type: none">• All common 1D & 2D codes• 3 readings/s• Omnidirectional reading• JavaScript programmable• 20 mm to 300 mm read distance depending on code type	<ul style="list-style-type: none">• Reads all popular 1D and 2D barcodes• Durable overmolded housing and secured cable ensure drop-shock survivability• Low-priced, wired only version	<ul style="list-style-type: none">• All common 1D & 2D codes• 3 readings/s, omnidirectional• Wireless, USB, PS/2, serial Interface	<ul style="list-style-type: none">• Keypad and display• All common 1D & 2D codes• 3 readings/s, omnidirectional• Wireless, USB, PS/2, serial Interface
1-D Barcode Symbolologies*	Codabar, Code 11, 39, 93, 128, Interleaved 2 of 5, Postal Symbolologies (4CB, Postnet, Planet,Australian, Royal, Japan, KIX,			Matrix 2 of 5, Micro QR, MSI Plessey, Pharmacode, NEC 2 of 5, Intelligent Mail), RSS (Limited, Expanded, Truncated, RSS14, Stacked), Telepen, Trioptic, UPC/EAN/JAN		
2-D Barcode Symbolologies*	Data Matrix (ECC200)			Aztec, Codablock F, Composite, Data Matrix (ECC200), PDF417, Pharmacode, QR Code,		
Reader Performance						
Field Size	30 mm x 20 mm	75 mm X 55 mm	200 mm x 160 mm	200 mm	200 mm	200 mm
Decoding Speed	60 symbols/s	60/30 symbols/s	3 symbols/s	3 symbols/s	3 symbols/s	3 symbols/s
Maximum Symbol Speed w/trigger	20 m/s	20 m/s datamatrix, 10m/s all other codes	Stationary reads only	Stationary reads only	Stationary reads only	Stationary reads only

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

Laser Barcode Readers

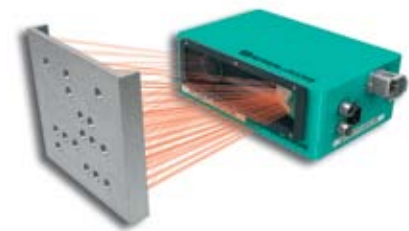
		
	VB14N-300	VB14N-600
Highlights	<ul style="list-style-type: none">• Medium range• Code reconstruction• Optional oscillating mirror	<ul style="list-style-type: none">• Long-range scanning• Code reconstruction• Optional oscillating mirror
Reading Range	50-300 mm	200-600 mm
Scan Rate	500-800 s ⁻¹	600-1000 s ⁻¹
Raster (-R versions)	18 mm @ 300 mm	24 mm @ 500 mm
Symbolologies	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

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 together using the ID-Net protocol. CBX versions for RS232, Ethernet/IP, and PROFIBUS are available from stock!

High-Temperature Imager



Pepperl+Fuchs offers robust industrial ID systems for a range of manufacturing environments and processes that are designed to be 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 codes of 1-6 digits). OITControl 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 optionally.
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

Want more information?
Simply go to: www.sensing.net/barcode

Industrial Vision Sensors

Pepperl+Fuchs vision sensors bridge the gap between standard photoelectric technology and costly machine vision systems with a more powerful and flexible solution. While traditional sensors merely detect the presence or absence of an object within their beam, vision sensors detect several attributes with a single device—information not uniformly distributed, such as the expiration date on a package, or the presence and verification of pills in a blister pack—and the part doesn't need to be positioned exactly the same way for each inspection. One vision sensor can replace multiple photoelectric sensors. Like all of our products, our vision sensors are designed to be dependable, flexible, and easy to integrate and use.



Want more information?
Simply go to: www.sensing.net/vision



Vision Sensor

Pepperl+Fuchs VOS312 vision sensor bridges the gap between standard photoelectric sensors and costly machine vision systems with a more powerful and flexible solution. While traditional sensors merely detect the presence or absence of an object within their beam, vision sensors detect several attributes with a single device—information not uniformly distributed, such as the expiration date on a package, or the presence and verification of pills in a blister pack—and the part doesn't need to be positioned exactly the same way for each inspection.

