

2009 QUICK SELECT PRODUCT GUIDE

- Capacitive Sensors**
- Inductive Sensors**
- Photoelectric Sensors**
- Ultrasonic Sensors**
- Rotary Encoders**
- AS-Interface**
- RFID & Barcode Systems**
- Industrial Vision Sensors**
- PosiTrack System**
- Machine Safety**
- Cordsets**



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 product technologies. Inside, you'll find 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.com.



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.



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











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!

2009 QUICK SELECT PRODUCT GUIDE

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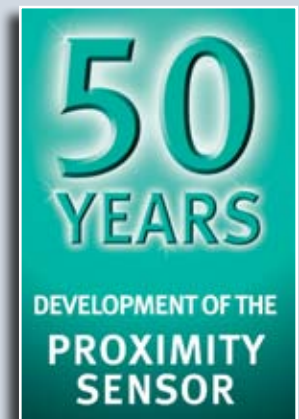
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50+ Years of Pioneering Work and Continuous Innovation...

In 1958—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 current circuit 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.





Value

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

Unparalleled Service

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

Quality

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

Expanded Product Lines

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

US-Based Engineering

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

Global Support

We are located in over 80 major cities on 6 continents. We're there when you need us, in the field or over the phone.

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.

Worldwide Manufacturing

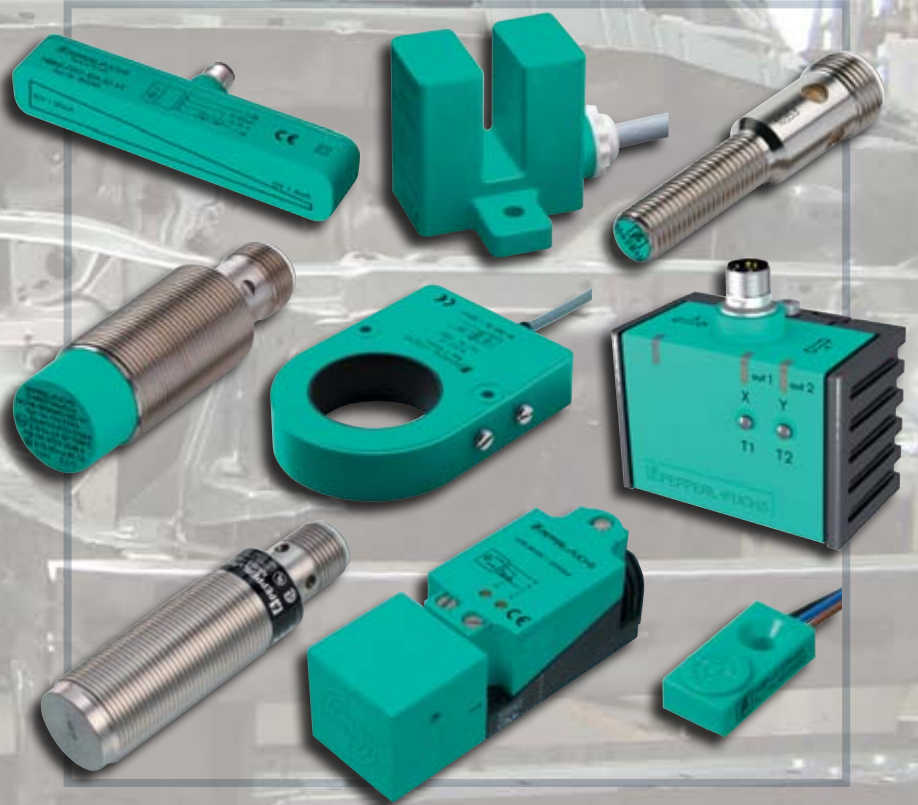
Locations are selected for their expertise and outstanding business practices. They supply high-quality parts precisely manufactured to global standards.

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.



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.



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.



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°.



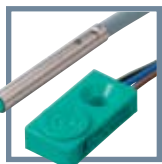
X-Series

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.



Position Measurement Sensors

Our PMI series of inductive positioning measurement devices are offered in measurement lengths that range from just a few millimeters to over 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.



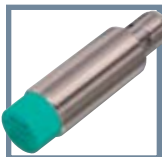
Half Pint Subminiature DC Inductive Sensors

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. Look for the Half Pint logo on our product data sheets.



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.



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.



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?

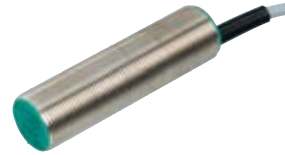
Simply go to: www.sensing.net/capacitive • www.sensing.net/inductive

Capacitive Proximity Sensors

Cylindrical & Surface Mount



12 mm Diameter



18 mm Diameter



30 mm Diameter

Highlights	12 mm Diameter	18 mm Diameter	30 mm Diameter
	<ul style="list-style-type: none"> Adjustable sensing range Plastic or metal housing Shielded or unshielded models 	<ul style="list-style-type: none"> Adjustable sensing range Shielded version Plastic or metal housing 	<ul style="list-style-type: none"> Adjustable sensing range Plastic or metal housing Shielded or unshielded models
Sensing Range	1-4 mm	1-8 mm	1-20 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

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.



F64

- Small housing
- High sensing range
- LED indication

8, 12, 15 mm



Cabled



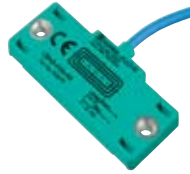
**50 mm Diameter
Ultra Slim**

- Adjustable sensing range
- Integral coding switches configure NPN/PNP and N.O./N.C.

1-30 mm



Cabled



**F46
Ultra Slim**

- Fixed range
- Surface or tie-wrap mounting
- Plastic housing
- NPN, PNP models

2, 5, 10 mm



Cabled



**Limit
Switch**

- Adjustable sensing range
- Limit switch-style housing
- Shielded model

1-30 mm



Terminal connection



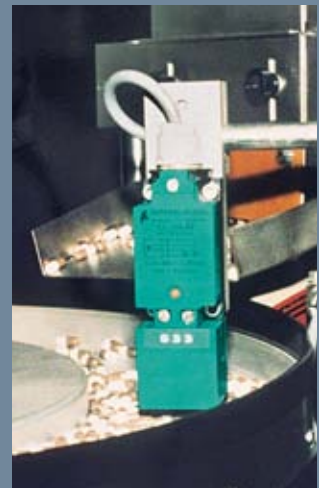
FP

- Adjustable sensing range
- Longest sensing range
- Unshielded

5-50 mm



Terminal connection



Want more information?

Simply go to: www.sensing.net/capacitive

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SENSING YOUR NEEDS

Inductive Proximity Sensors

Cylindrical

					
	3 mm Diameter	4 mm Diameter	4.5 mm Diameter	5 mm Diameter	6.5 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
Sensing Range (Shielded)	0.6 mm	0.8 mm	0.8 mm	0.8, 1.5 mm	1.5, 2 mm
Sensing Range (Unshielded)					2, 3 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
Half Pint	■	■		■	■
AS-Interface Compatible					



Typical Applications:

- Robotics
- Conveyors
- Machine tools
- Counting
- Elevators



8 mm Diameter

- 4-way LED available
- Threaded barrel
- Shielded or unshielded models

11 mm Diameter

- Intrinsically safe
- Smooth plastic

12 mm Diameter

- Wide range of wiring options
- Shielded or unshielded models
- Reduction factor 1 models

14 mm Diameter

- Intrinsically safe
- Threaded metal barrel

18 mm Diameter

- Wide range of wiring options
- Shielded or unshielded models
- Reduction factor 1 models

30 mm Diameter

- Longer sensing range
- Shielded or unshielded models
- Relay output models
- Reduction factor 1 models

1.5, 2, 3, 4 mm

2 mm

2, 4, 6 mm

2, 3 mm

5, 8, 12 mm

8, 10, 15 mm

2, 3, 4, 6 mm

5 mm

4, 6, 8, 10 mm

5 mm

5, 8, 12, 14, 20 mm

15, 25, 40 mm



Cabled,
nano, micro

Cabled

Cabled,
micro

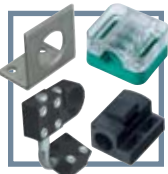
Cabled

Cabled,
micro, mini

Cabled,
micro, mini



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

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PEPPERL+FUCHS
SENSING YOUR NEEDS

Inductive Proximity Sensors

Surface Mount



F79



F41



F29

Highlights	F79	F41	F29
<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 • One screw mounting • Corner LED • 5-30 VDC operation 	
Sensing Range (Shielded)	1.5 mm	1.5 mm	2 mm
Sensing Range (Unshielded)	2 mm		4 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
Half Pint	■	■	■
AS-Interface Compatible			



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.



V3

- Miniature rectangular housing
- LED status

2, 3 mm



Cabled, nano, FASTON terminal



F1

- Fast switching
- LED status
- Stackable (shielded) models

2, 4 mm
8 mm



Cabled, nano



F33

- Flat rectangular plastic housing
- NPN and PNP models
- Die-cast zinc housing available (F33M)

5, 7 mm



Cabled



F104M

- Flat rectangular metal housing
- NPN and PNP models
- Dual LED indication
- Weld immune models available

5, 7 mm



Cabled, micro pigtail



F17

- Output status LED
- Thin housing
- 50 x 30 x 7 mm

10 mm



Cabled

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.



Counter/Timer/Rate Indicator

The KCN1-6SR-V and KCN1-6WR-V accept NPN/PNP

input pulses from external sensors and display count, time, or rate information. A 2-line LCD displays the count value and preset simultaneously.



