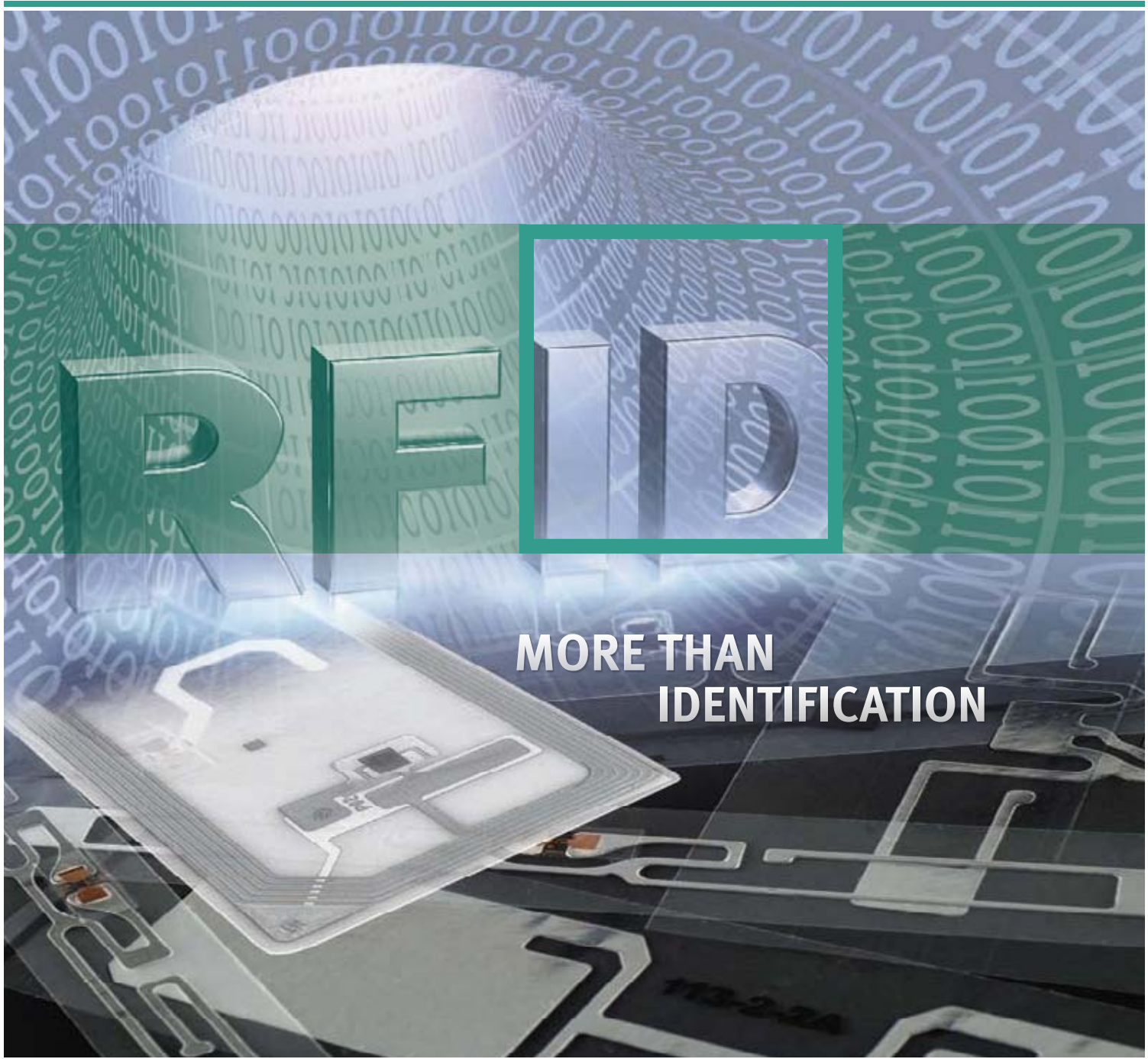


SENSING YOUR NEEDS

20 years of industrial RFID from Pepperl+Fuchs
Page 2-3

Hygienic Design
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**MORE THAN
IDENTIFICATION**

EDITORIAL

Dear Reader,

■ 2010 was an extremely turbulent year. Following an historically unparalleled economic crisis, the effects of which could still be felt during the first few months of the year, incoming orders for automation technology grew at an almost breathtaking rate as the year progressed. Incoming orders have now stabilized at a level higher than before the crisis. This position is also supported by the positive figures from the VDMA (German Engineering Federation), so we look to the future with optimism.