- Powerful, out-of-the-box use. No programming, just configure and go!
- Make multiple evaluations on a part at the same time
- Easy changeover using job management feature; inspection hardware remains the same
- Choose from six evaluation methods and store up to 16 jobs
- Ethernet and serial interfaces

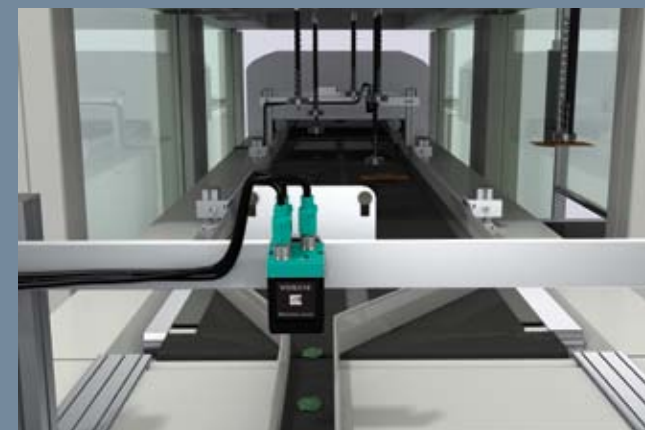


Rack Fine Positioning Sensor for ASRS

Unlike traditional retro-reflective solutions requiring reflectors mounted in precise locations, the VOS120-FFPL 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 VOS120-FFPL. FFPL vision sensors use drilled holes in the shelf cross-bar as the reference coordinates.

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





VOS312 Vision Sensor

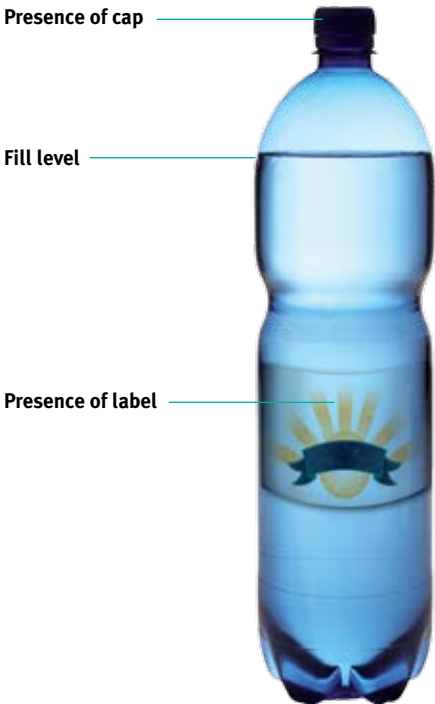
The VOS312 industrial vision sensor is packaged with a Graphical User Interface for easy installation and operation without programming language. Vision sensors are significantly more efficient and flexible than traditional vision solutions. For example, and they are distinctly simpler in design due to the pre-configured tool set, and thus less expensive and easier to implement than conventional industrial vision systems.

Typical tasks for vision sensors include checking for the presence of objects or patterns, position recognition for object orientation, or recognizing special shapes.



VOS312

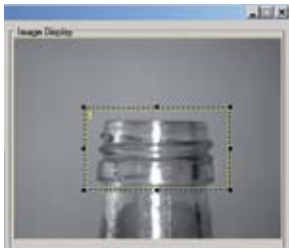
Feature Checks	6
Jobs	16
Sensing Distance	20 mm – 500 mm
Field of View	8 mm x 6 mm – 150 mm x 120 mm
Optical Resolution	12 µm/pixel – 240 µm/pixel
Light Source	Integrated, White light
Connection Interfaces	RS-422, Ethernet
Inputs	1 x 24 V, 1 x TRG optically isolated
Outputs	4 x 24 V, PNP optically isolated
Processing Time	40 ms – 500 ms
Protection (IEC)	IP65
Dimensions (H x W x L)	65 mm x 45 mm x 45 mm



The VOS312 verifies that the assembly has all of its parts present and that they are formed correctly.



Pass



Fail

An important error proofing task is part presence. A vision sensor can check multiple attributes so long as they all appear in the field of view. For instance presence of labels and caps on bottles in conjunction with level to determine if a bottle in a filling application is complete and ready for packaging.

Rack Fine Positioning System

The VOS120-FFPL fine rack positioning system has been developed for the precision 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.

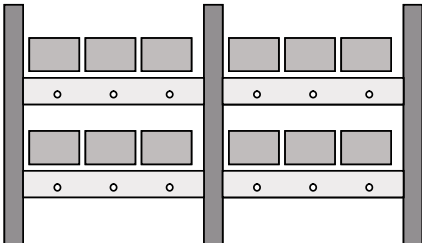
An automatic light exposure regulator is integrated in the sensor to compensate for the different reflection characteristics of the racking profiles.

The nominal position lies in the center of the capture area as the unit is calibrated and shipped from the factory. No additional calibration is required if the unit is mounted at faceplate working distance. The position is output via an RS-232 interface, which may be connected directly to a PLC. The values are output as ASCII data with polarity annotation to denote right or left of centerline. In addition to the serial output, the sensor provides the 4 digital outputs -X, +X, -Y and +Y. A square tolerance range is specified around the nominal position.