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

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Inductive Proximity Sensors

Surface Mount
(continued)



F7/F10



RHINO™



Limit Switch

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 • Reduction factor 1 models 	<ul style="list-style-type: none"> • Limit switch-style housing • Metal base, 1/2" NPT
Sensing Range (Shielded)	7 mm	20 mm	15, 20 mm
Sensing Range (Unshielded)	5, 7, 10 mm	40 mm	30, 40 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
Half Pint			
AS-Interface Compatible		■	■





Flat Pack

- Flat pack housing
- Metal base, 1/2" NPT
- Corner edge LED

40, 50 mm

40, 50 mm



Micro, mini, terminal connection



F23

- Longest sensing range
- IP67
- Plastic housing, aluminum base

100 mm



Micro, mini



Slot Type

- 2-30 mm slot widths
- Highly accurate detection
- Greater than 1 kHz switching possible with NAMUR



Cabled



Ring Type

- 10-100 mm ring diameters
- Greater than 1 kHz switching possible with NAMUR

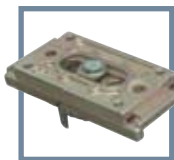


Cabled, micro

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



Pile Driver™



Weld Immune

GRIPDicator



Gripdicator™



Cylinder Switch



Inclination Sensors

Highlights	<ul style="list-style-type: none"> • "Wear-proof" stainless steel housing • 8, 12, and 18 mm diameter models • IP69K washdown rating 	<ul style="list-style-type: none"> • Reliable sensing within strong magnetic environments • Special coatings repel weld slag • Reduction factor 1 models 	<ul style="list-style-type: none"> • Dual sensor "satellites" for clamp and gripper position feedback • Weld field immunity • Multiple satellite styles and cable lengths 	<ul style="list-style-type: none"> • End-of-stroke verification in hydraulic and pneumatic • Operational pressure ratings to 3000 psi • Weld field immunity • 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
NAMUR (Intrinsically Safe)					
2-Wire DC	■	■			
3-Wire DC	■	■	■		■
4-Wire DC		■		■	
2-Wire AC		■			
4-Wire AC					
2-Wire AC/DC	■	■		■	
Relay Output					
Electrical Connection	Cabled, micro, mini	Terminal connection, micro, mini	Micro	Micro, mini	Cabled, micro
Half Pint	■				
AS-Interface Compatible		■			





Position Measurement

- 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



Sensors for Mobile Equipment

- -40 °F to +185 °F operational temperature
- Extended sensing range
- Heavy cable gauge
- Relay models available



Washdown Sensors

- 12, 18, and 30 mm diameter models
- Plastic housing
- Sealed cable
- High-pressure washdown rated, IP69K
- Sensing ranges from 2-15 mm



Extended Temperature

- Operational temperature ratings from -40 °F to +486 °F
- Cylindrical and surface mount housing styles
- Remote amplifier models



Explosion Proof

- UL approved for use in hazardous areas
- Solid-state components
- All-metal housings



High Pressure

- Pressure ratings to 7000 psi
- 12 mm diameter models
- 3-wire DC and NAMUR



Magnetic Sensors

- Capable of detection through aluminum
- Cylindrical and surface mount housings

<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 • Relay models available 	<ul style="list-style-type: none"> • 12, 18, and 30 mm diameter models • Plastic housing • Sealed cable • High-pressure washdown rated, IP69K • Sensing ranges from 2-15 mm 	<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 	<ul style="list-style-type: none"> • Capable of detection through aluminum • Cylindrical and surface mount housings
■	■	■	■	■	■	■
			■			
			■			
			■			
				■		
					■	
Cabled, micro	Cabled	Cabled	Cabled, micro, terminal connection	Cabled	Cabled	Cabled, micro

Typical Applications:

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

Accessories



Cushioned Mounting Bracket

These spring-loaded, surface-mount brackets absorb impact with

a block-shaped outer housing, an inner sleeve to secure the sensor, and a plastic protective cap for the sensor face.



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

Ultrasonic Sensors

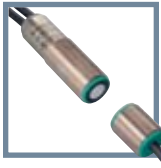
- Long-range detection of all solid, liquid and granular targets
- Sensing ranges to 6 m
- 12 mm, 18 mm, 30 mm diameter, as well as rectangular housings
- Multiplex and synchronize ability for multiple sensors
- Discrete or analog outputs
- Special models for sheet, splice, and label detection
- Teflon-coated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



The Leader in Double Sheet Detection Technology

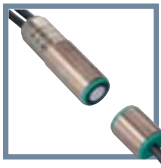
Pepperl+Fuchs continues to set the standard with our double sheet detection technology designed for a wide range of process applications. Our 18 mm diameter double sheet detectors are ultrasonic thru-beam sensors that are designed to identify misfeeds of a variety of media, including paper, cardboard, 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 that may be part of the material being detected. 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

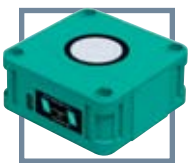
The newest version of our label detector is compact and high-speed. It is engineered to detect labels on a roll independent of color, printing or glossiness. High-speed applications are no problem for this sensor with its 600 µs response time. Separate outputs are available for the label and the label 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. The sensor 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

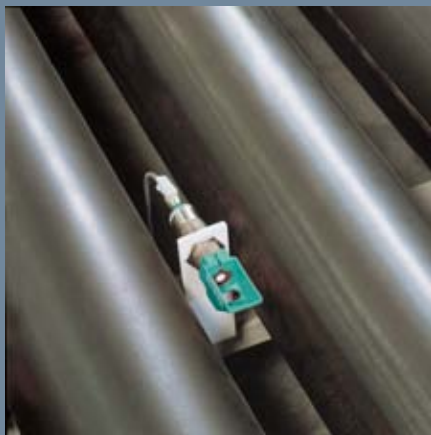


30 mm Diameter



30 mm Diameter AC

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
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
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



Typical Applications:

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



Remote Transducer

- Allows mounting in tight locations
- Dual independent transistor outputs
- 3 modes of operation

50 - 300 mm
120 mm - 1 m



Micro



Limit Switch

- DIP switch programmable
- Programmable filters provide exceptional output stability

300 mm - 6 m



Terminal connection



F42

- AC/DC, top or side sensing with relay output
- Pushbutton programming

50 - 500 mm
90 mm - 2 m
240 mm - 4 m
400 mm - 6 m



Micro, mini



Flat Pack

- Can be extended up to 9 m sensing range
- Dip switch programming
- Bright LEDs power and status

800 mm - 6 m



Terminal connection



F12

- Push/pull output
- 90° connector rotation
- High-visibility LEDs
- Teachable

50-800 mm



Micro



Double Sheet/Label/Splice Detection

- Outputs for single sheet, double sheet, and no sheet
- 18 mm and 30 mm diameter models

Separation
20 - 60 mm (18 mm)
50-150 mm (30 mm)



Cabled

Accessories



Right-Angled Deflector

By deflecting the ultrasonic beam 90° from the sensing

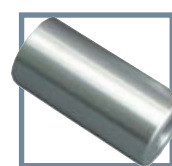
plane, right-angled deflectors allow low-profile mounting of 18 mm or 30 mm diameter ultrasonic sensors on tanks, conveyors, etc.



Mounting Wells

Mounting wells keep tanks sealed when the sensor is

removed. They are available in a 30 mm diameter durable Teflon® material that has a thru-hole for ultrasonic sensing.



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 1-1/4in. 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

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PEPPERL+FUCHS
SENSING YOUR NEEDS

Photoelectric Sensors

■ Photoelectric technologies

- Diffuse
 - Background suppression
 - Standard diffuse
 - Convergent
 - Background evaluation
- Retro-reflective
 - Polarized and standard retro-reflective
 - Foreground suppression
 - Clear object detection
- Thru-beam
- Fiber optic
 - Glass or plastic fiber cables
- Color
- Contrast
- Luminescence
- Collision avoidance
- Optical data couplers
- Light grids
- Laser displacement

■ 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 housings

■ Fully modular styles

■ 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





Econo-Vue™ Cylindrical Sensors

The new Econo-Vue 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, the Econo-Vue is priced to beat the competition.



Opti-Vue™ Photoelectric Sensors

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



Laser Displacement 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 retro-reflective 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.



Tru-Vue™

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



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.



SU18 Series

The new SU18 Series of fiber optic amplifiers offers 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-speed modes.



SU19 Series

Pepperl+Fuchs introduces its newest fiber optic amplifier, the 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 mutual interference protection, and the ability to detect clear objects.



Dura-Vue™ Contrast and Color Sensors

Rugged and compact, the Dura-Vue 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.

Want more information?

Simply go to: www.sensing.net/photoelectric

Photoelectric Sensors



KT9 Series



KT11 Series



GLV12 Series



**Econo-Vue™
GLV18 Series**



**Basic Series
18 mm**

Highlights	<ul style="list-style-type: none"> Alternative to fibers; wide beam angle 	<ul style="list-style-type: none"> Alternative to fibers; wide beam angle 	<ul style="list-style-type: none"> 12 mm dia. metal housing with sensitivity adjustment 	<ul style="list-style-type: none"> Most economical 18 mm dia. photoelectric; straight and right-angled housings 	<ul style="list-style-type: none"> Compact and cost-effective 18 mm dia. metal housing
Convergent Beam Mode					
Diffuse Mode with Background Suppression					
Diffuse Mode	50 mm	50 mm	200 mm	200, 400, 450 mm	200, 500 mm
Retro-Reflective Mode			1, 2 m	3.5, 4, 5.5, 6.5 m	4 m
Retro-Reflective Mode Clear Object Detection					
Retro-Reflective Mode with Foreground Suppression					
Thru-Beam Mode	250 mm	250 mm	5 m	12, 20 m	10 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
Light Source	Infrared	Infrared	Visible red	Visible red	Infrared, visible red, laser
Power Supply	DC	DC	DC	DC	DC
Output Type	NPN, PNP	NPN, PNP	NPN, PNP	NPN, PNP	NPN, PNP
Electrical Connection	Nano, cabled	Nano, cabled	Micro, cabled	Micro, cabled	Micro, 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



V18 Series

- Rugged metal 18 mm dia. family with straight and right-angled housings



Tru-View™

ML17 Series

- Compact, cost-effective industry-standard housing



MHP Series

- Rugged housing suitable for 1200 psi washdown



ML3 Series

- Ultra miniature housing; wide range of apertures



ML4.2 Series

- Best background suppression available in miniature housing



ML6 Series

- Superior background suppression for general-purpose use

		25, 63 mm	30 mm		
120 mm	50, 100 mm			20, 40, 60, 80 mm	20, 40, 60, 80, 120 mm
400 mm	450 mm	150, 450 mm			
3.5, 15 m	3.5, 6.5 m	2.4, 9.1 m		4 m	
60 m	20 m	30.4 m	1.5 m		
■	■	■			
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
Visible red, laser	Infrared, visible red	Infrared, visible red	Infrared, visible red	Infrared, visible red	Visible red
DC	DC	DC, AC	DC	DC	DC
4-in-1	4-in-1	NPN, PNP, thyristor	NPN, PNP	4-in-1	4-in-1
Micro	Micro, nano, cabled	Micro, cabled	Cabled	Nano, cabled	Nano, cabled

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 Tru-View ML17 series on conveyor sidewalls.