To provide the best support in this economic environment, we have consistently continued to work on innovative sensor and system solutions. That's why it gives us great pleasure to be able to present to you a wide range of innovations at the upcoming 2011 Hanover Industrial Fair.

There is a new addition to the family of sensors optimized for use in food processing. In addition to the solid metal ultrasonic sensor, we now also offer photoelectric and inductive sensors with EHEDG approval and corresponding mounting solutions. In addition we will be showing you the progress we are making on the topic of "Sensing by Ranging" in photoelectrics.

But there's even more to discover. Be inspired by the following pages and visit us at the 2011 Hanover Industrial Fair.

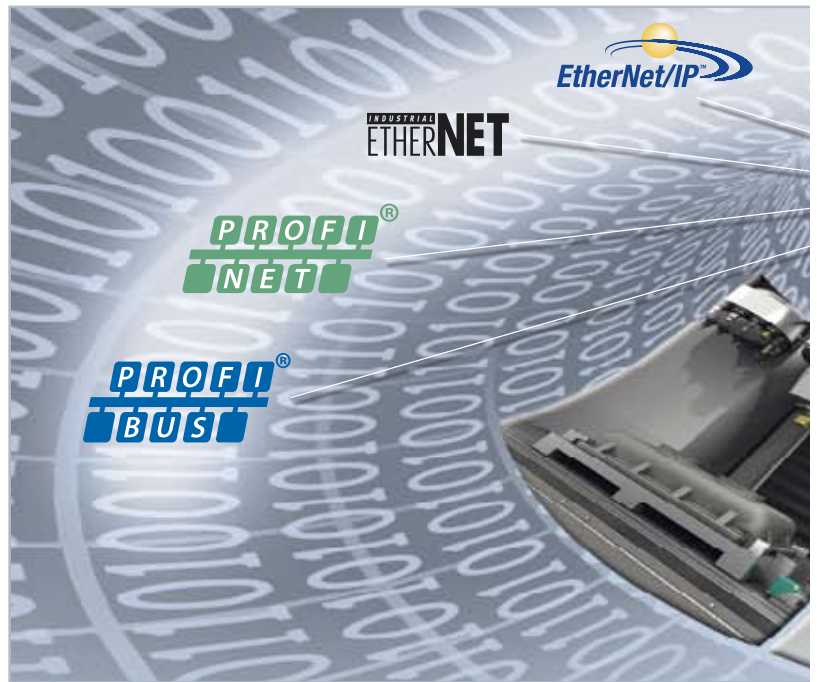


Dr. Peter Adolphs
Management

COMPANY NEWS

20 years of industria

Solutions for every application

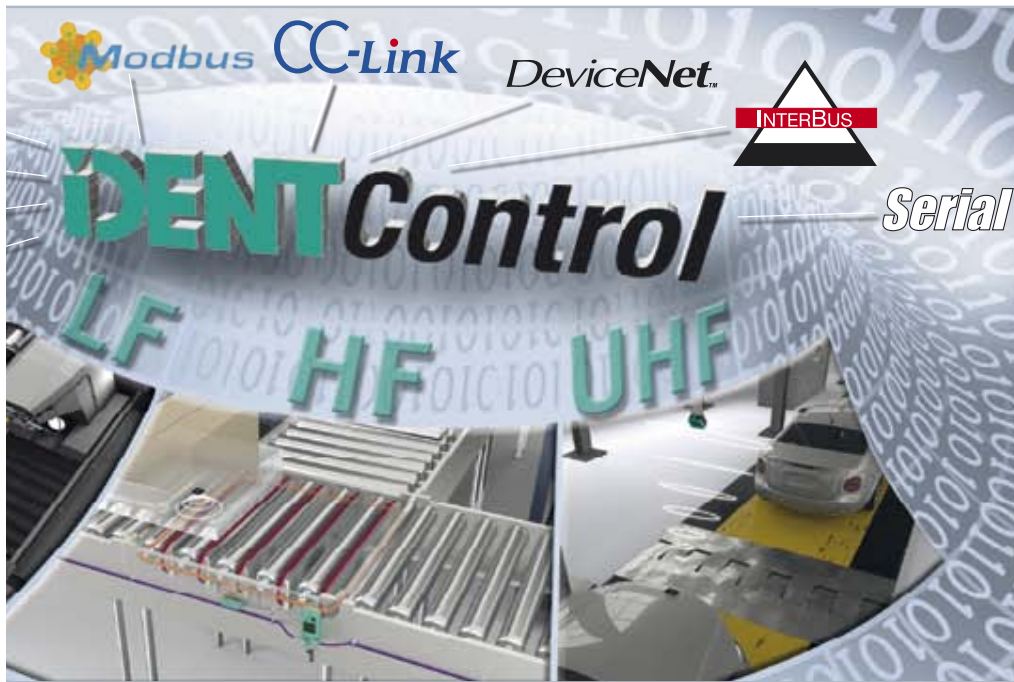


■ Pepperl+Fuchs customers have been using identification technology to optimize their manufacturing processes for two decades. What started with a proprietary RFID system in the LF range for tool identification at CNC machines has evolved into one of the broadest RFID product portfolios on the market thanks to continuous investment.

The IDENTControl system launched by Pepperl+Fuchs in 2004 introduced the combination of different RFID technologies (such as LF, HF, UHF and MW) via the required field bus interface and today is the industry standard.

And yet the original Pepperl+Fuchs identification technology is ahead of the pack in terms of robustness thanks to the powder-coated metal housing with IP67 protection and excellent EMC shielding, the standardized command syntax for all systems, the range of RFID frequencies supported, and the wide selection of reading head designs. Our product quality and experience additionally offer our customers long-term investment security.

IDENTControl RFID from Pepperl+Fuchs



IDENTControl can be used worldwide with all common industrial networks and the IDENTControl interfaces support all RFID systems.