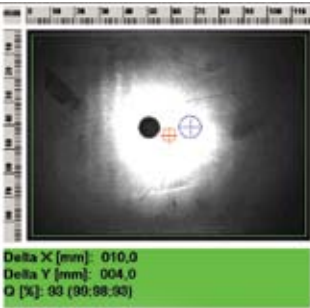


VOS120

Object Distance	200 or 300 mm
Object Size	Hole diameter 10-15 mm (10-15% of the capture range)
Illumination	Integrated IR
Capture Range Max.	100 mm x 120 mm
Operating Display	LED green: Ready for operation
Function Display	4 x LED red: +X, -X, +Y, -Y
Interface Type	serial , RS-232
Transfer Rate Max.	115.2 kbit/s
Weight	350 g



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 cross-bar as the reference coordinates.



Out-of-the-box, the VOS120-FFPL 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.

Want more information?
Simply go to: www.sensing.net/vision

PosiTrack Absolute Position Tracking System

PosiTrack absolute linear encoder systems use optic technology to provide fraction-of-a-millimeter position feedback in a diverse group of applications. Their versatile design and accessory packages make them a popular control option for:

- Automated Storage and Retrieval Systems
- Overhead Cranes
- Elevators and Lifts
- Galvanizing and Plating Processes
- Overhead Conveying and Materials Handling
- Positioning Stage and Studio Lighting
- Transfer Carriage and Pallet Identification

An Alternative to Rotary Encoders

Unlike traditional rotary encoders that depend on physical contact to convert circular motion to a PLC or drive-friendly signal, PosiTrack 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 - problems inherent to rotary devices - are eliminated.

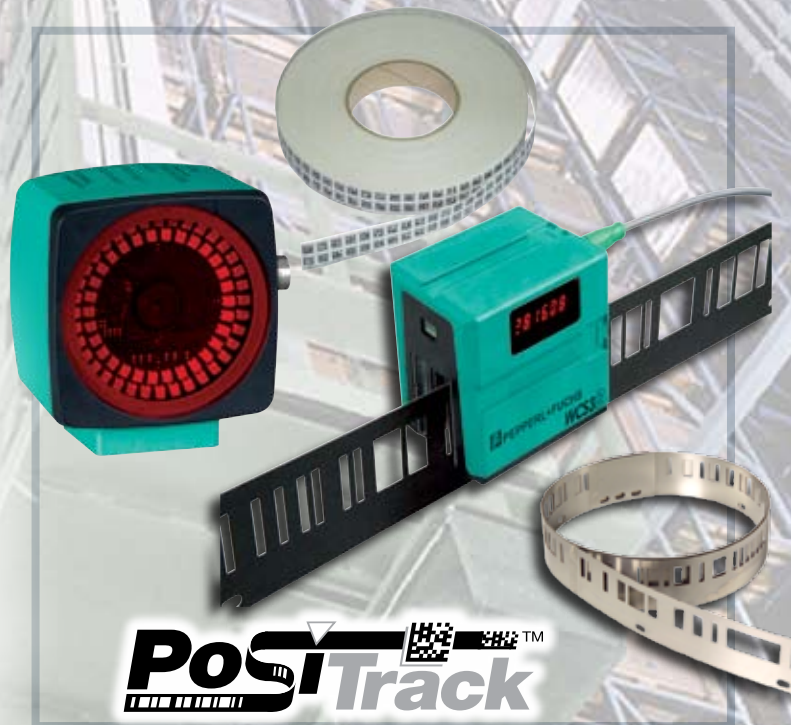
PosiTrack systems seamlessly emulate 512 turn, 1024 pulse per revolution encoders and communicate via industry standard control protocols such as RS-485, SSI, DeviceNet, PROFIBUS DP, Ethernet IP and parallel (binary or Gray code).

System Options – PosiTrack WCS and PosiTrack PCV

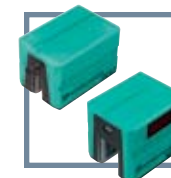
PosiTrack WCS uses a thru beam infrared LED array to scan a uniquely coded reference rail. It provides +/- 0.4 mm accuracy over travel distances to 1,030 feet.

PosiTrack PCV scans a custom data matrix-marked 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 1 ms.



PosiTrack WCS



WCS2B and WCS3B Read Heads

PosiTrack 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 very dirty environments such as galvanizing facilities, foundries, and steel mills.

The WCS3B PosiTrack 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. Features exclusive to the WCS3B include status LEDs for alignment and power indication, an optional "over speed" output, and an optional 7-segment display.



Mounting Accessories

A wide assortment of brackets and accessories are available to simplify the PosiTrack system installation. MH-series brackets snap-lock to quickly mount profile tracks. A wide assortment of MB-series angle brackets permit simple, inexpensive code rail mounting. Versions are also available for securing code rails to Unistrut or C-track.



Control Interfaces

If the PosiTrack read head's integral RS-485, SSI, or CANopen outputs don't suit your interface needs, there are several additional options. Control interfaces are available that convert the RS-485 signals to most standard network protocols including DeviceNet, PROFIBUS DP, EtherNet/IP, PROFINET, and Modbus RTU. In addition, RS-485-to-parallel converters and SSI controllers that enable extra-long cable runs are also available.



