Truck and Trailer Stats

Outside Dimensions: 50' L x 9' W x 12' T

Weight: 11 tons

Maximum occupancy: The Mobile Exhibit can comfortably accommodate up to 10 visitors. For larger firms, please schedule visitors in groups.

Presenter

Ed Myers
Mobile Exhibit Sales Specialist
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PHOTOELECTRIC

R100 Series
- Multiple mounting styles in one housing type
- Mounting variants with 6-pin plug interface
- Wide temperature range from 40°C to 80°C
- Pulse IFST / IPEX

R101 Series
- Wide use in extremely small spaces
- Stainless steel mounting fixture
- Measuring with dual-switch point sensors
- 4-20 mA output reduces inventory costs

R103 Series
- Standard industry-standard housing
- M8 screw or through body mounting
- Measuring with dual-switch point sensors
- 4-20 mA output reduces inventory costs

R300 Series
- Distance measurement by pulse ranging technology
- Incidental range detection range up to 60 m
- Precise and repeatable results on all objects regardless of color, surface texture
- Single or dual switch point outputs

MLV12 Series
- Rugged 4-pin metal housing
- Highly visible dual LED indication
- Temperature operation option to 40°C

Series 31
- Mini-range sensing in compact housing
- 12 versions with powerful 4-20 mA output
- Smaller AC/DC housing with integral relay output
- Color coded to easily identify sensing mode

Series 61
- High visibility, 4-position status LED indication
- Integral terminal, sensitivity and mode selection
- Multipurpose, rugged, IP67 housing
- 4-in-1 output features sensor selection

42F7 & 90F Series
- Ultra-small housing for extremely confined spaces
- User-friendly design for simple installation and operation
- Compact photoelectric family
- Powerful LED and laser light sources

K79 & K171 Series
- Self-contained output requires no amplifier
- Clear aesthetic alternative to fiber optics
- Signal strength indication
- Scratch-resistant glass lens

2G940 Series
- Durable metallic M12 connector housing
- Adjustable sensitivity for customer needs
- Powered by LED lamp for easy alignment
- Light output on mode selected by wiring

Basic M18 Series
- Mini-cylindrical versions in rugged metal housing
- Mounting angle as small as 40 m
- Adjustable sensitivity
- Bright output on mode selected by wiring

V10 Series
- Straight 3-pin connector M18 cylindrical housing
- 4-20 mA output in dry, wet or ambient conditions
- 4-20 mA output in dry, wet or ambient conditions
- Light output on mode selected by wired connection

Mobile Exhibit Panel - Photoelectric
PHOTOELECTRIC

This panel is meant to emphasize the depth as well as the variety of the standard photoelectric sensors that Pepperl+Fuchs offers. The sensors on this panel are among the most successful photoelectric sensors that Pepperl+Fuchs offers, but by no means are they the only ones. From the smallest housing sizes to the largest, from durable plastic housings to heavy-duty stainless steel, and from diffuse mode to retroreflective, Pepperl+Fuchs has a photoelectric sensor for applications in any industry.

The following are the main points to keep in mind when discussing each of the featured photoelectric families.

R100 Series: **
- Multiple mounting styles in one housing type and available in every sensing mode, including measurement. High IP67/IP69K rating and wide -40° C ... +60° C ambient temperature range

R101 Series: **
- Miniature rectangular sensor that is cost-effective and available in every sensing mode, including dual switch point models. High IP67/ IP69K rating and wide -40° C ... +60° C ambient temperature range

R103 Series: **
- Extremely versatile sensor with 4-in-1® outputs and a unique design available in every sensing mode, including clear object detection. High IP67/IP69K rating and wide -40° C ... +60° C ambient temperature range

R300 Series: **
- PRT measurement engine provides long-range detection at an unmatched price point. Advanced set modes open up new application possibilities

MLV41 Series: **
- Robust, aluminum housing with Delta-Seal® coating to protect against harsh chemicals used in the print and paper industry

MLV12 Series: **
- Rugged, metal frame with rotatable connector for durability and added mounting flexibility

Series 31: *
- Cost-effective sensor with double to triple the sensing distances of comparable sensor housings

Series 28: **
- Exceptionally versatile, multipurpose sensor with powerful optical performance for dusty environments or long-range requirements

Series 61: **
- One-piece design with industry-standard housing offering powerful optical performance at entry-level prices

KT9 & KT11 Series:
- Pepperl+Fuchs’ smallest, self-contained, cylindrical photoelectric sensors, offering a durable, stainless steel housing

12GM40 Series:
- Cylindrical sensor with a metal housing for applications that require M18 size power in a smaller, more compact housing

GLV18 & GLK18 Series: *
- Pepperl+Fuchs’ most affordable sensor. Industry-standard, M18 cylindrical sensor with a large variety of sensor models to choose from

Basic M18 Series:
- Cost-effective, M18 cylindrical sensor with a rugged, metal housing provides durability without sacrificing value

V18 Series: **
- M18 cylindrical sensor with a metal housing offers high-end features including 4-in-1® outputs, models with a laser light source

R2(F) & R3(F) Series
- Ultraminiature housing size for extremely small spaces. Powerful LED and laser light source options.

Many of these photoelectric families are equipped with a set of features for optimal performance, such as:
- Cross-talk protection (except for thru-beam mode) so that multiple sensors can be used in close proximity
- Increased ambient light resistance, even with high-frequency, energy-saving lighting
- High-visibility status LEDs that can be placed in multiple locations of the housing or in domed windows for visibility from different directions
- Enhanced status LED indication so that other operating modes can be easily determined, such as short-circuit protected mode or marginal signal strength
- Inventory-friendly, 4-in-1 output means that one sensor output can be used as either NPN or PNP, light ON or dark ON, and automatically selects its output based on the connected load

Families that have all of the above features are denoted by ** and families with some of the above features are denoted by *

Product Managers
Tom Corbett and Michael Turner
Mobile Exhibit Panel - Fiber Optic & Slot Photoelectric
FIBER OPTIC & SLOT PHOTOELECTRIC
This panel is intended to showcase Pepperl+Fuchs’ fiber optic and photoelectric slot sensor offering.