Want more information?

Simply go to: www.sensing.net/photoelectric

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Photoelectric Sensors

Continued



ML5 Series



ML7 Series



ML8 Series



ML20 Series



MLV11 Series

Highlights	<ul style="list-style-type: none"> • Small housing; switchable operating mode 	<ul style="list-style-type: none"> • Simple "teach in"; rated for severe washdown 	<ul style="list-style-type: none"> • Basic tamper-proof miniature housing 	<ul style="list-style-type: none"> • Long-range miniature housing 	<ul style="list-style-type: none"> • Enhanced features via OPUS software; adjustable connector
Convergent Beam Mode					
Diffuse Mode with Background Suppression		140, 350 mm	140, 350 mm		
Diffuse Mode with Background Evaluation					
Diffuse Mode	400 mm	200 mm	200 mm	100 mm (wide beam), 1 m	150, 300, 500 mm
Retro-Reflective Mode	1.5, 2 m	2.5 m	2.5 m	5 m	
Retro-Reflective Mode Clear Object Detection		3.5 m			
Retro-Reflective Mode with Foreground Suppression					
Thru-Beam Mode	5 m	3.5 m		15 m	
Fiber Adaptable					
Housing H x W x L (mm)	26 x 12 x 24	39 x 11 x 23	39 x 11 x 23	33 x 11 x 20	50 x 18 x 45
Light Source	Infrared, visible red	Infrared, visible red	Visible red	Infrared, visible red	Visible red, laser
Power Supply	DC	DC	DC	DC	DC
Output Type	NPN, PNP	4-in-1, NPN, PNP	NPN, PNP	NPN, PNP	NPN, PNP
Electrical Connection	Nano, cabled	Micro, nano, cabled	Micro, nano	Micro, cabled	Micro



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



MLV12 Series

- Rugged die-cast metal housing frame



MLV40 Series

- Rugged metal housing; wide range of models available



MLV41 Series

- Rugged metal housing with front and rear LEDs; powerful performance



Opti-Vue Series 31

- Color-coded front label to identify sensing mode



Series 23

- Sharp cut-off and long-range background suppression; integral timer options



Series 28

- Low operating temperature; highly visible LEDs; timer versions

			300 mm		
250 mm		350 mm		500 mm, 1, 2 m	400, 700 mm, 1.5, 2 m
150 mm					
	500 mm		1.2 m		
450 mm, 5, 15 m	1, 2 m		9, 12 m		12, 30 m
3 m		3 m			
					9 m
16 m	5 m		30 m		30, 65, 300 m
65 x 15 x 42	62 x 14 x 31	60 x 14 x 31	62 x 18 x 35	91 x 27 x 68	Varies
Infrared, visible red, laser	Infrared, visible red	Infrared, visible red	Visible red	Infrared, visible red	Infrared, visible red, laser
DC	DC	DC	AC/DC, DC	AC/DC, DC	AC/DC, AS-Interface, DC
4-in-1, NPN, PNP	NPN, PNP	4-in-1	4-in-1, Relay	NPN, PNP, relay	NPN, PNP, 4-in-1, relay, AS-Interface
Micro, cabled	Micro, cabled	Micro, nano, cabled	Micro, cabled	Micro, terminal connection	Micro, mini, cabled, terminal connection

Accessories



OMH-RL31-03

Protective shroud bracket with flexible mounting pattern for Opti-Vue series.



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 Dura-Vue, Series 28, and Series 29 models

featuring Black Armor™ coating and replaceable glass lens.

Want more information?

Simply go to: www.sensing.net/photoelectric

Photoelectric Sensors

Continued



Series 29



Series 39



M1K Series



MP Series

Highlights	<ul style="list-style-type: none"> • Cost-effective long-range series 	<ul style="list-style-type: none"> • Weak signal outputs available; timer versions 	<ul style="list-style-type: none"> • 25-position head, cross-talk protection 	<ul style="list-style-type: none"> • Modular design; harsh duty
Convergent Beam Mode				
Diffuse Mode with Background Suppression	1.2 m			
Diffuse Mode	2 m	800 mm, 2 m	300 mm	0.3, 0.45, 0.76, 0.9, 1.3, 1.8, 3 m
Retro-Reflective Mode	7, 12 m	7, 20 m	2 m	4.5, 6, 9 m
Retro-Reflective Mode Clear Object Detection				
Retro-Reflective Mode with Foreground Suppression	6 m			
Thru-Beam Mode		20 m		36, 60 m
Fiber Adaptable			■	■
Housing H x W x L (mm)	Varies	64 x 25 x 75	30 x 30 x 102	Varies
Light Source	Visible red	Infrared, visible red	Infrared, visible red	Infrared, visible red
Power Supply	AC/DC, DC	AC/DC, DC	DC	AC/DC, AC, DC
Output Type	4-in-1, relay	NPN, PNP, relay	NAMUR	NPN, PNP, thyristor, relay
Electrical Connection	Micro, cabled, terminal connection	Terminal connection	Terminal connection	Micro, mini, cabled, terminal connection



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



GL Series

- Full range of slot widths available



HPV Series

- Single or dual optical axis models



FE5V Series

- Ultraminiature, self-contained housing



FE8V Series

- Rugged, die-cast zinc housing



RAL Series

- One-piece slot light grid

10 - 220 mm

25 mm

10 mm

30 mm

50-150 mm

Varies

50 x 40 x 10

29 x 26 x 8

76 x 52 x 20

Varies

Visible red

Infrared

Infrared

Infrared

Infrared

DC

DC

DC

AC, DC

DC

PNP

NPN

NPN

NPN, PNP, thyristor

PNP

Nano

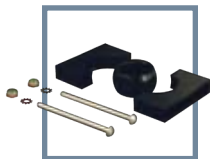
Cabled

Cabled

Cabled

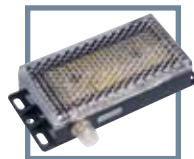
Nano

Accessories



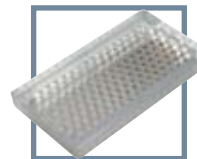
MPZBo6

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?

Simply go to: www.sensing.net/photoelectric

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PEPPERL+FUCHS
SENSING YOUR NEEDS

Photoelectric Sensors

Application Specific



SBL Series Conveyor Sensors



Contrast Sensors



Luminescence Sensors



Color Sensors



Light Grids

Highlights	<ul style="list-style-type: none"> Mounts between conveyor rollers Reliable detection of packages regardless of color Integral timer, cascadable, and pneumatic-valve versions available 	<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 that 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"> Easy alignment of thru-beam No remote amplifiers Wide array of housings and configurations
Classification	SBL-8-H	DK12 Dura-Vue™ DK10 potentiometer programmable, laser versions DK(E)20, DK(E)21 pushbutton programmable DK34, DK35 low contrast	RL-UV	DF20 single channel DF12 Dura-Vue™ three channels VCS110 five or ten channels VCS210 255 channels	PLVScan 300-3056 mm field height
Operating Range	900 mm	Varies	130 mm	Varies	4, 8 m
Housing H x W x L (mm)	Varies	Varies	86 x 36 x 63	Varies	Varies
Light Source	Infrared	Green, red, or blue LEDs, laser	Ultraviolet	White, red, green, blue LEDs	Infrared
Power Supply	DC	DC	DC	DC	DC
Output Type	NPN, PNP	4-in-1, analog	NPN, PNP, analog	NPN, PNP	PNP
Electrical Connection	Micro	Micro	Micro, cabled	Varies	Terminal housing



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



Low-Profile Light Grids

VDM18

VDM35

VDM70

EDM

Optical Data Couplers

Collision Avoidance

- Dense sensing field
- For elevator and doorway monitoring
- Automatic beam crossing configuration

- Short-range laser displacement sensor
- Diffuse mode
- Accuracy ± 0.5 mm

- Medium-range laser displacement sensor
- Diffuse and retro-reflective versions
- Accuracy ± 10 mm

- Long-range laser displacement sensor
- Diffuse and retro-reflective versions
- Accuracy ± 2 mm

- Long-range laser displacement sensor
- Retro-reflective mode
- Accuracy ± 1 mm

- Wireless data transfer over long distances
- Parallel and serial data transfer
- Replaces slip rings and drag cables

- Monitors 3 areas simultaneously in 1 housing
- 8 operating frequencies
- 3 adjustable sensing lobes

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

VDM18-100
VDM18-300

VDM35-6
VDM35-30

VDM70-10
VDM70-250

EDM50
EDM120
EDM240

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)

FE7W

3.5, 4 m

100, 300 mm

6, 30 m

10, 250 m

50, 120, 240 m

1.5 - 240 m

3 m

Varies

50 x 17 x 50

93 x 42 x 94

93 x 42 x 95

70 x 70 x 307

Varies

45 x 100 x 72

Infrared

Laser

Laser

Laser

Laser

Infrared, visible red

Infrared

DC

DC

DC

DC

DC

DC

DC

NPN, PNP

4-20 mA, PNP,
RS-485

4-20 mA, PNP

4-20 mA, PNP,
RS-422, SSI

Varies

Varies

NPN, PNP

Nano, cabled

Micro

Micro

12-pin connector

Terminal connection

Connectors, terminal
connection

Cabled

Accessories



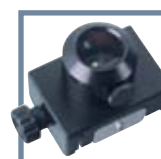
OMH-LS610-01

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



OMH-VDM35-01

Fine adjustment set allows precise adjustment of sensor when mounted on OMH-VDM35 bracket.



VDM35-AR

Alignment aid for VDM35 and VDM70 series allows viewing of visible laser at great distances.

Want more information?