Code Rail

PosiTrack code rail is available in fiber-laminate or stainless steel and provides a unique positional code for 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 affect on the read head's accuracy. Fiber-laminate rails can also be flexed for vertical bends.

Want more information?

Simply go to: www.sensing.net/positrack



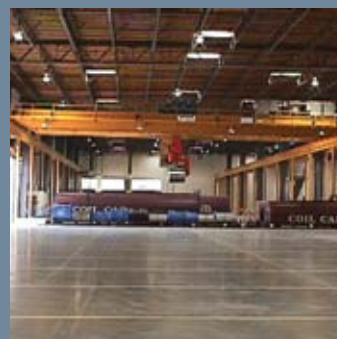
PosiTrack helps synchronize overhead and floor-based conveyors in chassis "marriage" systems.



PosiTrack provides precise, contact-free position and speed feedback in elevator and lifts.



PosiTrack's high accuracy is ideal for horizontal pick-and-place feedback in automated storage and retrieval systems.



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



PosiTrack's linear feedback ensures material handling system transfer cars allocate their pallets the correct conveyor.

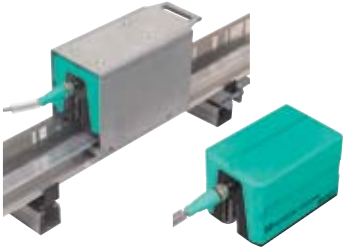



PosiTrack systems are ideal for positioning dip racks during anodizing and galvanizing processes.



PosiTrack provides continuous positional feedback of the car body throughout the assembly process.





Read Heads

		
	WCS2B	WCS3B
RS-485 to Network Interface (See below)	WCS2B-LS221	WCS3B-LS221
RS-485 to Parallel or SSI Interface (See below)	WCS2B-LS211	WCS3B-LS211
RS-485 Direct (19.2 kBaud)	WCS2B-LS246	WCS3B-LS246
SSI Direct - Binary	WCS2B-LS310	WCS3B-LS310
SSI Direct - Gray Code	WCS2B-LS311	WCS3B-LS311
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

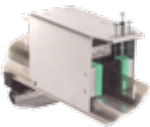






Network and Control Interfaces

				
WCS-DG210	WCS-EIG210	WCS-PG210E	WCS-IS310	WCS-IP110
DeviceNet	EtherNet/IP	PROFIBUS DP	SSI - binary	Parallel - binary

Code Rail

Fiber-Laminate		Stainless Steel	
			
WCS2-CS55-L1	WCS3-CS70-L1	WCS2-CS55-M1	WCS3-CS70-M1
The best choice for most applications, fiber-laminate code rails offer low cost, easy handling, and excellent durability.		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.	








WCS2B Track System Mounting

						
WCS2-GT09-P1	WCS2-PS1-8FT	WCS2-MH2-UNI	WCS2-MC1	WCS2-LB1	WCS-MF1	WCS2-FT1
WCS2B guide trolley	Track for guide trolley	Unistrut track mounting brackets	Track interconnect plates	Locking bracket	Compression tubing	Code rail installation tool

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


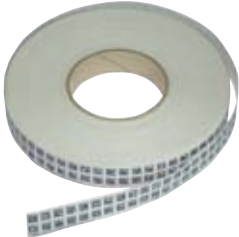






Angle Bracket Systems

Straight Code Rail Installations			Curved Code Rail Installations			
						
WCS-MB1	WCS-MB2	WCS-MB2-UNI	WCS-SP2	WCS-MB1-B	WCS-MB2-B	WCS-MB2-B-UNI
Angle bracket, thru-hole with mounting screws included	Angle bracket, w/nut for securing code rail to "C-track"	Angle bracket, w/nut for securing code rail to Unistrut	Grooved support track for curved laminate code rail sections	Angle bracket, thru-hole with mounting screws included	Angle bracket, w/nut for securing code rail to "C-track"	Angle bracket, w/nut for securing code rail to Unistrut

Want more information?
Simply go to: www.sensing.net/positrack



PosiTrack PCV

	Read Head	Code Tape	Serial Interface Adapter	Connectivity Options		Mounting Hardware		
								