Pepperl+Fuchs Slot Sensors
Slot sensors offer many of the advantages of a thru-beam sensor, including reliable detection of opaque or reflective objects, and the high optical power or “burn-through power” required for unfavorable ambient conditions such as moisture and dust. Yet, standard thru-beam sensors have a distinct disadvantage when mounting and electrical installation is considered. Slot sensors are arranged in a U-shaped housing that aligns the optical axis and requires only one electrical connection. Because the emitter and receiver are perfectly aligned, higher switching speeds and increased reliability result.

GLD3 Series:
• Designed specifically for detecting labels including paper labels, foil labels, and many types of semitransparent labels
• Super-fast response time allows for greater line speeds and reducing waste

GLS Series:
• Self-contained, miniature sensor available with a fixed cable or flat connector option
• Available in seven mounting styles

GL2 & GL3 Series:
• Ultra-miniature, cost-effective basic function slot sensor with 2 mm or 3 mm slot width
• Many mounting configurations available

GL Series:
• Robust sensor with a metal housing, glass optical face and available in a large assortment of slot widths (10 mm to 220 mm)
• Each sensor is cross-talk protected, allowing multiple devices to be stacked together

GLP Series:
• Plastic housing and optical face for applications where a cost-effective sensor is critical
• Available in a large assortment of slot widths (30 mm to 120 mm)

RAL Series:
• A light-grid with advanced features in a metal, slot-sensor housing. Reliable detection of targets as small as 0.5 mm
• With high switching speeds, one-shot timer and beam suppression, this sensor is perfect for counting and detecting small parts

Pepperl+Fuchs’ Fiber-optic Sensors and Cables
Fiber-optic sensors and cables are used in many applications, including environments with extreme temperatures, mechanical shock, electrical noise, corrosive chemicals, or when detecting very small objects. Pepperl+Fuchs provides fiber-optic sensors with different benefits as described below, some for use with plastic fiber-optic cables, some for glass fiber-optic cables, and some for use with either. Plastic fiber-optic cables are preferred for their smaller size, flexibility, lower cost, and ability to be cut. Glass fiber-optic cables are favored for their ruggedness, ability to weather greater temperature extremes and mechanical damage, and higher optical power.

ML17-LL Series:
• All the features of the standard ML17 series combined with an easy ¼-turn cam-lock fiber cable connection
• For use with some glass and all plastic fiber-optic cables

SU18 & SU18/35 Series:
• SU18 series are high-speed fiber sensors for general-purpose applications, available with potentiometer or pushbutton programming
• SU18/35 series are high-power fiber sensors for general-purpose applications, available with potentiometer or pushbutton programming

RL(K)61-LL Series:
• One-piece design with industry-standard housing offering powerful optical performance at entry-level prices
• Universal fiber-optic connection allows compatibility with a large variety of glass fiber-optic cables

VL18LL Series:
• M18 cylindrical sensor with a metal housing offers high-end features including 4-in-1® outputs and cross-talk protection
• Wide selection of glass fiber-optic cables with easy-to-use, screw-on adapter

SU19 Series:
• Application solver for more complex fiber-optic sensing requirements
• Display is different from other types because it is a percentage, not an arbitrary value, which makes it much easier to understand and apply to multiple sensors.

MLV41-LL Series:
• Robust, aluminum housing with DELTA-SEAL® coating to protect against harsh chemicals used in the print and paper industry
• Large variety of glass fiber-optic cables with simple, push-lock adapter

Fiber Optic Cables:
An assortment of glass and plastic fiber-optic cables are shown on the panel. The offering includes fiber heads that are cylindrical, right-angled, array, bendable probe, rectangular, slotted, etc. Fiber cables can be high-flexibility, high temperature, metal sheathed, for liquid level, chemically-resistant, etc.

Product Managers
Tom Corbett and Michael Turner

Mobile Exhibit Panel Overview
ADVANCED PHOTOELECTRIC

Distance Attract
- Distinct infrared sensing determines presence and proximity
- Background suppression offers cleaner, more reliable detection
- Displays real-time distance feedback
- Multiport output connects up to 10 devices
- photo-flashing technology increases detection by taking advantage of the right timing

Color, Contrast, & Luminance Sensors
- Sensitivity to color variations and subtle changes in color intensity to discriminate objects
- High-speed output detection for better localization, and improved performance
- Detects invisible obstacles and irregular objects that other sensors cannot

Automatic Light Grids
- Shaped light projected horizontally
- Wide range of resolution & viewing angles
- Adjustable intensity control
- Adjustablealphanumeric to meet different applications

Optical Data Transmitters
- Wireless data transfer over long distances
- Maximum wireless transmission and WiFi transfer options
- Waterproof in indoor data transfer
- High-speed Ethernet transfer capability

Laser Distance Measurement
- Accurate, reproducible measurements even in hostile areas
- Distance-based sensing determines position & presence
- Two-sensor modes with analog & digital outputs
- Membrane key for easy navigation

RS232C Filtering
- Long distance range of up to 30 m
- Flexible design with RS485, Ethernet
- Adjustable resolution without D/T
- Selectable output mode for various needs
ADVANCED PHOTOELECTRIC

This panel features some of Pepperl+Fuchs’ advanced photoelectric sensors. These sensors are the industry “problem-solvers” and are among the finest that Pepperl+Fuchs has to offer. Historically, sensors incorporating advanced technologies like background suppression proved too costly and were used only where traditional sensors failed to solve the application requirements. Thanks to Pepperl+Fuchs’ innovative use of modern technology, along with decades of experience, they are now flexible and affordable enough to use as an alternative to traditional sensors, improving accuracy, sensing distance, and efficiency while maintaining affordability.

A Distance Ahead:
The new generation of photoelectric sensors from Pepperl+Fuchs marks a breakthrough in sensor technology by combining standard sensors with the latest measuring methods to provide the highest levels of precision and reliability for object detection.

- **SPT:** Single-pixel technology is the triangulation of reflected light to a differential diode. SPT sensors are unaffected by an object’s color and detect object presence and distance without sacrificing sensing range. With a standard diffuse sensor, only the amount of reflected light that is received is evaluated. Because of this, only object presence is detected and sensing ranges are highly color dependent.
- **MPT:** Multi-pixel technology refers to multiple photodiodes receiving light and is a powerful alternative to traditional triangulation of light to a single, differential diode. Because each of the photodiodes functions independently as a single receiver, the sensing threshold and detection window of the sensor can be customized to suit a wide range of new and existing applications.
- **PRT:** Pulse ranging technology is the most accurate, industry-grade process for measuring distance. Sensors that incorporate this technology emit light in short pulses and accurately measure the time it takes the light to return. Pepperl+Fuchs’ PRT sensors are unlike anything offered by competitors, providing exceptional sensing distance and high accuracy at entry-level prices.