Simply go to: www.sensing.net/photoelectric

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PEPPERL+FUCHS
SENSING YOUR NEEDS

Photoelectric Sensors

Fiber Optic Amplifiers



SU15 Series



SU16 Series



SU16 Analog Series



SU18 Series

Highlights	<ul style="list-style-type: none"> • PC-programmable; models for glass or plastic fibers 	<ul style="list-style-type: none"> • High power and high speed models 	<ul style="list-style-type: none"> • Analog output proportional to light intensity 	<ul style="list-style-type: none"> • Potentiometer or pushbutton adjustable
Indication	LEDs (3)	LEDs (2)	LEDs (2)	LEDs (2)
Sensitivity Adjustment/Teach	Pushbutton (2)	Potentiometer (1)	Potentiometer (2)	Potentiometer (1) or pushbutton (1)
Timer Function	On delay, off delay, 1-shot	Off delay		On delay, off delay
Switching Frequency	1.5 kHz	8 kHz	500 Hz	6 kHz
Fiber Adaptable	■	■	■	■
Housing H x W x L (mm)	36 x 12 x 59	28 x 10 x 60	28 x 10 x 60	28 x 9 x 55
Light Source	Visible red	Visible red	Visible red	Visible red
Power Supply	DC	DC	DC	DC
Output Type	NPN, PNP	NPN, PNP	1-5 VDC	4-in-1
Electrical Connection	Nano, cabled	Micro pigtail, cabled	Cabled	Nano 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.



SU17 Series

- Built-in auto teach; digital display

LEDs (2), 1-digit display

Pushbutton (1)

Off delay

1 kHz



35 x 10 x 60

Visible red

DC

NPN, PNP

Micro pigtail, cabled



SU19 Series

- 4-digit display, gang mountable, clear object detection

LEDs (2)

Pushbutton (4)

On delay, off delay, 1-shot

16 kHz



35 x 9 x 63

Visible red

DC

4-in-1

Cabled



SU17.1 Series

- Built-in auto teach; dual 4-digit displays

LEDs (1), dual 4-digit displays

Pushbutton (4)

On delay, off delay, 1-shot

8 kHz



34 x 10 x 71

Visible red

DC

NPN, PNP

Micro pigtail, cabled

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

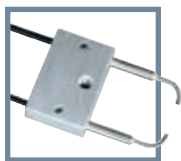


Reflectors

- 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

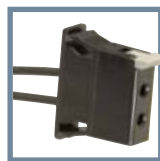


Accessories



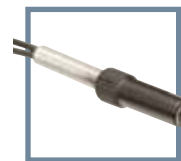
HPF-To22-H

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.

Want more information?

Simply go to: www.sensing.net/photoelectric

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PEPPERL+FUCHS
SENSING YOUR NEEDS

Rotary Encoders

- Optical encoder technology for rugged industrial environments
- Incremental encoders up to 10,000 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



A Complete Overview of Pepperl+Fuchs Rotary Encoders

Rotary encoders are among the most useful and versatile pieces of equipment available to the automation industry, providing accurate position measurement and speed feedback. 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.

The *Rotary Encoder Catalog, North American Edition* provides a complete overview of all of the incremental and absolute rotary encoder designs offered by Pepperl+Fuchs. Additionally, this 100+ page catalog includes an informative section on the Principles of Rotary Encoders. Here, we explain how rotary encoders are used and provide details on encoder types and designs together with mounting, installation, safety, and operating instructions. We also highlight the wide range of connectors, cordsets, and accessories that are available.

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 5,000 ppr while the solid shaft RVI58 provides 10,000 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.



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

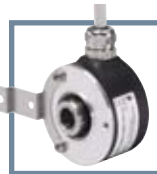
precise positioning applications with 65,536 steps per turn. Diagnostic LEDs are integrated into the removable housing cover to make troubleshooting quick and easy.



EVS/EVM58

The newest additions to our encoder portfolio are Ethernet TCP/IP absolute encoders. They provide resolutions up to 16-bit for single-turn and 30-bit

for multi-turn units. Programming and setup are easily achieved through the built-in web server that allows access through any Internet browser.



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.

Want more information?

Simply go to: www.sensing.net/encoder

Incremental Rotary Encoders



RVI25



TVI40



THI40



TSI40



TVI50



RVI50

Highlights	<ul style="list-style-type: none"> • Industry standard 2.5" housing • Solid shaft 	<ul style="list-style-type: none"> • Smallest incremental encoder • Solid shaft 	<ul style="list-style-type: none"> • Smallest incremental encoder • Hollow shaft 	<ul style="list-style-type: none"> • Smallest incremental encoder • Recessed hollow shaft 	<ul style="list-style-type: none"> • Metal disk for durability • Solid shaft 	<ul style="list-style-type: none"> • Small housing • Solid shaft
Housing Diameter	2.5"	40 mm	40 mm	40 mm	50 mm	50 mm
Solid Shaft Diameter	1/4" or 3/8"	8 mm			8 mm	8 mm
Hollow Shaft			6 mm, 8 mm, 3/16 in, 1/4 in., or 5/16 in.			
Recessed Hollow Shaft				4 mm, 6 mm, 3/16 in, 1/4 in., 5/16 in., or 3/8 in.		
Max. Shaft Speed	12,000 RPM	6,000 RPM	6,000 RPM	6,000 RPM	6,000 RPM	10,000 RPM
Pulses per Revolution	5,000	1,024	1,024	1,024	1,024	2,500
Operating Voltage	5 or 10-30 VDC	4.75 to 30 VDC	4.75 to 30 VDC	4.75 to 30 VDC	4.75 to 30 VDC	5 or 4.75-30 VDC
Output Type	RS-422 or push-pull	Push-pull	Push-pull	Push-pull	Push-pull	RS-422 or push-pull
Max. Output Frequency	100 kHz	100 kHz	100 kHz	100 kHz	100 kHz	160 kHz
Connection Type	MS connector or shielded cable	0.5 m or 2 m shielded cable	0.5 m or 2 m shielded cable	0.5 m or 2 m shielded cable	0.5 m or 2 m shielded cable	12-pin connector or 0.5 m shielded cable



Machine tools use rotary encoders to precisely control cutters or to position indexing tables.



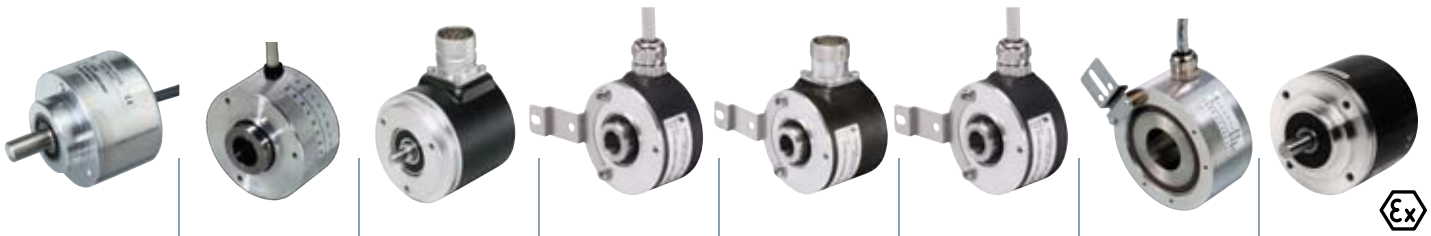
Elevators use rotary encoders to determine what floor it is on and to level the elevator car when the door opens.



Conveyors have rotary encoders built into them to track the speed and distance of objects moving on the conveyor and to position items for additional work.



Wind generators have adjustable vanes to take advantage of any wind, no matter how slight, and rotary encoders make it possible.



TVI58	THI58	RVI58	RHI58	RSI58	RHS58	RHI90	RVI84
<ul style="list-style-type: none"> • Metal disk for durability • Solid shaft 	<ul style="list-style-type: none"> • Metal disk for durability • Hollow shaft 	<ul style="list-style-type: none"> • Available with 10,000 pulses per revolution • Solid shaft 	<ul style="list-style-type: none"> • Available with 5,000 pulses per revolution • Hollow shaft 	<ul style="list-style-type: none"> • Available with 5,000 pulses per revolution • Recessed hollow shaft 	<ul style="list-style-type: none"> • Sine/cosine output • 1 V peak-to-peak 	<ul style="list-style-type: none"> • Largest hollow shaft 	<ul style="list-style-type: none"> • Intrinsically safe, up to 25 pulses per revolution • Solid shaft
58 mm	58 mm	58 mm	58 mm	58 mm	58 mm	87 mm	78 mm
6 mm or 10 mm		6 mm or 10 mm					10 mm
	10 mm, 12 mm, 15 mm or 5/8 in.		10 mm, 12 mm, or 1/2 in.		10 mm, 12 mm, or 15 mm	16 to 45 mm, 5/8 in., 3/4 in., 7/8 in. or 1 in.	
				10 mm or 12 mm			
6,000 RPM	6,000 RPM	12,000 RPM	6,000 RPM	12,000 RPM	6,000 RPM	3,500 RPM	3,000 RPM
1,500	1,500	10,000	5,000	5,000	2,048	2,500	1 - 25
4.75 to 30 VDC	4.75 to 30 VDC	5 or 10-30 VDC	5 or 10-30 VDC	5 or 10-30 VDC	5 VDC	5 or 10-30 VDC	8 VDC (NAMUR)
Push-pull	Push-pull	RS-422 or push-pull	RS-422 or push-pull	RS-422 or push-pull	Sine/cosine	RS-422 or push-pull	Namur
100 kHz	100 kHz	200 kHz	200 kHz	200 kHz	200 kHz	120 kHz	5 kHz
0.5 m or 2 m shielded cable	0.5 m or 2 m shielded cable	12-pin connector or 1 m shielded cable	12-pin connector or 1 m shielded cable	12-pin connector or 1 m shielded cable	1 m shielded cable	12-pin connector or 1 m shielded cable	2 m cable

Typical Applications:

- Machine tools
- Printing presses
- Packaging machines
- Conveyors
- Elevators
- Wind generators
- Overhead cranes
- Offshore drilling

Accessories



Measuring Wheels

All Pepperl+Fuchs measuring wheels are designed to

mount on a standard 8 or 10 mm diameter shaft. They are available with a 200 or 500 mm circumference and a wide variety of materials.



Couplings

Pepperl+Fuchs offers a variety of encoder couplings including spring steel, spring disc,

precision, helical, and bellows. Each type is available for a wide range of shaft diameters.

Want more information?