Model	PCV80-F200-R4-V19	PCV**M-CA20-0 ** =Tape length (meters)	PCV-USB-RS485-Converter	V19-G-**M-PUR-ABG ** = Length (meters)	V19-G-ABG-PG9-FE	WCS-DCS	PCV-AB	PCV-FP
Highlights	2-D camera technology	Data matrix code tape	Converts RS-485 to RS-232	Molded M12 female cordset (8-pin)	8-pin, M12 female connector	6-conductor data cable	Right angle bracket for PCV80 read heads	Flat, surface-mount bracket for PCV80 read heads
	RS-485 communication (binary coded output)	Custom ordered in meter lengths (6 mile maximum continuous length)	Power supply included	2-, 5-, and 20-meter models available from stock	Attach your own preferred cable	26 AWG (5.8 mm O.D.)	Vertical and pivotal adjustment slots	Secures PCV80 reader to any flat surface
	12.5 m/s (41 ft/s) maximum speed	10 m, 20 m, 50 m, and 100 m reels available from stock	Plugs into USB port	For connection to PCV80 reader head	Contains grounding clamp	Must be ordered in foot increments	Stainless steel	Stainless steel
	80 mm scan distance +/- 15mm	Self-adhesive, for fast installation	Allows easy interface with PosiTrack PCV configuration software	Polyurethane jacket	Accepts cable diameters from 5 mm to 8 mm	PVC jacket	M6 mounting screws included (2)	M6 mounting screws included (4)
	1 ms response time	Suitable for -40 °C to +150 °C ambient conditions		Braided shielded				
	3 PNP switching outputs	Chemically resistant polyester laminate						
	Pushbutton or software configurable	Narrow, 25 mm height						
		Replacement sections can be generated from a standard home/office printer						

Want more information?
Simply go to: www.sensing.net/positrack

Machine Safety Sensors and Controls

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



NEW! SLCS/SLCT Light Curtains

High resolution, ultra-slim profile safety light curtains are the ideal solution for the most challenging machine safety applications. Higher resolution (smaller beam spacing) reduces the safety mounting distance with respect to the point-of-operation hazard, while the extremely small footprint (only 20 mm wide by 30 mm deep!) offers unsurpassed mounting flexibility.

The SLCS (Type 4) and SLCT (Type 2) series safety light curtains feature completely integrated control electronics and solid-state OSSDs – no separate control module is needed, simplifying wiring and setup! With a maximum range of 8 m (26 feet), SLCS and SLCT safety light curtains are available with beam spacings of 14, 30, 60, and 90 mm.

SLC14 / SLC30 Light Curtains – Finger and Hand Detection

These self-contained, 2-piece, Type 4 systems offer resolutions of 14 and 30 mm, protected heights to 1800 mm, and operating ranges to 15 m for 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, available in 2-, 3-, or 4-beam versions, with an operating range to 20 m. Classified Type 4 according to IEC 61496-1 and -2, they are suitable for Category 4 applications per EN 954-1. 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 3-piece solution for long range or perimeter detection. Available versions include a very cost-effective system of an integrated transmitter / receiver lightbar partnered with a passive mirror, to 2-, 3-, or 4-beam configurations with operating ranges to 65 m!

SLP Safety Light Grids are used together with the SafeBox Controller to form a Type 4 (according to IEC 61496-1, -2), suitable for Category 4 applications per EN-954-1.

SLA Series – Single Beam Safety Sensors



SLA Series Single Beam Safety Sensors are workhorses on the factory floor. Versions with compact, die-cast housings can fit into tight spaces. Other versions with operating ranges to 65 m can easily be used to safeguard along conveyors and around larger machinery. Used together with the SafeBox Controller, all are approved to Type 4 (according to IEC 61496-1, -2) and suitable for Category 4 applications per EN-954-1.

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 Category 4 per EN 954-1. 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).

Ergonomic Safety Palm Buttons & 2-Hand Controls

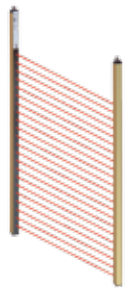

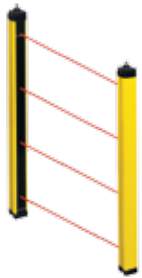
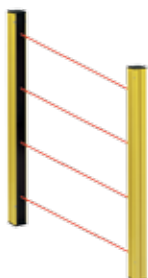




Pepperl+Fuchs palm buttons offer the industry's best combination of ergonomics and safety. Designed for use with standard two-hand machine controls, safety palm buttons eliminate the possibility of false actuation due to RFI. They require only a light touch to activate but can sense an operator's hands through gloves. When connected according to NFPA and ANSI standards to an approved two-hand control device, our ergonomic palm buttons guarantee operator-exclusive machine actuation.

Want more information?