The range of different RFID frequencies is limited. Tags from LF systems with low frequencies can be installed in metal, while systems with higher frequencies offer a better data rate. LF and HF systems work via inductive coupling in the near-field range with a sensing range of typically less than a half meter. UHF systems, on the other hand, tend to work with detached waves in the far-field range and can cover larger sensing ranges of up to several meters. The modularity of the IDENTControl system means that different RFID frequencies can operate simultaneously on the same control interface if necessary, providing the best solution for different applications.

Our systems can even be commissioned without a PC or PLC via the display and direct operation so that the plant function can be tested at an early stage on-site.

Our technical support will be happy to advise you with project planning and assist you with installation or software implementation.

RFID is evolving

We constantly rely on innovation. Our HF system will soon support tags to ISO14443 with twice the data rate. IDENTControl will be extended to include the CC-Link interface, which is important for the Asian market, and will be compatible with Mitsubishi controllers. Pepperl+Fuchs is systematically expanding its know-how in the UHF range to enable it to cover other new fields of application in the future.

Already today there are many industrial processes that are no longer conceivable without RFID support and new ones are being added almost daily. The modularity and technological coverage of the IDENTControl systems from Pepperl+Fuchs offer our customers clear advantages.

WEB INFO

www.pepperl-fuchs.com/fa/news

PRODUCT

Hygienic Design

The challenge of perfection

■ The earth's population will be 7 billion in 2011. The population is increasing by approx. 83 million each year. The worldwide demand for foodstuffs, which have to be produced, stored and distributed, is increasing at the same rate. While in past decades optimization focused on productivity and ensuring sufficient food supplies, today the focus is on shelf life and the associated hygiene. Extending the minimum shelf life increasingly demands hygienic processing and packaging of food products. The latest generation of packaging machines therefore need to adhere to strict hygiene requirements. This calls for ways of cleaning machines efficiently to guarantee microbiological safety. The key word is hygienic design.