Simply go to: www.sensing.net/encoder

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PEPPERL+FUCHS
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Absolute Rotary Encoders



	<i>Single-Turn</i> <i>Multi-Turn</i>	FVS58 / FSS58 FVM58 / FSM58	AVS58 / ASS58 AVM58 / ASM58	BVS58 / BSS58 BVM58 / BSM58
Highlights		• Parallel output	• Up to 28 bits of resolution	• AS-Interface encoder utilizes up to 16 slave addresses
Interface		Parallel	SSI	AS-Interface
Housing Diameter		58 mm	58 mm	58 mm
Solid Shaft Diameter		6 mm or 10 mm	6 mm or 10 mm	6 mm or 10 mm
Hollow Shaft				
Recessed Hollow Shaft		10, 12 or 15 mm	10 mm or 12 mm	10 mm or 12 mm
Max. Shaft Speed		12,000 RPM	12,000 RPM	6,000 RPM
Operating Voltage		10-30 VDC	10-30 VDC	from AS-Interface
Max. Single-Turn Resolution		8,192	65,536	8,192
Max. Multi-Turn Resolution		4,096	16,384	4,096
Connection Type		19-pin connector, 26-pin connector, or 2 m shielded cable	12-pin connector or 1 m shielded cable	4-pin micro DC connector



Overhead cranes are positioned by rotary encoders, which also measure crane speed to prevent accidents and overruns.



Robotics use rotary encoders to provide critical data on tool location, part identification and actuator movement.



Packaging machines measure the size of an item and track the amount of material used to pack it with rotary encoders.



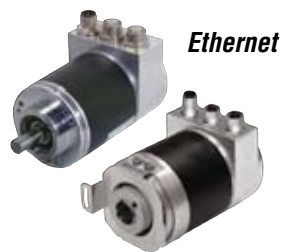
Printing presses track the amount of paper on a roll and measure where to cut using rotary encoders.



CANopen



DeviceNet



Ethernet



PROFIBUS

CVS58/CSS58
CVM58/CSM58

DVS58/DSS58
DVM58/DSM58

EVS58/ESS58
EVM58/ESM58

PVS58/PSS58
PVM58/PSM58

• Up to 30 bits of resolution

• Diagnostic LEDs

• Configuration via web browser

• Built-in programmable limit switch

CANopen

DeviceNet

Ethernet TCP/IP

PROFIBUS

58 mm

58 mm

58 mm

58 mm

6 mm or 10 mm

6 mm or 10 mm

6 mm or 10 mm

6 mm or 10 mm

10, 12 or 15 mm

10, 12 or 15 mm

10, 12 or 15 mm

10, 12 or 15 mm

12,000 RPM

12,000 RPM

12,000 RPM

12,000 RPM

10-30 VDC

10-30 VDC

10-30 VDC

10-30 VDC

65,536

65,536

65,536

65,536

16,384

16,384

16,384

16,384

Removable terminal housing
with PG glands

Removable terminal housing
with PG glands

(3) M12 x 1 connectors

Removable terminal housing
with PG glands

Typical Applications:

- Machine tools
- Printing presses
- Packaging machines
- Conveyors
- Elevators
- Robotics
- Wind generators
- Overhead cranes

Accessories



Cable Pulls

Pepperl+Fuchs cable pulls enable a rotary encoder to measure linear motion by providing a cable that is pulled in a straight line by the application. The cable is wrapped around a spring-loaded drum that turns the encoder shaft when the cable is extended. A standard 58 mm diameter encoder mounts to the adapter and different lengths are available for a variety of applications.

Want more information?

Simply go to: www.sensing.net/encoder

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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 Ethernet gateways for EtherNet/IP and PROFINET
- 24 V auxiliary power supplies for black flat cable
- 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 CANopen Vendor 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.



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.



Low-Cost Basic Gateway

In applications where low cost is the most important feature, the K25 PROFIBUS gateway is the answer. The K25 is similar to the K20 series of AS-Interface gateways, but without the graphical display, duplicate address detection, and debug port. This provides a basic, reliable gateway with a price point that is truly unique. But don't let the price fool you into thinking that this unit won't perform. The K25 gateway is totally compliant with the newly adopted AS-Interface specification 3.0. If enhanced diagnostics and display are required, take a look at our K20 series of advanced gateways. Unparalleled in the industry, these gateways offer functions that enable users to get the most out of any AS-Interface installation.



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 factors 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.



16-Channel Safety Controller

These new safety monitors are a powerful addition to the safety product offering. It can scan two networks simultaneously, has 16 safe output channels, 16 safe coupling channels, memory card, and graphical display.



Standard 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 the super low 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.



A Better E-Stop

A new 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

Gateways



Enhanced

Enhanced with Power Conditioner

Enhanced with Safety Controller

Basic

Basic

Highlights	<ul style="list-style-type: none"> • Duplicate address detection and RS-232 port • One and two network versions available 	<ul style="list-style-type: none"> • Duplicate address detection and RS-232 port • Both networks are powered off of one 30 VDC power supply 	<ul style="list-style-type: none"> • Duplicate address detection and RS-232 port • 16 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 functionality • One and two network versions available 	<ul style="list-style-type: none"> • Low-profile slim housing with top-mount connector • LCD display with pushbuttons
Specification and Profile	3.0 (M4)	3.0 (M4)	3.0 (M4)	3.0 (M4)	3.0 (M4)
PLC Connectivity					
EtherNet/IP	■	■			
Modbus/TCP	■				
PROFINET	■				
PROFIBUS	■	■	■	■	■
DeviceNet	■			■	
Modbus ASCII/RTU	■				
RS-232				■	
Diagnostics					
RS-232 Port	■	■	■		
Ground Fault Detection	■	■	■	■	■
Noise Detection	■	■	■	■	■
Duplicate Addr. Detection	■	■	■		
Over Voltage Detection	■	■	■	■	■
Approvals					
Safety					
Safe Outputs (onboard)			2 relay and 2 electronic		
Safe AS-i Outputs			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 PLC Many 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	

Network Extension



Repeaters

Highlights	<ul style="list-style-type: none"> Field mount or enclosure mount housings Built-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

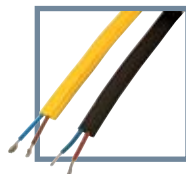
Highlights	<ul style="list-style-type: none"> Extends linear network to 200 m without repeater Low voltage diagnostic LEDs 	<ul style="list-style-type: none"> Extends linear network to 300 m without repeater Network communication and diagnostic LEDs
Length of Segment (linear topology only)	200 m	300 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.



Flat Cable Stripper

Indispensable tool for stripping flat cable with replaceable blades.

Want more information?

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

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PEPPERL+FUCHS
SENSING YOUR NEEDS

Power Supplies



AS-i



AS-i with Ground Fault Detection



Power Conditioners



24 VDC

Highlights	<ul style="list-style-type: none"> • Power/overload LEDs • High-output current in slim package • Class II power option • Low-current option for small networks 	<ul style="list-style-type: none"> • Ground fault simulator button with potential-free electronic output • Rear and side mounting options • Switch-selectable power disconnect on ground fault • Spring terminals and metal DIN rail clip for high-vibration environments 	<ul style="list-style-type: none"> • Two networks or two segments can connect to one conditioner • Enclosure or field-mount options • LED low-voltage indication • 2.8 A and 4 A field-mount versions 	<ul style="list-style-type: none"> • 115/230 VAC jumper selectable • Plastic high-voltage connector cover • Voltage adjustable from 24 V to 30 V • 3-phase power supply option
Output Current	1.8 A, 2.5 A, 4.8 A	2.4 A, 4.8 A	2.8 A, 4 A, 2 x 4 A	5 A, 10 A
Input Voltage	90-265 VAC	85-264 VAC	30 VDC	93-132 VAC, 187-265 VAC or 3 x 340-500 VAC
Output Voltage	30 V AS-i	30 V AS-i	30 V AS-i	24-30 VDC
Output Voltage Adjustable				■
IP Rating	IP20	IP20	IP20 or IP65	IP20
Mounting	DIN rail	DIN rail	DIN rail or mounting holes	DIN rail
Approvals				



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 • 4 inputs, one can be for EDM • One address for safety output channel • One A/B address for Inputs
Safe Inputs	1 or 2	1 E-Stop	-
Safe Relays	-		1
Standard Inputs/Outputs	0/2		4/0
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 • 16 channels for safe AS-i outputs
Safe Outputs (onboard)	1 or 2 relay	2 relay and 2 electronic
Safe AS-i Outputs	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

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I/O Modules



Flat (G2)



Flat (G12)



Field (G4)



Compact (G16)



Enclosure (KE)

Highlights	<ul style="list-style-type: none"> • Low-profile flat housing • Integrated addressing jack 	<ul style="list-style-type: none"> • Overload indication at each output • No tools required for installation • SPEEDCON connectors 	<ul style="list-style-type: none"> • Input wires can be cut to exact length • Anti-vibration spring terminals 	<ul style="list-style-type: none"> • Smallest field mount housing offered • Waterproof potted housing 	<ul style="list-style-type: none"> • Thinnest housing offered • AS-Interface or external power, switchable • Approved for hazardous locations
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
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/3 out, 2 in/2 out	4 in, 4 in/4 out	4 in, 4 in/4 out, 4 in/3 out
Input Type	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
Input Power Supplied By	AS-Interface/aux.	AS-Interface/aux.	AS-Interface	AS-Interface	AS-Interface/ext.
Sensor Type	PNP	PNP	PNP	PNP	PNP/NPN
Output Power	AS-Interface/aux.	Auxiliary	Auxiliary	Auxiliary	AS-Interface/aux.
Output Type	DC	DC	DC	DC	DC, Relay
Approvals	CE cUL _{US}	CE cUL _{US}	CE cUL _{US}	CE cUL _{US}	CE cUL _{US} Class 1 Div 2, groups A,B,C,D
Protection	IP67	IP67	IP65, IP67	IP69K	IP20
I/O Connection Method	Micro	Micro (SPEEDCON compatible)	Spring terminals	Nano	Keyed, removable colored terminals





Junction Box (KE1)



Junction Box (CB1)



Analog (G4, KE2)



Pushbuttons and Stack Lights



Pneumatic



Drive Control

- Low-profile housing
- Easy connection for pushbuttons & pilot lights
- Anti-vibration spring terminals option

- Lowest profile housing available
- Fully potted
- Mounting strips included

- Scaled automatically 0-10,000 or 4,000-20,000
- Powered from AS-Interface or auxiliary

- Different colored button covers available
- Red, yellow, green, blue, clear stack light options
- Audible alarm

- 4 inputs available in 2 connectors
- Pneumatics powered from AS-Interface or auxiliary

- All auxiliary powered
- M25 conduit adapter included
- Stainless steel cylindrical housing

1-31 A/B	1-31 A/B	1-31	1-31 A/B	1-31 A/B	1-31 A/B
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	1 in/3 out
2-, 3-wire, dry contact	2-, 3-, 4-wire, dry contact	2-, 3-, 4-wire	LEDs, pushbuttons	2-, 3-, 4-wire, dry contact	2-, 3-, 4-wire, dry contact
AS-Interface/aux.	AS-Interface	AS-Interface/aux.	AS-Interface	AS-Interface	Auxiliary
PNP	PNP	4-20 mA, 0-10 V or PT100	Pushbuttons	PNP	PNP
Auxiliary	AS-Interface	AS-Interface/aux.	AS-Interface/aux.	AS-Interface/aux.	Auxiliary
DC	DC	4-20 mA or 0-10 V	LEDs	Pneumatic	DC
CE cULus	CE cULus	CE cULus	CE cULus	CE	CE
IP20	IP20	IP20, IP67	IP67	IP65	IP67
Keyed, removable colored terminals	Removable terminals	Terminals		Micro, 8 mm air	20 cm cabled

Accessories



Flat Cable Splitters

Connects or splits two pieces of flat cable, 6 A capacity.