Color:
These sensors evaluate an object’s color by separating the received light into several portions of the light spectrum. Each of these portions returns a value of intensity that reflects the spectral properties that define the color of the object. We offer several color sensors to store up to 10 color channels in 1 device. Applications include part sorting/color quality check and wire color sequence confirmation.

**Luminescence:**
A luminescence sensor emits modulated, ultra-violet light. Suitable materials (luminophores), either inherent to the material or intentionally added, are stimulated by ultra-violet light and emit visible light that is received and evaluated by the sensor. These materials include optical brighteners in white paper, but they are also components in certain kinds of chalk, paint, oils, greases and print marks. Applications include:
- Detect invisible marks on mass-mailing envelopes, verify tamperproof seal presence
- Monitor the presence of adhesives, oil, grease, and inks

**Automation Light Grids:**
Monitoring a large surface or irregularly-shaped object can be easily accomplished by using a light grid. In a typical light grid, a number of emitters are stacked, in parallel, inside of a single housing. Likewise, the receivers are combined into a separate housing. The end result is a thru-beam sensor containing a grid of light beams. A new light grid concept that combines all emitters and receivers into a single housing is the retroreflective area sensor. This sensor stores the level of light received from the reflector into memory. As an object passes between the sensor and reflector, the level of light decreases by a certain percentage and the output will change accordingly.
- Reliable detection and super-fast response regardless of shape or texture
- Variety of field heights and resolutions available at incredibly low prices
- IO-Link compatible models add value and flexibility

**Contrast:**
A contrast sensor evaluates the difference in brightness between an object and a marking on it. The color of the emitted light or the color of the marking must be selected so that as large a contrast as possible is achieved. Pepperl+Fuchs’ contrast sensors are lightning-fast and available with multiple light spot sizes and orientations for convenient mounting. Common applications for contrast sensors:
- Registration mark detection, print mark trigger, detect expiration dates on containers
- Monitor small marks on motor shafts for speed control

**Optical Data Transmission:**
Optical data couplers provide wireless data transfer via a modulated light beam. They are used in pairs with one aimed at the other along a line-of-sight axis. Unlike WiFi or RF-based communications, they are immune to noise interference and have a consistent data transfer rate over all specified distances. Unlike wired communication methods (drag cables or slip rings), they offer unparalleled flexibility and resilience.
- Fast protocol-free transfer of all industrial Ethernet, with the speed to transmit live video signals.
- Other transfer methods include discrete NPN or PNP signals, RS-232, RS-422, Current Loop 20 mA, PROFIBUS, and Interbus
- Provides data transfer for overhead monorail systems, mobile transport units, and automated guided vehicles

**Laser Distance Measurement:**
This technology allows fast and simple distance measurement distance along a line-of-sight axis using a laser light. This position feedback requires minimal infrastructure, as no guidance rails or track are required. These sensors accurately identify how far away an object or reflector is with negligible effect due to object color, ambient lighting or light from other photoelectric devices. Two technologies are used.
- Triangulation measurement technology is available with the VDM18 family for short distances. Triangulation relies on the geometry of light reflected by an object to the sensor’s receiver to determine—within a fraction of a millimeter—where an object is located.
- Pulse Ranging Technology (PRT) is offered with the VDM28 and VDM100 family, for medium and long distances, respectively. It sends intense bursts of light (up to 1,000 times stronger than other technologies) to an object or reflector and precisely calculates distance based on the amount of time it takes for the reflected light pulse to be seen, using the speed of light as a constant.

Product Managers
Tom Corbett and Michael Turner
ULTRASONIC

777 Series
- Liquid level
- All metal high pressure
- Multiple porous materials
- Body made of 316 stainless steel
- Shell made of 316 stainless steel

LE Series
- Pulse width or PNP/NPN programmable
- Analog or switch point output
- Scan area up to 11 feet
- 6-way quick-plug sensing head

Surface Mount
- Low profile
- Analog or switch point output
- Pole or board mounting

EE Series
- Scan area up to 22 feet
- Analog or switch point output
- Fiber optic standoff adjustable

Mini Cylindrical
- Sense range 0.050 in. diameter housing
- Analog or switch point output
- Integration high-sensitivity sensing heads
- High sensitivity LED

Hazardous Locations
- CSA I, II, III, Division 1
- UL Listed
- FM Listed
- Class I, Division 1
- Class II, Division 1
- Class III, Division 1
- Class I, Division 1
- Class II, Division 1
- Class III, Division 1
- Class I, Division 1
- Class II, Division 1
- Class III, Division 1

Stainless Cylindrical
- Pressure or pressure sensor
- Analog or switch point output
- Scan area up to 10 feet
- Stainless-steel cover

Low-Profile Level Control
- Sensing range 0 to 10 feet
- Ultra-low-profile housing
- Analog or switch point output
- Integral zero-error adjustment

Chemically Resistant
- PTFE-coated body
- Stainless-steel component
- Fastening washers or nuts
- Analog or switch point output
- Temperature compensation

Double Sheet, Label, & Spike Detection
- Thin sheet detection
- Ultra-thin materials
- Stainless-steel components
- Optional RS-232 output

Food-Grade Design
- Sense range 0.050 in.
- 100% stainless steel housing
- Analog or switch point output
- 1200 psi withstand rating
Mobile Exhibit Panel Overview

ULTRASONIC
Pepperl+Fuchs is the world’s largest manufacturer of industrial automation ultrasonic sensors.