The above-mentioned reasons explain why plant builders try to ensure an optimum design for their latest generation of machines from a hygiene point of view. Help is available from specialists such as the EHEDG (European Hygienic Engineering and Design Group), a group that promotes the hygienic design of plant components or the FDA (Food and Drug Administration), an American supervisory authority that approves the materials for the food industry.

With their optimized sensors, component manufacturers such as Pepperl+Fuchs help to complete production plants for the food industry.

Sensors designed from a hygiene point of view have a smooth surface, no edges where dirt might collect or germs could settle, and are designed for wet zones with extreme temperature fluctuations. Before a sensor is approved by Pepperl+Fuchs for use in the food industry, it undergoes tests specifically geared towards these requirements. These tests are much more thorough than required.

All food processing machines have areas that pose different levels of contamination risk: the product-contact zone, the splash zone and the product-free zone. Pepperl+Fuchs has categorized these zones into zone A, B, and C and assigned them properties that a sensor needs to fulfill.

Hygienic sensors are used in the product-contact zone (zone A). This zone must guarantee maximum sterility. In addition to the sensors optimized for this environment, all downstream machine components such as sensor mounts and cable guides, must meet the hygiene guidelines. Shorter cleaning times result in greater machine availability and microbiological safety.

However, there are also areas on machines that do not come into direct contact with the foodstuff, the so-called splash zone (zone B). Components in this zone primarily need to withstand the cleaning cycles and cleaning temperatures.

The installation work can be reduced to a reasonable level, with a positive effect on the costs. Pepperl+Fuchs also offers specially designed sensors for this zone.

The product-free zone (zone C) is noncritical from a microbiological point of view and can be equipped with standard sensors.

If you take all hygiene concerns into account at an early stage when planning a plant, machine components such as sensors and associated mountings with an optimized design can be chosen for each zone.

The cooperation of specialists guarantees an optimum result. That is why Pepperl+Fuchs cooperates closely with the end users, plant builders, cleaning product manufacturers and approval institutes to move ever closer to perfection.

■ PRODUCT

Three technologies used in hygienic design

Sensors for zone A/product-contact zone

■ Ultrasonic metal face sensors (F series), example: UMC3000.

- Designed according to the EHEDG guidelines for hygienic design.
- Consistent avoidance of edges that might collect dirt by combining the mounting solution with the sensor.
- Ultrasonic proximity sensor with metal face.
- Housing material: stainless steel V 4 A (1.4404/316L).
- Smooth housing with surface roughness $R_a < 0.8 \mu\text{m}$.
- Robust and impermeable design to IP68/IP69K, ECOLAB.
- 200 mm ... 3,000 mm sensing range.



■ Photoelectric stainless steel sensors, example: MLE76.

- Sensors with hygienic design according to EHEDG guidelines with certificate, ECOLAB and IP69K.
- Consistent avoidance of edges that might collect dirt by combining the mounting solution with the sensor.
- Highly polished and corrosion-resistant stainless steel housing (1.4404/316L) $R_a < 0.8 \mu\text{m}$.
- Residue-free cleaning thanks to specially shaped housing surfaces.
- Guaranteed impermeability in applications involving steam jets, even with thermal shocks.



■ Inductive metal face sensors (F series).

- Designed according to EHEDG guidelines.
- Consistent avoidance of edges that might collect by combining the mounting solution with the sensor.
- V 4 A stainless steel solid metal housing (316L/1.4404).
- High impermeability in hot and humid environments (IP68/69K) $R_a < 0.8 \mu\text{m}$.
- Designs with 12 mm and 18 mm smooth housing as well as thread versions.
- Temperature range -25 °C ... +85 °C.



■ WEB INFO

www.pepperl-fuchs.com/fa/news

PRODUCT

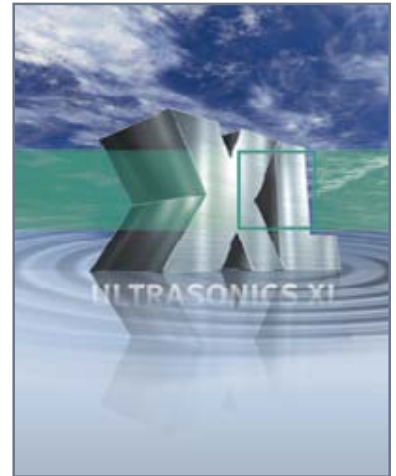
Immune to glare

Ultrasonics XL - Noncontact object detection in automation technology

Brightly colored shiny metallic packages magically catch our attention. Problems arise if these parts need to be detected during production. Ultrasonic sensors offer a built-in advantage: they are immune to glare.