Flat to M12 Adapters

Connects 1 or 2 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.

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

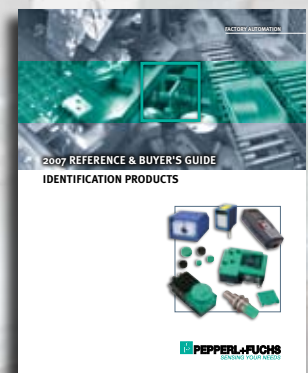


Everything you need to know about identification systems . . .

Detailed product information is available in the *Reference & Buyer's Guide: Identification Products*, 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.

The Reference & Buyer's Guide 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 100 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)	4" (100 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	100/s	1/s	50/s
Passing Speed	6 ft/s	20 ft/s	1 ft/s	10 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

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, COS, Cyclic		■
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

Want more information?

Simply go to: www.sensing.net/rfid

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 S should be used if very small embeddable tags are required. Select series MV if long read/write ranges are required.

Series Q, 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, 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



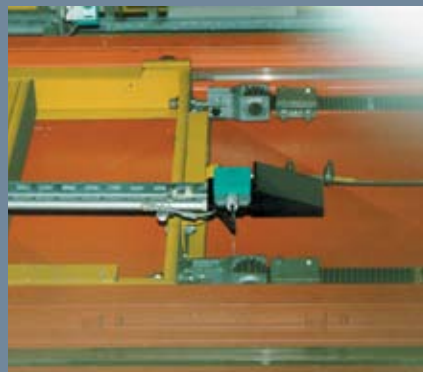
Series S

- Reads all ICC and IDC tags in our legacy product offering
- Tags embeddable in metal as small as 8 mm diameter









Series MV

- High-speed, 2.45 GHz, readers with .5 m and 2 m read range options
- 5-7 battery capacity with replaceable battery option
- 64 k tags have highest speed and capacity of any system we offer




Read Heads


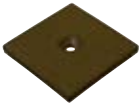




For best performance the read head choice should be similar in size to the tag chosen. Very little extra range is gained by using a very large head and a small tag. An 18 mm head and 20 mm tag is an excellent choice but an 80 mm square flat pack reader and a 12 mm diameter tag is a bad choice.

						
	18 mm	30 mm	Conveyor Reader	Limit Switch Style	Flat Pack	Large Plate Reader
Housing Material	PBT, SS	PBT, SS	ABS	PA-GF35, zinc	PBT, AL	PBT, SS
Series Q	■		■		■	
Series P	■	■	■	■	■	■
Series S	■		■		■	
Series MV						■

Surface Mount Tags

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.

						
Tag style	12 mm	16 mm	20 mm	22 mm	27 mm	30 mm
Read Range	18 mm	58 mm	58 mm	65 mm	52 mm	75 mm
Temperature	266 °F (130 °C)	302 °F (150 °C)	185 °F (85 °C)	248 °F (120 °C)	302 °F (150 °C)	212 °F (100 °C)
Read/Write Memory			1 k, 16 k	.25 k, 2 k	8 k	1 k, 16 k
Series Q			■	■	■	■
Series P	■	■	■			■

						
Tag style	50 mm	50 mm Square	68 mm	Access Card	100 mm	Plate
Read Range	110 mm	120 mm	108 mm	134 mm	157 mm	124 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)
Read/Write Memory	1 k, 16 k	1 k		1 k, 2 k, 8 k	1 k	2 k
Series Q	■	■		■	■	■
Series P	■		■	■	■	

Surface Mount Tags

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	Plate
Read Range	56 mm	111 mm	2000 mm
Temperature	185 °F (85 °C)	248 °F (120 °C)	158 °F (70 °C)
Read/Write Memory	1 k	1 k, 64 k	64 k
Series Q		■	
Series P	■	■	
Series MV			■

Embeddable Tags

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	8 mm	10 mm	12 mm	16 mm	24 mm	30 mm
Read Range	10 mm	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)	185 °F (85 °C)
Read/Write Memory	1 k	1 k	1 k	1 k	1 k	1 k
Series P			■	■	■	■
Series S	■	■				

Handheld Programmings

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



Series Q	■
Series P	■
Series S	■

Want more information?

Simply go to: www.sensing.net/rfid

Barcode Imagers

Fixed Mount Imagers



MAC344



MAC400



MAC333

Highlights	<ul style="list-style-type: none"> • Space-saving design • 6 m/s moving codes • 25 codes/s reading rate • Matchcode for QA monitoring 	<ul style="list-style-type: none"> • 6 m/s moving codes • 100 codes/s reading rate • Matchcode for QA monitoring 	<ul style="list-style-type: none"> • All common 1D & 2D codes • 3 readings/s • Omnidirectional reading
1-D Barcode Symbolologies*	Pharmacode (Black & White), Code 39, Interleaved 2 of 5	Codabar, Code 11, 39, 93, 128, Interleaved 2 of 5, Postal Symbolologies (4CB, Postnet, Planet, Australian, Royal, Japan, KIX,	
2-D Barcode Symbolologies*	Data Matrix (ECC200)	Aztec, Codablock F, Composite, Data Matrix (ECC200), PDF417, Pharmacode, QR Code,	
Reader Performance			
Field Size	29 mm x 24 mm	50 mm x 33 mm (up to 75 mm x 48 mm)	200 mm
Decoding Speed	25 symbols/s	100 symbols/s	3 symbols/s
Maximum Symbol Speed w/trigger	6 m/s	6 m/s	Stationary reads only

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

Laser Barcode Readers



VB6-240



VB8-305



**VB12-110
VB12-220**

Highlights	<ul style="list-style-type: none"> • Small size • High-speed read rate 	<ul style="list-style-type: none"> • Cost-effective • Multiple interfaces • No moving parts 	<ul style="list-style-type: none"> • Wide scanning field of view at close working distances • Low-profile option (-S)
Reading Range	40-240 mm	35-305 mm	10-220 mm
Scan Rate	1200 s ⁻¹	270 s ⁻¹	500 s ⁻¹
Raster (-R versions)			15 mm @ 220 mm
Symbolologies	EAN/UPC, I 2 of 5, 39, 93, 128, EAN128, ISBM128, Pharmacode	EAN/UPC, I 2 of 5, 39, 49, 93, 128, 16K, EAN128, ISBT128, Codabar, Delta IBM	Code 2/5, Code 39, Code 93, Code 128, EAN/UPC, EAN 128, Codabar, Plessey, Pharmacode

Handheld Imagers



MAH120

- Reads all popular 1D and 2D barcodes
- Durable overmolded housing and secured cable ensure drop-shock survivability
- Low-priced, wired only version



MAH200

- All common 1D & 2D codes
- 3 readings/s, omnidirectional
- Wireless, USB, PS/2, serial Interface



MAH300

- Keypad and display
- All common 1D & 2D codes
- 3 readings/s, omnidirectional
- Wireless, USB, PS/2, serial Interface

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

GoCode (except MAC400), Maxicode, Micro PDF417, MSI Plessey, RSS Stacked, OCR (MAC400 only), MICR (MAC400 only)

200 mm	200 mm	200 mm
3 symbols/s	3 symbols/s	3 symbols/s
Stationary reads only	Stationary reads only	Stationary reads only



VB14A-300

- Medium range
- Code reconstruction
- Optional oscillating mirror



VB14A-600

- Long-range scanning
- Code reconstruction
- Optional oscillating mirror

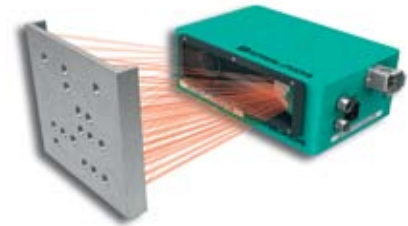


VB34

- Very long working ranges
- Industrial interfaces

50-300 mm	200-600 mm	500-2500 mm
500-800 s ⁻¹	600-1000 s ⁻¹	600-1200 s ⁻¹
18 mm @ 300 mm	24 mm @ 500 mm	
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	Code 2/5, Code 39, Code 93, Code 128, EAN/UPC, EAN 128, Codabar

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 VOS300 Series vision sensors bridge 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.