Ultrasonics fill an important need in industrial automation, as they overcome many of the shortcomings of their optical counterparts:

Ultrasonics sensor benefits
- Unaffected by target color changes
- Offer a multitude of analog output options
- Reliably detect transparent objects
- Provide unparalleled performance in dirty/dusty environments
- Great for collision avoidance on autonomous vehicles

NEW for 2017-18: F77 Series:

The smallest, most cost-effective ultrasonic sensor family now offers:

- “Snout-mount” housing
- Pushbutton programmability
- Software parameterization options
- Intelligent blanking of unwanted echoes
- 10 selectable beam angles

Product Marketing Manager
Marcel Ulrich
Mobile Exhibit Panel - Encoders

ENCODERS

T-Series Incremental
- Environmental
- Solid, reinforced housing, and fanless shaft version
- Compact design
- Cables in digital M12 connector

MN20/MN16 Incremental
- No bearings
- Encapsulated magnets, cost savings
- Preassembled sensor electronics
- High-performance timing

EN158 Incremental
- Microcontroller technology
- Improved signal quality
- Thru-bolt flange
- Improved resolution and accuracy
- Solid, reinforced housing, and reduced shaft runout

Washdown Incremental
- Stainless steel, extreme washdown
- Single-gear operation with housing
- Approved for ECOLAB detergent
- Used for the food and beverage industry

EN11HD Incremental
- High resolutions
- High-precision encoder
- High vibration and shock resistance
- 36 arcmin 28 mm mounting hole diameter

Rotary Encoder and Cable Pull
- For linear displacements
- Variety of outputs and cable lengths available
- Incremental and absolute encoder options

Magnetic Encoders Absolute
- High accuracy
- Housing diameters of 35 mm, 45 mm, and 55 mm
- A variety of outputs and accuracies
- High reliability
ENCODERS
This panel highlights the many uses and options that Pepperl+Fuchs’ rotary encoders have.

T-Series Incremental is a low-cost series (lower than the R-Series). Shown is the 40 mm diameter housing, but 50 mm and 58 mm diameter housings are also available. This series has a wide voltage range of 5-30 VDC which includes push-pull and RS422 line driver outputs.

MNI40 Series is an incremental encoder that has no moving parts, so it has a very long service life. The magnetic wheel is available with a variety of bore-hole dimensions, which include 25 mm and 1”. If a non-standard bore hole is needed, please discuss details with Pepperl+Fuchs representative.

Washdown incremental encoder shown is RVI58L; this has a high-grade stainless steel (316L) housing, flange, and shaft. It’s ideal for the food and beverage markets, but can also be used in other markets where a stainless steel housing and high IP ratings are needed. The MNI40 and ENA42HD Series also have an IP69K washdown rating.

ENI58IL incremental encoder has BlueBeam technology that has high precision and accuracy. The ENI58 also has universal output and high environmental ratings. By combining the BlueBeam technology design with a highly advanced housing design allows the ENI58 standard offering to meet your specialized application. There are many connection options, shaft sizes, and flange styles available to adapt to most applications.

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

Encoder and Cable Pull enable you to measure linear motion. Cable pull and encoder combinations are available with standard incremental and absolute encoders. Our cable pulls range from a very lightweight compact housing to a very heavy-duty design. The ECN10TL is the lightweight with a compact housing cable pull. The ECN20IL has a rugged aluminum housing with flexible cable exit and entry point cable pull. The ECN30PL also has a rugged aluminum housing and flexible cable exit/entry point, but also has larger diameter cable and additional accessories to increase the flexibility and durability in tough environments. The consistent linearity and very low hysteresis is assured by having an axial drum movement via threaded spindle. The ECN40HD is used for even harsher environments. This cable pull version has an open cable system that allows easy cleaning. A grooved cable drum and guided wheel ensures accuracy and very low hysteresis. This cable pull product portfolio provides accurate measurement and durability, and can be integrated into most applications.

Magnetic absolute rotary encoders have < 0.1° of accuracy. Pepperl+Fuchs magnetic rotary encoders can be used in a wide variety of applications because the technology advantages brings precision, robustness, reliability, and a compact housing. There are many protocols available for the ENA36, ENA42HD, and ENA58 series encoders. They include analog, CANopen, J1939, EtherCAT, Profinet, and SSI.

Please allow us to help you select an appropriate rotary encoder for your application. Thank you.

Product Manager
Robert Pasho
Mobile Exhibit Panel - Connectivity

CONNECTIVITY

Field Attachable Connectors
- Connectors to facilitate cable management
- Various installation styles
- VHS, M12, & mini-styles

Multiport Connection
- Reduced overall cabling
- 2 up to 16 channel connections
- Compact design for tight spaces
- Options available for various industry needs

Noncontact Connection
- Wireless power & signal
- Time for isolated systems
- Transfers electric power without contact
- 30 mm cylindrical or 80 mm cable styles

Cables
- Quick disconnect cables & connectors
- Connectivity for all popular sizes
- PVC & PUR cable variants
- Custom concepts possible
CONNECTIVITY

The top left of the panel highlights our assortment of field attachable connectors and splitter T adapters. The field attachable connector ends are available in M8, M12 and MINI 7/8" styles. The M8, M12 and MINI styles are available with screw connections. The M12 and M8 models are available in insulation displacement style allowing quick and easy wire connection to the connector end, as well as built-in quick and easy color-coded wire location indication. Metal connector M12 styles that can accommodate braided, shielded cables are also available. The T-splitter connection is ideal for use with multiport I/O blocks allowing a single port connection to be used with two individual sensor connections.

On the top right you can see an assortment of multiport junction blocks. These blocks can be used to reduce individual sensor wiring lengths by allowing groups of sensors to be wired to the junction block and then running a single cable (home run) back to the control panel. The multiport junction blocks are available in M8 and M12 styles, 4, 6, 8 and 16 sensor connectable versions. All standard models allow PNP sensor connection with 5 meter PUR home run connection cables. As you can see from the panel, models are also available with either M12 or M23 threaded cable disconnection. Also in this group is our Mobile Equipment version with improved sealing and corrosion resistant M12 connectors.

In the lower left position we have the WIS wireless inductive system, which allows the connection free coupling of power and signal between a primary side (panel) and the secondary side (machine) sensors. The version shown is the new cylindrical pair with longer range and higher power. This updated system now only includes 3 components, making installation quicker. The system consists of the following 3 components:

- WIS primary side cylindrical sensor (transmitter)
- WIS secondary side cylindrical sensor (receiver)
- WIS secondary side connection module

The system operates on the principle of inductive coupling and consist of primary and secondary electronics. For the purpose of energy transfer, an inductive alternating field is created on the primary side and when the secondary circuit enters this field, a voltage is induced through inductive coupling and the energy is transferred to the secondary device. The amount of energy coupled across the air gap is sufficient to operate inductive, optical or ultrasonic sensors that may be mounted directly on the machine components. The signal states of the sensors can then be transferred to the primary side with individual transmission pulses and are made available to the control system via the DIN mount interface module. This system is idea for modular systems where sensors are mounted onto a movable or changeable machine element. The sensor power and signals can be coupled without physical connection between the stationary control side and machine side. This could allow the interchanging of the machine element without disconnection of sensor power and signal wiring.