Ultrasonic sensors have an undeniable advantage: they can detect objects with millimeter precision regardless of color and reflection characteristics. In addition, dirt and dust do not have a negative effect. These advantages can be simply explained by the measuring principle: short ultrasonic pulses are emitted in cycles and the echo propagation time evaluated. The propagation time, which is proportional to the object distance, is precisely measured using a microprocessor. The intensity of the reflected signal is not relevant for the measurement. Despite these advantages, ultrasonic sensors were previously considered too big and their operation too complicated.

We offer the right ultrasonic sensor for every application. With sensing ranges from a few centimeters to 10 meters and models with simple pushbutton programming to very specific adjustments using intuitive parameterization tools, we offer the right ultrasonic sensor for your application.



WEB INFO

www.pepperl-fuchs.com/fa/news

APPLICATION

Up high

F99 inclination sensor for aerial work platforms

Reliable aerial work platforms are needed to maintain machines and plants at extreme heights.

With the WT1000 aerial work platform, Palfinger Platforms GmbH has the biggest all-terrain aerial work platform in the world, which has been specifically developed for installing and servicing wind turbines. With its extreme working height of more than 100 m, it can reach heights that cannot be accessed using conventional aerial work platforms.

Palfinger relies on reliable inclination sensors from the F99 series from Pepperl+Fuchs. They record the exact position of the arm system on the aerial work platform so that maneuverability and stability are always guaranteed. The angle measurement range can be selected between 0° and 360° and was set to 120° and 180° for the Palfinger Platforms aerial work platforms and fitted with a low-pass filter.

The F99 inclination sensor is easy to install with the integrated mounting concept and takes up little space. However the main benefit to Palfinger Platforms is the noncontacting measurement process of the inclination sensors from Pepperl+Fuchs, since these are maintenance and wear-free.



F99 series inclination sensors from Pepperl+Fuchs ensure accurate position detection and leveling of the arm system on aerial work platforms.

WEB INFO

www.pepperl-fuchs.com/fa/applications

PRODUCT

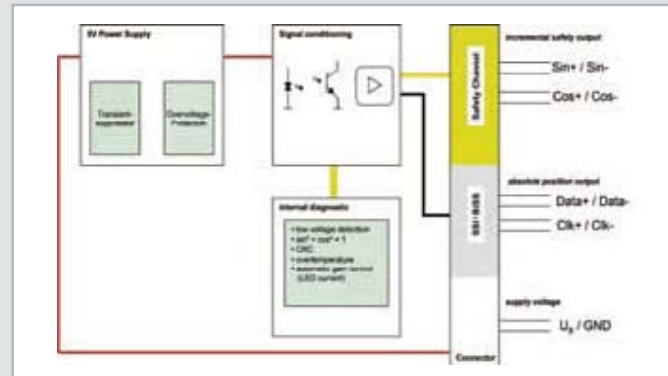
Simply safe

New addition to the safety rotary encoders

Pepperl+Fuchs is extending its product portfolio in the area of safety rotary encoders to include a commutation encoder suitable for use in synchronous motors. It can be used up to SIL3 or up to performance level e.

The safety concept of the sensor is based on an ASIC, which is responsible for both signal conditioning and for self-diagnosis. The electronics evaluate the incremental encoder signals and detect faults in the signal path. The ASIC monitors the supply voltage, temperature, LED activation and checksum of the calibration data. If a fault occurs, the integrated electronics switch the encoder outputs to high impedance. This means that the fault can be detected via lead breakage detection. A reset is performed by switching the rotary encoder's supply voltage off and on again.

The rotary encoder has a high-resolution incremental track with 1024 periods per revolution and a sine/cosine absolute track with one pe-



Block diagram for functionally safe motor feedback rotary encoder.

riod per revolution. This provides information on the precise rotor position of the motor, which is required for start commutation in the case of synchronous motors. The absolute value is present on the output side as a digitized signal and can be called up via the SSI or BiSS protocol.