Simply go to: www.sensing.net/machinesafety

Machine Safety Sensors

	 SLCS/SLCT Series Light Curtains	 SLC Series Light Curtains	 SLC-2, -3, -4 Light Grids	 SLP Series Light Grids	 SLA12 Series Sensors	 SLA29 Series Sensors
Highlights	<ul style="list-style-type: none">Ultra-slim profile (only 20 x 30 mm) for unsurpassed mounting flexibility14 mm (finger detection), 30 mm (hand detection), 60 mm, or 90 mm resolutionsInnovative mounting accessoriesSelectable startup/reset interlock, beam coding, external relay monitor	<ul style="list-style-type: none">14 mm resolution for finger detection or 30 mm resolution for hand detection in point-of-operation safeguarding applicationsLightbar diagnostics for pre-fault indication, status/fault codesSelectable startup/restart interlockBeam coding prevents crosstalk	<ul style="list-style-type: none">2-, 3-, 4-beams for body detection in entry and perimeter access applicationsLightbar diagnostics for pre-fault indication, status/fault codesSelectable startup/restart interlockBeam coding prevents crosstalk	<ul style="list-style-type: none">2-, 3-, 4-beams for body detection in entry and perimeter access applicationsLong range (to 65 m) for workcell perimeters & along conveyorsUses SafeBox controller to form a complete safety system	<ul style="list-style-type: none">Rugged die-cast metal housingCompact size fits in tight spacesAlignment aids and “signal reserve” indication on receiverRotatable connector or fixed cable for mounting flexibilityUses SafeBox controller to form a complete safety system	<ul style="list-style-type: none">Long range (65 m) for workcell perimeters & along conveyorsVisible red light for simple installation and alignmentAlignment aid and “signal reserve” indication on receiverUses SafeBox controller to form a complete safety system
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	0.2-65 m	0.2-10 m	0.2-65 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	500, 800, 900 mm	n/a	n/a
Approvals and Certifications	TÜV, CUL, CE	TÜV, CUL, CE	TÜV, CUL, CE	TÜV, CUL, CE	TÜV, CUL, CE	TÜV, CUL, CE
Safety Type accord to IEC61496	SLCT: Type 2, SLCS: Type 4	Type 4	Type 4	Type 4 (with SafeBox controller)	Type 4 (with SafeBox controller)	Type 4 (with SafeBox controller)
Emitter Element	Modulated infrared LED	Modulated infrared LED (880 nm)	Modulated infrared LED (880 nm)	Modulated visible red LED (665 nm)	Modulated visible red LED (660 nm)	Modulated visible red LED (660 nm)
Aperture Angle	± 2.5°, per IEC61496	± 2.5°, per IEC61496	± 2.5°, per IEC61496	± 2.5°, per IEC61496	± 2.5°, per IEC61496	± 2.5°, per IEC61496
Enclosure Protection Rating	IP65	IP67	IP67	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	Aluminum extrusion, RAL1021 (yellow) coated	Frame: zinc, pressure die-cast Sides: plastic	ABS plastic, RLA1021 (yellow)
Optical Face	Clear polycarbonate	Plastic; optional protective glass available	Plastic; optional protective glass available	Plastic; optional protective glass available	Plastic	Plastic
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	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)
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	Internal wiring chamber/terminal strip	Micro connector, rotatable by 90°, or 2.5 cm fixed cable	Micro connector or terminal compartment
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)	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)

Typical Applications:

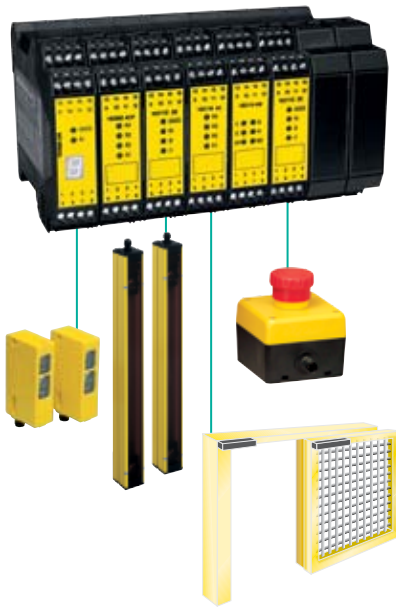
- Point-of-operation safeguarding on load/unload stations for assembly machines, metalforming equipment, and automotive body welding fixtures
- Perimeter and access safeguarding for robotic assembly workcells
- Access protection around conveyors and material handling equipment

SafeBox Safety Controller

The SafeBox Safety Controller’s DIN rail-mounted housing is available in sizes that accommodate 2 to 8 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 4 inputs
- 4C, 4X, 6C: 4- or 6-channel input modules
- 4M: Muting module
- 2E: E-stop module
- Blank covers for spare slots



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 2 e-stop inputs	SB4-OR-4CP-2E
8-channel safety controller	SB4-OR-4CP-4C

Want more information?
Simply go to: www.sensing.net/machinesafety

Cordsets

Pepperl+Fuchs offers a complete line of nano-, micro-, and mini-style cordsets in straight or right-angled versions. Nano and micro DC versions are available with LEDs. A wide variety of jacket materials survive hazards such as aggressive chemicals, weld slag, and wet and oily environments. Anti-vibration coupling nuts, a special strain relief, and O-ring seals guarantee a lifetime of reliable operation.