On the lower right side of the panel you see the assortment of sensor connectivity cables that are available from Pepperl+Fuchs. The cables are available in a range of sizes and configurations from M8, M12, and MINI connection cables in various cable lengths, end types, and wire connection pin counts. Included on the panel is also our new style splitter cable, our DIN type valve solenoid connectors and the new Mobile Equipment over-molded DT cordsets. We offer the following cable connector styles and sizes:

- M12 (Micro DC ) [3-, 4-, 5-, and 8-pin]
- 1/2"-20 (Micro AC) [3-, 4-, and 5-pin]
- M8 (Nano) [3- and 4-pin]
- 7/8"-16 (Mini) [3-, 4-, and 5-pin]
- Over-molded DT series mobile equipment connection cables [3-, 4-, and 6-pin]

Cable jacket types include (from good to best):

- PVC – good, general-purpose, most cost effective
- PUR – step up from PVC, better for oils, fungus, oxidation and ozone, higher tensile strength and elongation.
- STOOW (Mini only) - Heavy-duty cord with oil-resistant thermoplastic jacket
- PP – Wash-down and Hygienic design cordsets with polypropylene cable jacket to endure caustic wash-down chemicals
- POC – TPE blended cable jacket highly resistant to temperature. Excellent for high temperatures generated by welding environment. Cable jacket is rated up to 150 °C and can easily withstand the hot weld spatter generated by automotive weld cells.

Product Marketing Manager
David Rubinski

Product Manager for WIS
Gerry Paci
Mobile Exhibit Panel - Inductive Position
**Inductive Position**

This panel represents a particular class of position sensors. All of these devices are based on inductive sensor principles comprised of a dual or multiple coil array arrangement. The sensors on this panel can be used to monitor valve position or absolute position for a variety of applications requiring analog output position detection.

The top half of the panel highlights our solutions for valve position detection with dual coils. The dual position sensors family has three housing styles, which include the F25, F31, and F31K2.

The variety of housing styles and mounting options allows dual position sensors to be mounted on most valve/actuators. The dual position sensors will indicate whether your valve/actuator is in the open or close position. All housing styles (F25, F31, and F31K2) have IP67 protection with variety of outputs available, but the F31K2 has options for IP69K protection, -40C, and ½” NPT conduit entrance.

The bottom half of the panel highlights our solutions for continuous position detection. Our family of inductive position measurement (PMI) is designed for critical positioning tasks in rough environments, providing extremely high repeatability, accuracy, and resolution.

The F90 position measurement device has a detection range of 3 mm and is available in two output versions:
- Analog outputs: 4-20 mA or 0-10 VDC
- Analog outputs: 4-20 mA signal and two teachable switch points for limit value
- Measurement length: 40 mm, 80 mm, 104 mm, and 120 mm

The F110 design is the next generation of the F90 design, offering measurement lengths of 210 mm to 960 mm with accuracy similar to the F90, this inductive position measurement system is noted for its extremely long detection range of 6 mm – target from sensor face. The F110 position measurement devices are available with:
- Analog current: (4-20 mA) or voltage (0-10 VDC) signal
- Measurement length: 210 mm, 360 mm, 510 mm, 810 mm, and 960 mm

The F112 & F166 have all the advantages of the F90 and F110, but for applications where short measurement length and compact mounting is required. It has a measurement range of 0-14 mm and a 0-10 VDC analog output.

The F130 is a 360° angle measurement system with 0-10VDC or 4-20 mA current outputs as well as two switch points. A digital output model is also available with three PNP outputs, an ideal alternative to three individual proximity sensors monitoring shaft position. All analog and digital outputs can be configured via pushbuttons on the PMI360DV housing. The pushbuttons allow the user to configure the analog output angular range, increasing signal direction (CW or CCW), as well as the active PNP output window for the configured switch point outputs.

**PMI Features**

- Very good repeatability
- Noncontact detection
- High resolution and accuracy
- Configurable limit points
- Inductive principle of operation

Please allow us to assist you in selecting the appropriate sensor for your valve or linear position need. Thank you

**Product Manager**
Robert Pasho
**Position & Vision**

The Position Feedback panel highlights four optical technologies that provide both short- and long-range absolute position feedback.

**The PosiTrack PV** is a camera-based system that scans a custom, self-adhesive data matrix tape. It is a quantum leap beyond competitors’ barcode-based systems, which are comparatively very susceptible to code band contamination. Barcode systems are 1970’s technology. Data matrix is today’s technology.

**The PosiTrack PGV** – the optimal solution for tracking automated guided vehicles (AGVs) – is the only product on the market to combine navigation, tracking, and position feedback in one device. Colored paint/tape defines the route, while Data Matrix codes provide absolute positioning, and control codes signal upcoming turns and bends. It uses a 2D camera to scan the codes and simultaneously detect the routing tape position to provide navigation and absolute position feedback with 0.1 mm resolution. The X and Y position, and the vehicle turn angle, together with the operating status of the read head are accurately detected at all times and continuously reported. And with the wide reading window, branches, intersections, and even tight curves are seamlessly traversed.

**The PosiTrack WCS** is an LED-based product, with hundreds of thousands of units installed worldwide over the past 20 years. It uses either a stainless steel or laminate coded rail to generate positional information. Its strength (versus the other two technologies) lies in its prolific optical burn-through power.

**Laser Displacement**’s strength, in comparison to the two PosiTrack technologies, lies in the ease of set up. No adhesive code bands or rails are required. Simply align the emitter + reflector and the system is ready for commission. Note - unlike the PosiTrack systems, laser-based products cannot navigate curved travel paths.

**SmartRunner** – Light Section Sensors with SmartRunner Technology – Reliable, high-precision measurement independent of surface texture and color is the hallmark of light section sensors. Using triangulation, the height profile of a contour is recorded and supplied for evaluation. The SmartRunner is optimized and preconfigured to handle specific applications. The first two models will be the SmartRunner – Matcher, a specialist for Profile Comparison, and the Detector, for high-precision monitoring. With simple outputs of ‘good’ or ‘bad’, a compact housing with swiveling connection and diagnostics using an integrated camera, the SmartRunner is equipped to handle the toughest tasks all while being user friendly.