WEB INFO

www.pepperl-fuchs.com/fa/news

PRODUCT

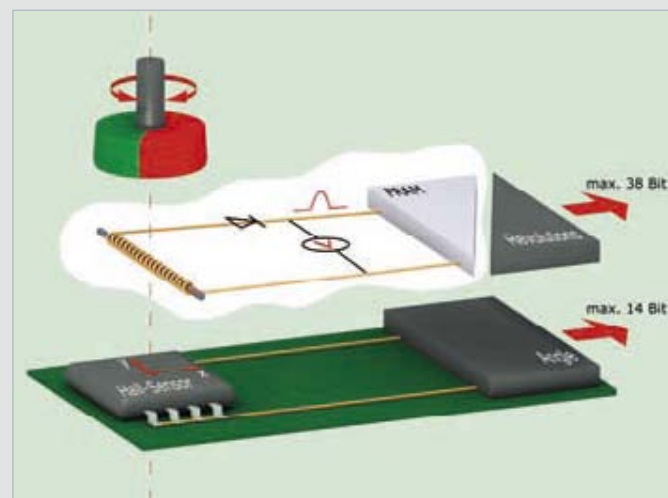
High accuracy meets robustness

Magnetic absolute encoders

The new absolute encoders from Pepperl+Fuchs are characterized by the use of innovative technologies and can be used in applications that could not previously be realized using optical absolute encoders due to mechatronic restrictions. The absolute encoders use Wiegand technology as a model for the multiturn functionality. This technology does not use any batteries and is therefore maintenance-free. The use of magnet technology enables the rotary encoders to have a more robust design. High and low temperatures, moisture, and vibrations do not impair the functionality of the absolute rotary encoders.

Higher bearing loads can be absorbed, which helps to improve the service life of the overall unit. In addition to the standard rotary encoders, rotary encoders with special features for especially high mechanical loads are also available.

The new absolute encoder is an alternative to optical encoders and offers undeniable advantages in certain applications.



Function principle of magnetic encoders.

WEB INFO

www.pepperl-fuchs.com/fa/news

PRODUCT

Even better: sensing by ranging

Far-reaching improvements in performance with distance sensors

PRT sensors have already proven themselves thousands of times over in the most different of applications. One of the major advantages of Pulse Ranging Technology is the high sensing range that can be achieved. It makes it possible to measure ranges up to 500 m without restricting sensor accuracy. The VDM100 distance measurement



Optical distance measurement using the VDM28 eye-safe distance sensor.

sensor now measures up to 500 m using reflectors and the VDM28 series universal distance sensors measure up to 15 m on diffuse reflective surfaces.

The large measuring range and the new variants with the eye-safe Laser Class 1 make the VDM28 series sensors even more universal and pave the way for other applications, including outside of industrial automation. It is not necessary to take any safety precautions in areas where people congregate when using lasers from Laser Class 1. High precision, reliable cross-talk protection, and extremely high resistance to environmental influences such as ambient light make these sensors unique.

WEB INFO

www.pepperl-fuchs.com/fa/news

PRODUCT

Many considerations for a new light grid

For a wide range of applications - from detection to identification

The new LGS automation light grid series detects objects ranging in size from small to large. The very slender light grids have a modular design and come in different beam spacings and field heights from 100 mm to 3,200 mm. All signal evaluation takes place inside the unit. The lightweight systems can be integrated in their surroundings in a well-designed configuration, which means that machines and plants in temperature ranges between -30 °C ... +60 °C can be designed more compactly.



The low-cost light grid is extremely flexible to use, whether in standard or special applications.

Commissioning and operation is no more complicated than with conventional photoelectric sensors. The transmitter and receiver are correctly positioned opposite each other and the two units are connected electrically. The required properties can be set without software directly on the unit with a pushbutton.

Different objects can be taught in with just one press of a button for height checking applications. A super-fast response time in spite of a triple beam configuration helps in the overhang detection applications. A special feature is the possibility for object identification by teaching the light grid to recognize objects. This enables different parts to be detected and identified. The optional IO-Link command interface offers further options for efficient use of the light grids. Apart from setting the default parameters, it can also be used to define further heights or create object libraries.