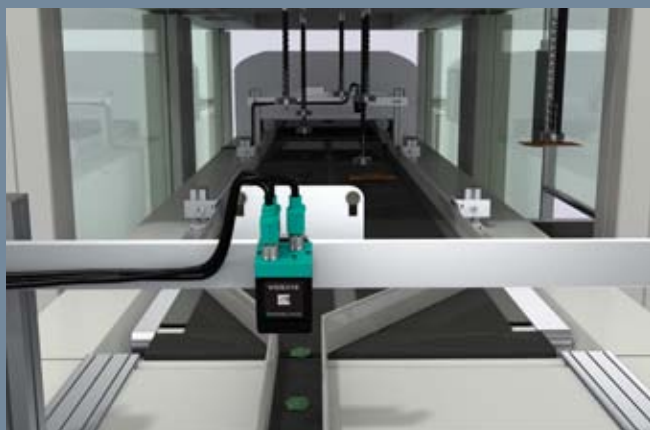
- Detects the position of an index hole
- Large capture range
- Large detection range
- Integrated contrast compensation
- Compact design
- Integrated illumination



Print Recognition Monitor

The VOS410-BIS Print Recognition Monitor is your complete solution to printing and binding needs. It can read barcodes or print/graphic images at up to 12 readings/second traveling at 240"/second. The unit has a built-in encoder input so it can electronically slide up or down the page to automatically capture the most unique image area. This assures you of the most reliable operation even with difficult graphics images.

- Automatic learning of the reference image
- Independent search for optimum image
- Saves the last five error images in memory
- Integrated illumination



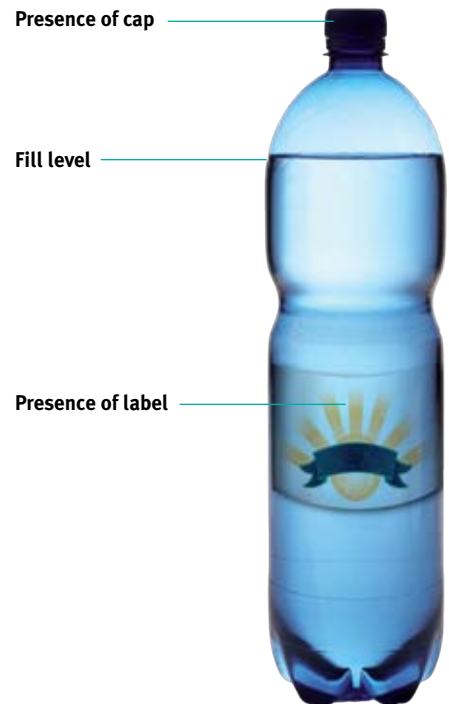
VOS300 Series Vision Sensors

The VOS300 Series products are industrial vision sensors that are 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.



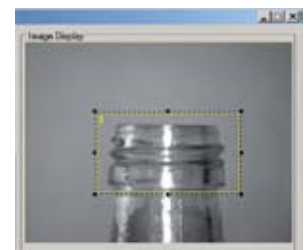
Feature Checks	1	6
Jobs	1	16
Sensing Distance	20 mm – 500 mm	
Field of View	8 mm x 6 mm – 150 mm x 120 mm	
Optical Resolution	12 µm/pixel – 240 µm/pixel	
Light Source	Integrated, White light	
Connection Interfaces	RS-422, Ethernet	
Inputs	1 x 24 V, 1 x TRG optically isolated	
Outputs	4 x 24 V, PNP optically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



The VOS 300 series 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.

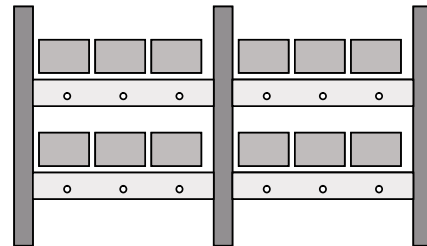
An automatic light exposure regulator is integrated in the sensor to compensate for the different reflection characteristics of the racking profiles.

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.

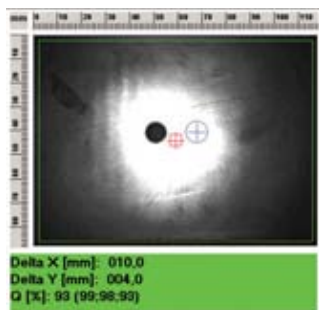


VOS120

Object Distance	200 or 300 mm
Object Size	Hole diameter 10-15 mm (10-15% of the capture range)
Illuminaton	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

Subject to modifications without notice

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PEPPERL+FUCHS
SENSING YOUR NEEDS

PosiTrack Absolute Position Tracking System

The PosiTrack system from Pepperl+Fuchs brings fraction-of-a-millimeter position feedback to a wide range of industrial and commercial applications. Across the world, overhead monorails, automated storage and retrieval systems, gantry cranes, floor conveyors, elevators, even theater stage lighting systems rely on the PosiTrack system for accurate position control.

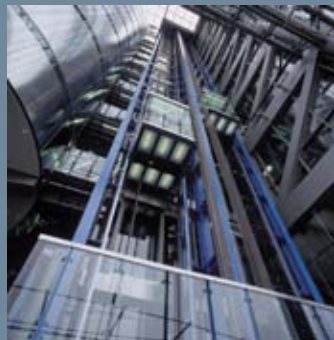
The PosiTrack system consists of three basic components:

- Read Head
- Code Rail & Support Hardware
- Network and Control Interfaces

PosiTrack's U-shaped read head optically scans a uniquely coded rail to determine a carrier mechanism's position. An internal microprocessor translates a 48 sender/receiver LED array status into a 19-bit positional code, providing 0.8 mm resolution over travel distances to 1,030 feet. Communication is provided in RS-485 or SSI format (user-specified), directly compatible with many controllers. Or, it can be converted to almost any standard network bus protocol using a PosiTrack Control Interface. Setup couldn't be easier, since PosiTrack read heads require no calibration!



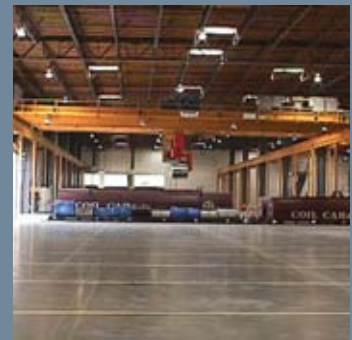
PosiTrack helps synchronize overhead and floor-based conveyors in chassis "marriage" systems.



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



PosiTrack's 0.8 mm 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.



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.

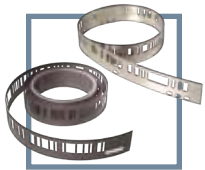


Control Interfaces

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.

Bus-compatible interfaces can control up to four read heads. To designate a read head bus address, simply configure the two address DIP switches internal to the read head housing.

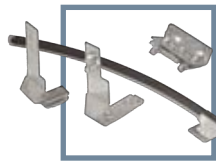


Code Rail

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.



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.

Want more information?

Simply go to: www.sensing.net/positrack



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

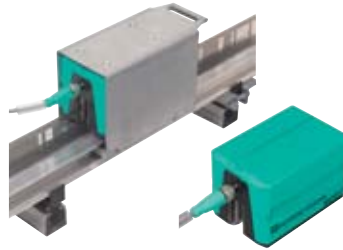


WCS2B PosiTrack Systems are ideal for positioning dip racks during anodizing and galvanizing processes.



The WCS3B provides continuous positional feedback of the car body throughout the assembly process.

Read Heads



WCS2B



WCS3B

RS-485 to PosiTrack Network Interface	WCS2B-LS221	WCS3B-LS221
RS-485 to PosiTrack Parallel or SSI Interface	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

DeviceNet



WCS-EIG210

EtherNet/IP



WCS-PG210E

PROFIBUS DP



WCS-MBG110

Modbus RTU



WCS-IS310

SSI - binary



WCS-IP110

Parallel - binary

Code Rail

Fiber-Laminate



WCS2-CS55-L1

WCS3-CS70-L1

The best choice for most applications, fiber-laminate code rails offer low cost, easy handling, and excellent durability.

Stainless Steel

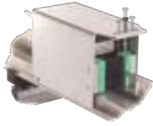








WCS2-CS55-M1

WCS3-CS70-M1

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_	WCS3-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

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 **PEPPERL+FUCHS**
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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, conveyer 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.

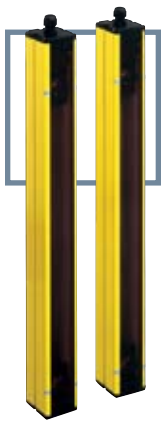


SLC14 / SLC30 Light Curtains - Finger and Hand Detection

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

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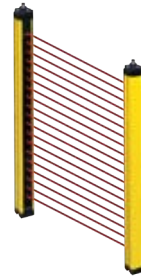
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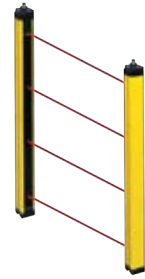
Machine Safety Sensors



**SLCS/SLCT Series
Light Curtains**



**SLC Series
Light Curtains**

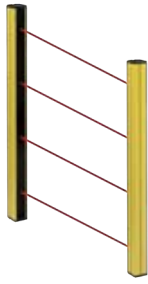


**SLC-2, -3, -4
Light Grids**

Highlights	<ul style="list-style-type: none"> • Ultra-slim profile (only 20 x 30 mm) for unsurpassed mounting flexibility • 14 mm (finger detection), 30 mm (hand detection), 60 mm, or 90 mm resolutions • Innovative mounting accessories • Selectable startup/reset interlock, beam coding, external relay monitor 	<ul style="list-style-type: none"> • 14 mm resolution for finger detection or 30 mm resolution for hand detection in point-of-operation safeguarding applications • Lightbar diagnostics for pre-fault indication, status/fault codes • Selectable startup/restart interlock • Beam coding prevents crosstalk 	<ul style="list-style-type: none"> • 2-, 3-, 4-beams for body detection in entry and perimeter access applications • Lightbar diagnostics for pre-fault indication, status/fault codes • Selectable startup/restart interlock • Beam coding prevents crosstalk
Operating Range	SLCT: 0.2-8 m SLCS: 0.4-8 m	SLC14: 0.2-5 m SLC30: 0.2-15 m	0.2-20 m
Protected Height	14 mm: 100-1200 mm 30 mm: 100-2400 mm 60, 90 mm: 300-2400 mm	150-1800 mm	500, 800, 900 mm
Approvals and Certifications	TÜV, CUL, CE	TÜV, CUL, CE	TÜV, CUL, CE
Safety Type accord to IEC61496	SLCT: Type 2, SLCS: Type 4	Type 4	Type 4
Emitter Element	Modulated infrared LED	Modulated infrared LED (880 nm)	Modulated infrared LED (880 nm)
Aperture Angle	± 2.5°, per IEC61496	± 2.5°, per IEC61496	± 2.5°, per IEC61496
Enclosure Protection Rating	IP65	IP67	IP67
Enclosure Type	SLCT: Aluminum extrusion, silver anodized SLCS: Aluminum extrusion, gold anodized	Aluminum extrusion, RAL1021 (yellow) coated	Aluminum extrusion, RAL1021 (yellow) coated
Optical Face	Clear polycarbonate	Plastic; optional protective glass available	Plastic; optional protective glass available
Outputs	2 independent 24 VDC PNP semiconductor monitored channels	2 independent 24 VDC PNP monitored channels, 500 mA; 1 PNP each for start monitor and OSSD status, 100 mA	2 independent 24 VDC PNP monitored channels, 500 mA; 1 PNP each for start monitor and OSSD status, 100 mA
Connection Type	Standard micro connectors, Receiver: 8-pole, Transmitter: 4-pole	Standard micro connectors, Receiver: 8-pole, Transmitter: 4-pole	Standard micro connectors, Receiver: 8-pole, Transmitter: 4-pole
Optional Features	Quick-release clamp bracket Top-to-top mounting bracket	Cascade (master/slave) Relay monitor (EDM) Muting (via SafeBox controller)	Relay monitor (EDM) Muting (via SafeBox controller)