**Matcher:**
- 350 mm sensing range with 180 mm wide max detection zone
- Programmed using a reference or ‘teach’ target and comparing recorded images for good or bad output

**Detector:**
- 700 mm sensing range with 350mm wide max detection zone
- Detects any deviation from the previously taught background (objects as small as 1mm)

**Photoelectric portion of the Position Feedback Panel:**

**VDM100 Laser Measurement**

VDM100 has 0.1 mm resolution, less than 0.5 mm repeat accuracy (repeatability), and +/-2.5 mm or +/- 3.5 mm absolute accuracy. It has a display on the front which indicates distance and is programmed by pushbuttons, and some models allow EtherNet/IP, PROFIBUS, SSI, and Interbus communications. It is available in retroreflective mode and employs Class 1 (measurement) and Class 2 (alignment) lasers.

**2D Laser Scanner R2000**

Distance measurement with PRT, 360° detection angle, razor-sharp scan plane, high angular and positioning accuracy, compact design with LED display

**R2000 Detection:**

General-purpose, 2D laser scanner with digital I/O
- 4 discrete inputs/outputs (selectable)
- Simple configuration software – define up to 4 fields
- 10 m / 30 m detection range (object/reflective)
- Angular resolution: 0.071°, 0.15°, or 0.20°
- Scan frequency: 10, 20, or 30 Hz

**R2000 UHD:**

Ultra-high density distance measurement device.
- Dense measurement capability – up to ¼ million scan points/s
- Fast Ethernet interface – TCP/IP protocol
- 10 m / 60 m detection range (object/reflective)
- Scan frequency: 10-50 Hz
- Angular resolution: 0.014° to 5°

This is a raw distance data device - Customers must have the capability of writing their own application software.

Measurement data is aggregated into scans. Each scan corresponds to one revolution of the sensor head, and yields a sequence of samples (also called scan points). The number of samples within each scan is another user-specified parameter. Each scan can contain as many as 25,200 samples or as little as 72 samples.

1. A simple command protocol using HTTP requests (and responses) is provided in order to parameterize and control the sensor.
2. Sensor scan data (distance, angle, amplitude, time stamp, etc…) is received using a separate TCP/IP channel.
3. Scan data packets include generic header, scan data specific header, timestamp, distance measurements (in mm), signal strength (optional).

**Multi-Ray LED Scanner, R2100**

The R2100 is a distance measurement device that collects multiple measurement points over a wide area (90 degrees) with no moving parts and without lasers.
- Serial interface – RS232 protocol
- 8 m detection range
- Wide operating temperature range and IP67 rating
- 11 infrared LED emitters
- 1 mm / 8° resolution (distance/angle)
- Scan rate: 20 ms

This is a raw distance data device - Customers must have the capability of writing their own application software.

1. Sensor scan data provided upon request in one 50 byte telegram.
2. Each telegram includes distance (mm) and amplitude measurements for each LED channel (11 total).
HARSH DUTY

The Harsh Duty panel highlights Pepperl+Fuchs products specially designed for environmentally demanding applications.

Inductive Mobile Equipment sensors are installed on wheeled vehicles including garbage, cement, and fire trucks. They are commonly used on agricultural machinery and forklifts. With the capability to function flawlessly at temperatures to -40 °C and an IP69k protection rating they’re also popular in “non-mobile” sensing environments like freezers and car washes.

The new mobile equipment inductive design features a 5 – 60 VDC operational supply, enabling uninterrupted sensing performance even during the voltage “dips” sometimes generated by battery-based power supplies. Also new is the addition of integral molded Deutsch connector pigtails.

Harsh Duty Encoder – These types of encoders have IP68 and IP69K protection with a large temperature range of -40 °C to 85 °C. They can also have higher bearing loads and higher vibration/shock ratings. This will provide the durability needed in these harsh environment while providing your positioning need. Output available is analog, CANopen, J1939, and SSI.

Inclination products – The F99 family of inclination sensors are based on (MEMS) technology, microelectronic gravity measurement system and a microcontroller allowing the F99 inclination sensors to be easily configured to measure the incline or tilt angles of machine elements or equipment platforms ranging from 0° to 360°. Available in single- or dual-axis versions with 4 to 20 mA or 0 to 5 VDC analog outputs, these sensors offer flexibility and accuracy in a robust package. Switching outputs and measurement range are easily adjusted with two teach-in buttons that enable the product range to be customized to each application requirement. The sensing head is easily removed from the metal mounting bracket with only one screw. Also available is the IMU version with both 3 axis acceleration and 3-axis gyroscope elements. Pepperl+Fuchs fusion algorithm optimize the performance the whole system and as a result, external acceleration forces can be significantly reduced to provide an ideal inclination measurement for your mobile equipment or other harsh environment applications.

Product Marketing Manager
Marcel Ulrich

Product Manager
Robert Pasho
Mobile Exhibit Panel - Proximity
PROXIMITY
As the world’s largest sensor manufacturer, Pepperl+Fuchs offers sensors that can be used in a vast range of applications, from the most basic to the most challenging. With over 10,000 active models, we can surely meet the needs of your application.

The top row of sensors shows Pepperl+Fuchs’ Basic Series inductive sensors, which provide the ultimate combination of accuracy, durability, and cost-effectiveness.

The top left shows short-range, rectangular style inductive sensors. Our smallest miniature sensor, the F79 style, is now available with M8 pigtails. These sensors are ideal for small, compact machine applications. Also shown on the panel is our newest rectangular style the F76, with reinforced mounting hole. The F1 rectangular style is one of our more popular styles with sensing range up to 8 mm and a wide variety on output types and connection configuration.

The top center shows short-range miniature inductive 3 mm diameter to 6.5 mm diameter, The panel includes our newest subminiature model with sensing range of 1 mm in a smooth barrel, 3 mm diameter housing. The top right shows an example of our standard cylindrical inductive in 8, 12, 18, and 30 mm diameter threaded barrel styles. These are the most common models and used for a wide range of basic metal sensing applications. Most cylindrical styles are available in 2-, 3- and 4-wire DC as well as 2-wire AC styles.

In the middle, on the left, are the inductive reduction factor 1 cylindrical style sensors. These sensors can detect all metal types at the same sensing distance. If you are using aluminum, stainless steel, copper, or mild steel, the sensing distance will be guaranteed to the sensor rated distance. In this family of sensors you will find our longest range 18 mm diameter flush mount sensor with a nominal sensing range of 12 mm. The reduction factor 1 inductive proximity switches utilize two air-core coils that are electrically coupled, ensuring that equidistance detection is possible irrespective of the characteristics of the target metal. Reduction factor 1 sensors enable users to adapt to new products quickly without needing to replace sensors. All reduction factor 1 models are also available in weld-immune models for automotive weld-cell applications.