WEB INFO

www.pepperl-fuchs.com/fa/news

■ PRODUCT

Senses for robots

High-precision gap dimensions in the automotive industry

■ Automotive production without robots? Inconceivable! Robotic devices carry out many processes in the body, paint and assembly shops as well as in other areas. This work could not be carried out, or at least not with the necessary precision, without suitable sensors.

A typical example is door assembly. The parts provided are taken from a rack using special grippers and must be positioned with sub-millimeter precision before being bolted together. Factors such as the geometry and position of the door as well as of the body influence the process.

High-precision optical sensors that determine the position of the door relative to the chassis at critical measurement points are needed for the required installation accuracy. The LineRunner300 (LR300) measuring laser light sensor from Pepperl+Fuchs with its design based on the triangulation principle is ideally suited to this application. Its compact dimensions enable this sensor to be ideally integrated into a robotic gripper application. In this case it is vital to use the values measured by the sensor for the purpose of intelligent robot control. Specialists from VMT Bildverarbeitungssysteme GmbH, a company in the Pepperl+Fuchs Group, have developed and continuously improved the VMT RP control system in close cooperation with the automotive industry. The system based on the best-fit principle continuously measures the relative position of the door to the body and keeps correcting the robot position until the measured values of the sensor indicate the optimum installation position.

The principle of controlled robot positioning has major advantages:

- Fast and highly accurate positioning thanks to continuously measuring sensors.
- Best-fit mounting, even with workpiece and positioning tolerances.
- If required, dynamic tracking of a moving workpiece.

The VMT RP best-fit system offers consistently high production quality (even with aging of components and form tolerances), reduced cycle times, and complete process control and documentation. The software is easy and intuitive to use. It runs on a standard industrial PC. The system is commonly installed in its own control cabinet and supports all major robot manufacturers, controllers, and bus systems.



LR300 dual heads ensure installation accuracy.

Best-fit systems from VMT are in use in over 100 plants today. A leading German premium car manufacturer uses VMT RP as a standard system for door and hood assembly. Further positioning tasks, for example in the area of window, roof and module assembly, are realized in the assembly shop. The LR300 sensor has proven itself particularly useful when it comes to the assembly of painted components thanks to its robust measuring principle and the integrated data processing.

■ LineRunner LR300 - features

- High-accuracy 3D measurement as a system component.
- Accurate measurement even with different object and background colors.
- Immunity to extraneous light.
- Laser protection Class 1 does away with complex protective measures.

■ WEB INFO

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PRODUCT

A crucial USP

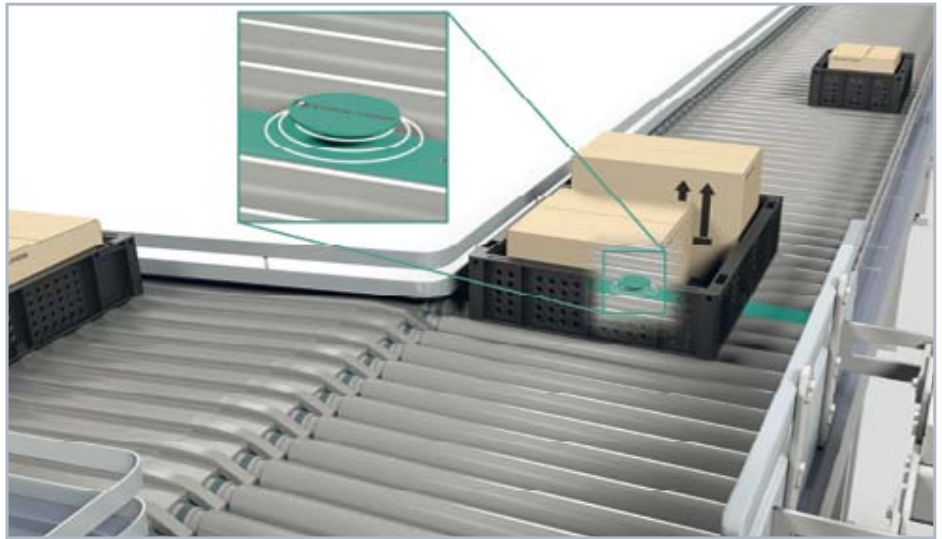
RFID innovation for conveyor technology

■ The new 54-centimeter RFID reading head has a continuous read range along its entire length with a uniform reading distance of 65 mm. It is connected to the IDENTControl interface and can be joined to the control system via all common industrial networks. It works as an LF system, which means that it can work even when mounted directly on metal or between metal parts. The low height of just 15 mm is an advantage here, as are the mounting holes inset in the reading head.