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



SLP Series Light Grids

- 2-, 3-, 4-beams for body detection in entry and perimeter access applications
- Long range (to 65 m) for workcell perimeters & along conveyors
- Uses SafeBox controller to form a complete safety system

0.2-65 m

500, 800, 900 mm

TÜV, CUL, CE

Type 4 (with SafeBox controller)

Modulated visible red LED (665 nm)

± 2.5°, per IEC61496

IP65

Aluminum extrusion,
RAL1021 (yellow) coated

Plastic; optional protective glass
available

2 normally-open force-guided
contacts, 10 mA to 6 A load
current (via SafeBox controller)

Internal wiring chamber/
terminal strip

Startup/restart Interlock
Diagnostic display
Muting
(all via SafeBox controller)



SLA12 Series Sensors

- Rugged die-cast metal housing
- Compact size fits in tight spaces
- Alignment aids and "signal reserve" indication on receiver
- Rotatable connector or fixed cable for mounting flexibility
- Uses SafeBox controller to form a complete safety system

0.2-10 m

n/a

TÜV, CUL, CE

Type 4 (with SafeBox controller)

Modulated visible red LED (660 nm)

± 2.5°, per IEC61496

IP67

Frame: zinc, pressure die-cast
Sides: plastic

Plastic

2 normally-open force-guided
contacts, 10 mA to 6 A load
current (via SafeBox controller)

Micro connector, rotatable by 90°,
or 2.5 cm fixed cable

Startup/restart Interlock
Diagnostic display
Muting
(all via SafeBox controller)



SLA29 Series Sensors

- Long range (65 m) for workcell perimeters & along conveyors
- Visible red light for simple installation and alignment
- Alignment aid and "signal reserve" indication on receiver
- Uses SafeBox controller to form a complete safety system

0.2-65 m

n/a

TÜV, CUL, CE

Type 4 (with SafeBox controller)

Modulated visible red LED (660 nm)

± 2.5°, per IEC61496

IP67

ABS plastic,
RAL1021 (yellow)

Plastic

2 normally-open force-guided
contacts, 10 mA to 6 A load
current (via SafeBox controller)

Micro connector or
terminal compartment

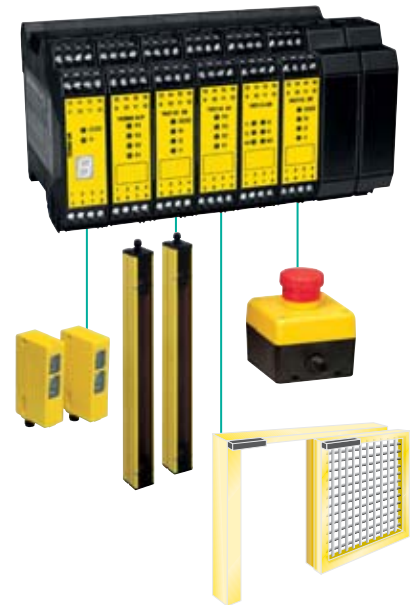
Startup/restart Interlock
Diagnostic display
Muting
(all via SafeBox controller)

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

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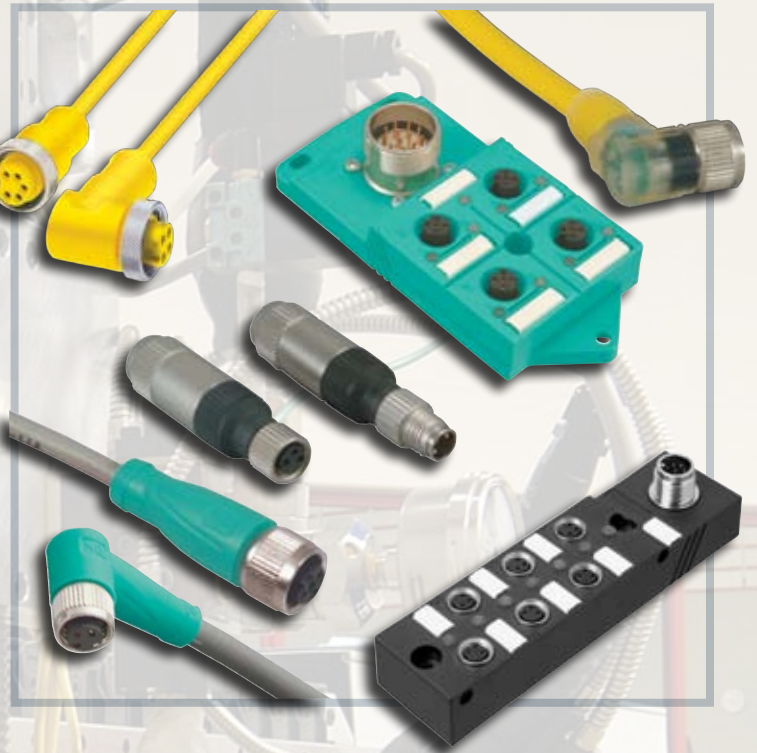
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Cordsets

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, or irradiated PUR cable jacket
- 4-, 5-, & 8-pin
- 18 & 22 AWG
- NPN & PNP LED versions

Micro AC cordsets (1/2"-20)

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

Cordset Accessories

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

Mini cordsets (7/8"-16)

- Compatible with AC & DC sensors
- Yellow ST00W cable jackets
- 3-, 4-, & 5-pin versions
- Meets SAE specifications

Nano cordsets (M8)

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



Insulation Displacement Connectors

Insulation Displacement Connectors (IDC) provide the fastest method to add a connector to a cable by eliminating screw terminals, soldering, and the need to strip each conductor. No special tools are required. Pepperl+Fuchs Insulation Displacement 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.

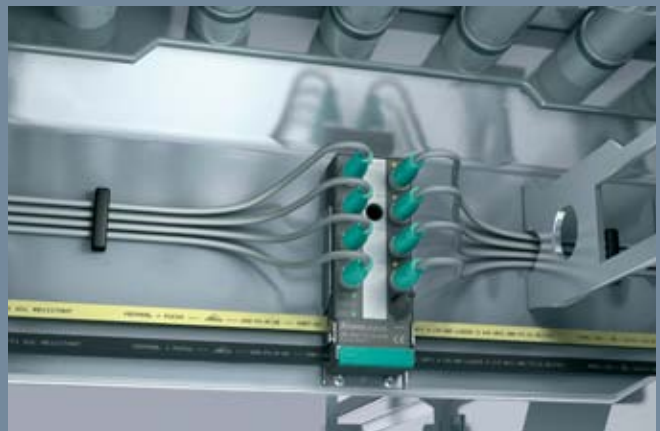


M12 Micro DC Cordsets

A comprehensive range of M12 Micro 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, although custom lengths are offered. High pressure washdown, IP68/IP69K versions are also available.

Want more information?

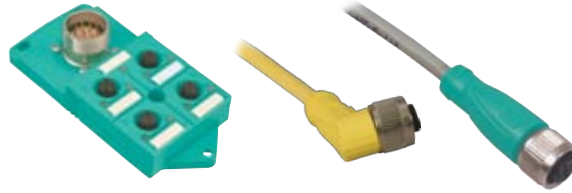
Simply go to: www.sensing.net/cordset



CORDSETS AND JUNCTION BOXES

Micro DC

Micro AC



4-pin (V1)

5-pin (V15)

8-pin (V17, V19)

3-pin (V12)

4-pin (V124)

Face View

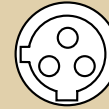
M12

M12

M12

1/2 in.-20

1/2 in.-20



Yellow Jacket PVC & PUR



Braided Shield



STOOW (TPE)

Gray Jacket PVC & PUR



Black Jacket PUR



Irradiated PUR



Blue Jacket NAMUR



Extension Cable



Receptacles



Field Attachables











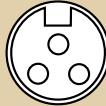
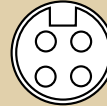
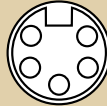


Dual Port Junction Blocks



Multi-Port Junction Boxes



		Nano		Mini		
						
5-pin (V125)	4-pin (V11B)	3-pin (V3)	4-pin (V31)	3-pin (V93)	4-pin (V94)	5-pin (V95)
1/2 in.-20	M12	M8	M8	7/8 in.-16	7/8 in.-16	7/8 in.-16
						
■	■	■	■	■	■	■
		■	■	■	■	■
		■	■	■	■	■
		■	■	■	■	■
		■	■	■	■	■
		■	■	■	■	■
		■	■	■	■	■

Special Application Cables:

- Shielded M12
- PROFIBUS
- CAN
- Irradiated PUR
- Valve connection



Irradiated PUR Cordsets

Cross-linked, halogen-free cable is great for welding applications



PROFIBUS Cables

Purple cordset with B-coded M12 connection for PROFIBUS



Valve Connection

Interface cables with LED and protective circuit for valve position sensors



NAMUR Cordsets

Blue PUR cables used with NAMUR sensors in hazardous locations

Want more information?

Simply go to: www.sensing.net/cordset

FACTORY AUTOMATION – SENSING YOUR NEEDS



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

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