In the middle, on the right, is a sampling of our most common capacitive sensors. Cylindrical styles with sensitivity adjustment are available in 12 mm, 18 mm, and 30 mm diameters, while our very popular surface mount rectangular F46 style is also shown. The cylindrical capacitive sensors include some of our newer models including our redesigned 30 mm diameter family.

The bottom row highlights Pepperl+Fuchs’ long-range rectangular sensors. Starting on the left, we can see the reduction factor 1 flat pack and Rhino series. Both models are available in weld immune models.

On the bottom right side, you can see standard long-range rectangular inductive products. From left to right, we see the popular Rhino series shown with the quick release clip style (L2) mounting bracket. This 40 x 40 mm cube also is available utilizing a die-cast metal mounting bracket (L2M) model. Both versions feature 360 degree high visibility power and output LEDs. A weld immune L3M version is also available for automotive applications offering a rock hard sensing face and metal casting to repel weld slag. All Rhinos feature the 5-way Quick Pivot sensing head that rotates with just a twist of the hand. Models are available in 3- and 4-wire DC, and 2-wire AC versions. Next we see the flagship 5-way limit-switch-style sensor with wire connectable terminal base and conduit entrance. The flat pack models follow, first with the new smaller flat pack (FPS) style sensor 60 mm x 77 mm, available in ranges of 25 mm shielded and 30 mm unshielded. Next is our standard 80 mm x 80 mm industry standard flat pack with standard sensing range of 50 mm in a shielded housing.

Product Marketing Manager
David Rubinski
Mobile Exhibit Panel - Industry 4.0
Industry 4.0 Panel

Industry 4.0: New Challenges for Automation

Envisioning factories of the future, Industry 4.0 presents the automation industry with new challenges. It creates a scenario of fully networked production systems that exchange data not only horizontally within the production processes but also vertically up to higher-level information systems such as MES or ERP – or even beyond company boundaries. While this scenario enables communication at any time between any subscriber and at any hierarchy level, the current status of many factories continues to be traditional machine communication on the control level. It is for these companies that Pepperl+Fuchs is developing sensor solutions that are paving the way for the innovations of Industry 4.0.

New generation of sensors: Communication-Ready for Industry 4.0 Applications

Fully networked production systems require a communication-ready sensor technology that would allow sensor data to be transferred effectively. Pepperl+Fuchs is providing a new generation of innovative sensor solutions for use in Industry 4.0 scenarios.

SmartBridge Technology

The SmartBridge® Interface

SmartBridge® easily connects between the sensor and an IO-card, making permanent installation, temporary integration, or even retrofitting easy. No additional power source is necessary. The replaceable SD card also allows long-term logging of process, operation, and status data. Once powered up, SmartBridge® uses Bluetooth LE to communicate with smartphones and tablets that are running the SmartBridge® app.

Remote Control of IO-Link Devices

The SmartBridge® system offers all the benefits of a user-friendly remote control. Field devices in accessible locations can be accessed remotely.

IO-Link Master

If the interface is plugged into a connection between an IO-Link-compatible device and a conventional control unit, or is being used entirely without a machine control, its built-in master takes over. In this operating mode, SmartBridge® supports the display of all device information as well as the parameterization of IO-Link sensors and actuators.

IO-Link Status Monitoring

Monitor mode allows users to monitor the communication between an IO-Link device and the IO-Link master at any time. The SmartBridge® interface is the only module of its kind to offer this type of monitoring with no impact or interference on the process.

Data Logging

The SmartBridge® interface features a slot for a microSD card where process and status data, as well as random malfunctions are stored for later analysis. SmartBridge® also supports the effective verification and documentation of the error-free operation of a machine.

New Fieldbus modules

Ethernet IO Blocks

Pepperl+Fuchs’ new Ethernet IO modules offer a number of innovative features. With a versatile multi-protocol capability, they provide optimum efficiency for standardizing manufacturing facilities. Integrated, decentralized control function allows modules to be programmed independent of the PLC – simplifying programming and optimizing processes. These innovative, high-performance communication modules can help optimize your installations.

Product Manager

Danius Silgalis
Mobile Exhibit Panel - Identification

IDENTIFICATION

HF RFID
- Short-range systems up to 13.56 MHz
- Read/write and embedable bus connectivity
- Compliant with EPC Class 1 Gen 2 standards
- ISO 18000-6C standard allows for interoperability
- Tag available in metal for hostile applications

UHF RFID
- Long-range readers to up to 10 ft
- Battery-free tags toмон with 905 MHz or 868 MHz readers
- Tags connect to metal components using motherboards
- Scalable antenna position for variable tag separation
- Multi-tag reading for up to 10 tags in free field or near field

RFID Controllers
- Ethernet, RS-232/485, Modbus/TCP, and OPC-UA protocol
- Wired or wireless connection to the reader
- Industrial metal housing for severe EMC shielding
- Function blocks for Siemens, Omron, Bosch, etc.

High-Temperature Optical
- Virtually impossible at metal high-plate
- Custom-calibrated optical sensors
- Designed for high-temperature probe inputs up to 500°C
- Effective connectivity
IDENTIFICATION
The Identification Systems panel is broken up into four sections: RFID controllers, HF RFID, UHF RFID, and high-temperature optical.

RFID Controllers
These controllers handle all communications between your PC or PLC and the RFID system. Network interfaces such as EtherNet/IP, PROFINET, PROFINET, Modbus/TCP, EtherCAT, RS-232, and CC-Link are possible. 4 channel, 2 channel, and 1 channel versions are possible in most of the network protocols listed above. These controllers let you wire up your read heads with a standard 4 conductor shielded cable. Up to 1000 meters can be run from the controller back to the read head.

HF RFID
R/W heads
3 high-frequency read heads are represented on the panel. These specific read heads were chosen to focus primarily on the 3 models that offer the highest speed and lowest cost. HF read heads displayed are: IQH1-FP-V1 flat pack, IQH1-F61-V1 conveyor reader, and the IQH1-18GM-V1 cylindrical model. Besides the housing style and sensing range, they all have exactly the same capabilities. Additional models are also available including the IQH1-F15-V1 which has the longest range and largest housing and the 30MW1 model which is ATEX approved for hazardous locations.