When electrical noise is a problem, a shielded cordset is the answer. Our micro cordsets are available with a braided shield to protect sensor signals from outside interference. The shield also provides additional rigidity for applications that are physically tough on cables. Shielded cordsets are perfect for true output signals in industrial environments.



Micro DC cordsets (M12)

- PVC, PUR
- 4-, 5-, & 8-pin
- 18 & 22 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

Nano cordsets (M8)

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

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
- Meets SAE specifications

Special Cordsets (M12)

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



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.

Pepperl+Fuchs Insulation Displacement and terminal connection style connectors can terminate a wide range of wire gauges, providing an efficient, tight, and reliable connection.



Junction Blocks

Multi-port 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 Pepperl+Fuchs 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.



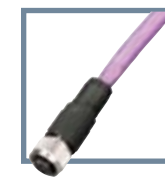
M12 and M8 DC Cordsets

A comprehensive range of M12 and M8 DC cordsets is available in a variety of cable types, including PVC, PUR, and irradiated PUR in gray or yellow. Standard lengths range from two to ten meters, and many custom lengths are available.



Specialty Cable for Sensors in Welding Environments

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



Communication Cables

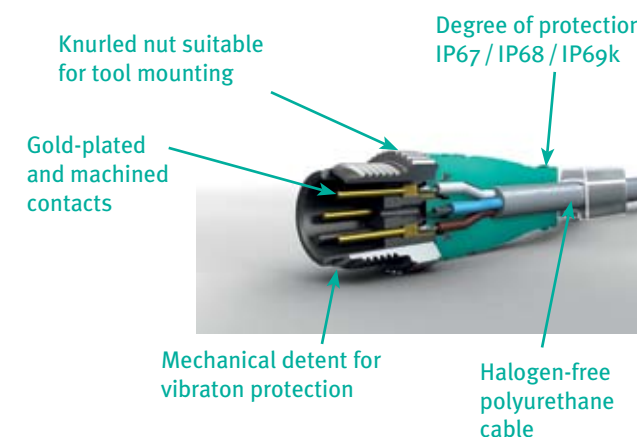
Communication cables for PROFIBUS and Ethernet connectors compliment our line of absolute encoders offering industrial network solutions.



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 tightened
- Integrated vibration protection

Want more information?

Simply go to: www.sensing.net/cordset

Basic Cable Connectors Nomenclature

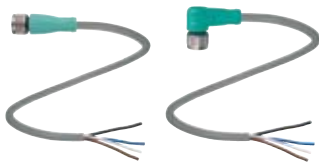


Our standard line of cables and cordstes includes cables that connect to various types of sensors and receptacles. These connection interface styles include inductry-standard connectors Micro DC M12 style, Nano DC M8 style , Micro AC 1/2" style, as well as the MINI AC 7/8" connector types. See below our standard nomenclature prefix coding for the various types of possible connectin devices. Standard lengths include 2, 5, and 10 meter, as well as many other nonstandard lengths.

Connectors	M12	M8	1/2" connector	7/8" connector
2-pin	V1-G-N			
3-pin	V11	V3	V12	V93
4-pin	V1, V1-G-N4	V31	V124	V94
5-pin	V15		V125	V95
8-pin	V17, V19			

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

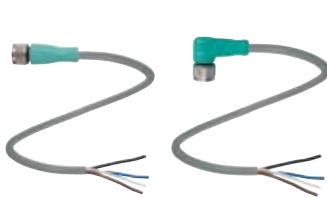


M12 Cables and Connectors

Cables are available in many types and style for connecting proximity sensors to machine control automation systems. These cables are available, depending upon the application, as single-ended 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.

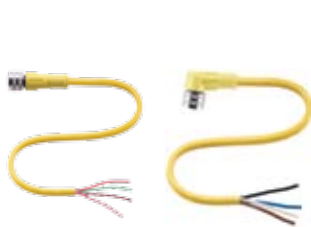


			
	Single-Ended Sensor Cables	Dual-Ended Extension Cables	NAMUR Single-Ended Cables
Type	M12	M12	M12
Series	V11, V1, V15, V17, V19	V11, V1, V15, V17, V19	V1-G-N, V1-G-N4
Conductors	3, 4, 5, 7, 8	3, 4, 5, 8	2, 4,
Cable Type	PVC, PUR, IRR PUR, POC	PVC, PUR, IRR PUR, POC	PUR
Shielded Models	V15-... ABG, V19-...ABG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

Available with stainless steel coupling nuts.

M8 Cables and Connectors

			
	Single-Ended Sensor Cables	Dual-Ended Extension Cables	Snap Lock - Female Cables
Type	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	





Micro & Mini AC

			
	Single-Ended Sensor Cables	Dual-Ended Extension Cables	Single-Ended 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, IRR PUR	PVC, IRR PUR	PVC
Cable Colors	Yellow	Yellow	Yellow





Want more information?
Simply go to: www.sensing.net/cordset

Field Attachables

Field attachable connetors are available for many cable styles and many mating connector applications. While many styles utilize 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 application specific cable lengths onsite.