Tag
Tags must match the selected read/write (R/W) head family (IQC with IQH1 and IPC with IPH). Tags are offered in many different sizes and memory. The size of the tag (and R/W head) will determine the maximum read distance and width of the read coil. Tags are application specific. The following installation situations are common: in-metal, on-metal, in-air (e.g., on a nonmetallic material like wood, ceramic, plastic, etc.). Some tags are designed for higher-temperature applications. Whenever possible, a high-frequency solution should be considered. There are more tags available and the read speed of these tags makes them a better fit for reading-on-the-fly applications. We offer several IQC33 tags with FRAM, allowing an unlimited number of writes. All other tags use EEPROM, which is typically limited to 100,000 write operations. Read operations are always unlimited. All HF tags offer both a read-only memory section plus a R/W section. For HF operations, we can offer a dedicated read only tag. The R/W tags offer both a read-only section and a R/W section.

UHF RFID
If you need a read or write range longer than 4", you must use UHF RFID. Additional parameters must be configured for a UHF RFID application. We have simple-to-use, free RFIDControl software that can be used to set up the RFID system, but most people just parameterize the readers directly in the PLC.

R/W heads
We have two models of UHF read/write heads. The F190 is a small, compact reader that gives you a 2 m range. This is preferred reader for most applications. If 2 m range is not enough, the F192 reader will give you 5m range. Power is adjustable in both models. However keep in mind, power adjustment can cut the read range by more the 50%. The F190 can be adjusted from 50 mW to 500 mW and the F192 can be adjusted from 10 mW to 4 W. Lower power gives you less range and more power increases the range. Use as little power as required by the application.

Tags
Not all the UHF tags available are displayed on the panel. If you search for IUC*FR2 or IUC*GBL then you will find all available models. GBL models are for global use. This means that these tags can be used by any read head we offer. The FR2 models only work with readers that end in FR2. High quantity UHF tags can be as low as $.10 per tag.

High-Temperature Optical
The OIT code plate is read and evaluated by an optical reader that can be up to 450 mm from the code plate. The OIT code plate reader offers an Ethernet TCP/IP interface. A direct EtherNet/IP interface does not exist, but that type of connection can be realized using a third-party conversion device. The tag can be read at 500 °C. The reader cannot be subjected to that temperature. Customers can order code plates from Pepperl+Fuchs or take advantage of a program we are offering to generate their own codes. Our steel code plates must be painted before use; preferably using a light-reflective paint. Our stainless steel code plates can be used without prior painting.

Product Manager
Danius Silgalis
Mobile Exhibit Panel Overview

AS-INTERFACE
This panel shows the main categories that make up an AS-Interface system: Enclosure or field mountable modules (slaves), gateways/safety monitors (masters), and accessories – e.g., power supplies, G10 splitters, stack lights (infrastructure).

Enclosure mountable modules include:
- **KE5 modules** – Newest enclosure-style modules. Simple to handle. Cleaner machine design – cables are hidden behind the cover. Front push-in terminals simplify and speed up installation.
- **KE3 modules** – Safety enclosure-style modules. Module has 4 inputs and a relay output. Enables safe switching sequences to be achieved remotely in the field.
- **KE modules** – Enclosure-style modules. Great selection including modules with inputs only, inputs and outputs, and inputs with relay outputs. Use color-coded removable terminals.
- **KE1 modules** – Enclosure-style modules. Ideal for compact junction boxes where height may be limited. Easy mounting by snapping onto DIN rail.

Field-mountable modules include:
- **G11 modules** – Field-mountable modules. Innovative seal concept. Robust, compact, round design particularly suitable for machine builders and harsh and process environments.
- **G12 modules** – Field-mountable modules. High-end offering with metal M12 inserts. Completely tool-free installation. Offered in many different variants including an 8-input version.
- **PCB-style modules** – Typically used in pushbutton boxes. Outputs are AS-Interface powered. As a result, the output current is limited, but it is still enough to power LED indicators.

Analog I/O modules
Analog I/O modules are important niche products. We offer panel- and field-mounted versions. Field-mounted analog modules offer very fast analog-to-digital conversion times. They also offer an exceptional operating temperature range and excellent (i.e., low) temperature drift.

Gateways/Safety Monitors
AS-Interface gateways are available for all standard buses such as: EtherNet/IP, PROFINET, PROFIBUS, DeviceNet, and CC-Link. Gateways control the AS-Interface system and make the process data available to all higher-level networks of the PLC in a defined configuration. Easy integration into Rockwell PLCs is now possible with –EV Gateways by taking advantage of a customized toolkit from our website.

Safety monitors are available for smaller applications that require safety. Safety monitors are a great way to achieve a low-cost, safe output on AS-Interface. Keep in mind that AS-Interface safety can be added to any network regardless of age or master type.

Accessories
Pepperl+Fuchs offers all the accessories you’ll need to put your AS-Interface network together – from spools of flat cable to repeaters, terminators, handheld programmers, and more. We offer a variety of power supplies: 30 V with data decoupling and 24 V or 30 V without data decoupling. Power supplies are needed to decouple the power and data transferred on the same cable on an AS-Interface network.

We also offer a variety of G10 passive splitters. These splitters are easy to use, compact (mountable in 30 mm cable tray), have a high IP rating, and come in many different styles. These are particularly useful for setting up different topologies. Applications that require AS-Interface networks to extend beyond 100 meters require a repeater. The network segments remain at 100 meter lengths. However, the repeater regenerates the signal, allowing the network to be extended another 100 meters.

We offer a large variety of indicating elements – LED light elements, flashing elements, and audible alarms available with different sound levels. Terminal compartments can be used with either AS-Interface or standard digital applications. AS-Interface applications can stack the elements 4 high and standard applications 5 high. Mounting is at a right angle, but straight or conduit connections are also available.

Product Manager
Daniu Silgalis
Your automation, our passion.

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

**Industrial Sensors**
- Proximity Sensors
- Photoelectric Sensors
- Industrial Vision
- Ultrasonic Sensors
- Rotary Encoders
- Positioning Systems
- Inclination and Acceleration Sensors
- Fieldbus Modules
- AS-Interface
- Identification Systems
- Displays and Signal Processing
- Connectivity