				
Series	M12	M12	M8	M8
Models	V1, V15, V17, V19	V1	V3, V31	V3, V31
Style	Female/Male	Female/Male	Female/Male	Female/Male
Conductors	4, 5, 8	4	3, 4	3, 4
Connection Type	Screw teminal	Insulation displacement	Screw/Solder connection	Insulation displacement
Shielded Models	Yes	No	No	No

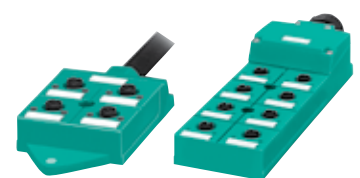
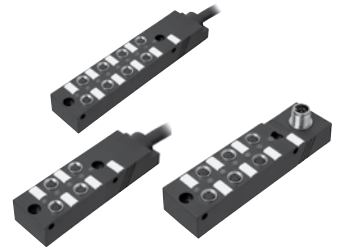
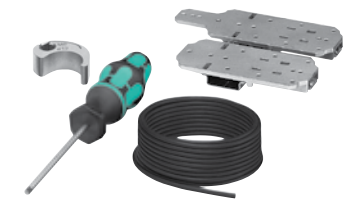
Panel Receptacles

				
Series	M12	M8	1/2" Micro AC	7/8" Mini AC
Models	V1, V15, V19	V3, V31	V12, V124, V125	V93, V94, V95
Style	Female/Male	Female/Male	Female/Male connectors	Female/Male
Pin Count	4, 5, 8	3, 4	3, 4, 5	3, 4, 5
Mounting	Front panel	Front panel	Front panel	Front panel
Mounting Thread	1/2" NPT		1/2" NPT	1/2" NPT

Junction Blocks and Accessories

Sensor I/O junction blocks offer many advantages in consolidating the sesnor 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 fuctionality and indicate machine operation status. See our complete line of I/O junction blocks as well as many useful accessories to make multi-sensor installation and wiring a snap.

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

			
Series	M12	M8	Tools, plugs, labels
Ports/Inputs	4/4, 4/8, 8/8, 8/16	4/4, 6/6, 8/8	Cable & mounting base
Connection	PUR cable, terminals, M23	PUR cable, M23, M12	
Sensor Input Type	PNP	PNP	

Want more information?
Simply go to: www.sensing.net/cordset

Splitters



Series	T-Splitters	Y-Splitters	Y-Splitters	Y-Splitters
Type	V1, V15	V1	V3	V1, V3
Connectors	M12	M12	M12, M18	M12, M18

Specialty Cables



Series	Ethernet	PROFIBUS	DeviceNet/CANopen	Valve cables & plugs
Style	V1SD	V15B, V15SD	V15-CAN	DIN A Type
Types	M12 to M12	M12 to M12	M12 to M12	DIN B Type
	M12 to RJ45			DIN C Type
	RJ45 to RJ45			Leaded, M12
	Field attachables (D-Coded)	Field attachables (D-Coded)	Field attachables (A-Coded)	Field attachables

Valve Connection Cables

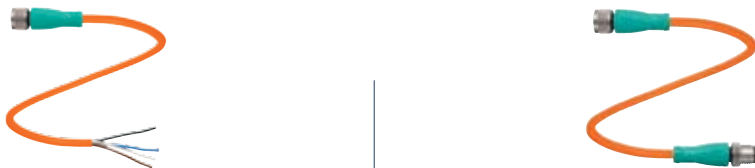
Pepperl+Fuchs offers a complete line of valve connection cables and field attachable valve connectors available in all standard Type A, B, C, BI, and CI models. The cables come as prelead or with integral M12 style straight or right-angled connector. The valve plug heads are also available with supression circuits and LEDS as standard feed through cables to meet your application requiements.



Series	A Type	B Type	BI Type	C Type	CI Type
Models	VMA	VMC	VMCI	VMC	VMCI
Contact Spacing	18 mm	10 mm	11 mm	8 mm	9.4 mm

Automotive

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



	Single-Ended Sensor Cables	Dual-Ended Extension Cables
Series	M12	M12
Models	V1	V1
Conductors	4	4
Cable Type	IRR PUR ¹ , POC ² <small>1) Irradiated PUR is the standard for most welding sensor connection applications 2) Cables for extreme environments, high temperature cable</small>	IRR PUR ¹ , POC ² <small>1) Irradiated PUR is the standard for most welding sensor connection applications 2) Cables for extreme environments, high temperature cable</small>
Cable Colors	Yellow, orange	Yellow, orange

Want more information?
Simply go to: www.sensing.net/cordset