If the reading head is mounted perpendicular to the direction of movement, it offers very large tolerances for the tag position. This means that in conveyor systems poorly positioned containers can always be read using tags, regardless of their position. In the past, additional guide elements had to be included for precise positioning; these elements are now no longer needed.

If the reading head is mounted parallel to the direction of movement and the tag position is precisely defined to within a few centimeters, data can be read from the tag at travel speeds of up to 10 m/s. To this end, the tag is in the reading range for a long distance and therefore a longer time.

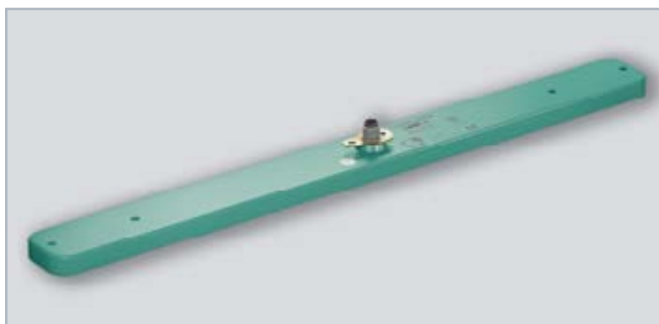
The reading head fits perfectly in roller conveyor systems, since its width of just 50 mm means it can be easily positioned between the



RFID = IDENTControl-System - high speed and wide range.

metal rollers. This is a crucial USP. Interference sources such as frequency converters and powerful motors often cannot be avoided in these applications. The special shielding concept with connection to the system ground guarantees optimum EMC characteristics and ensures stable and secure data transmission.

Another great RFID innovation from Pepperl+Fuchs, that solves two typical applications in conveyor technology with a single product.



Long RFID reading head F97 with homogeneous reading range along its entire length.

WEB INFO

www.pepperl-fuchs.com/fa/news

■ PRODUCT

Precise digitization of analog data

The AS-Interface G11 analog module with IP68/69K

■ The G11 series is setting new standards in degree of protection, robustness and flexibility. The module offers protection to IP68/69K and is completely pluggable. It supports analog values for voltage (0 V ... 10 V), current (0/4 mA ... 20 mA) and PT100 resistances (-200 °C ... +850 °C) in one unit. The two analog channels are even assigned automatically. It could not be easier or more flexible. The latest process technology converts the analog values into digital data with 16-bit resolution with greater speed and precision. The benefit for you: 30 % faster compared to current solutions and a wide temperature range of -25 °C ... +70 °C with a drift of just 20 ppm per °C. That is a new record.

Very good EMC characteristics, an integrated shielded connection concept for the system ground and the line filter option offer reliable functionality with high availability. An easy, reliable, quick, and extremely precise way of transmitting analog control data to your controller via AS-Interface.



G11 AS-i analog module – just the thing

■ WEB INFO

www.pepperl-fuchs.com/fa/news

■ ENCYCLOPAEDIA

Together on the path to perfection

■ The European Hygienic Engineering & Design Group (EHEDG) is a community of experts made up of machine and component manufacturers as well as specialists from the food industry, research institutes, and health authorities. The organization was established in 1989 with the intention of raising the awareness of hygiene in the processing and packaging of foods.

The principal task of the EHEDG is to contribute to the hygienic construction and design in all sectors of food production and guarantee safe manufacture of food products.

The EHEDG enjoys general recognition beyond European borders. Their guidelines are used around the world as a basis and orientation for new machine generations from plant builders in the food industry.

Together with the EHEDG, our end customers, and plant and component manufacturers, Pepperl+Fuchs is working on practical solutions for the future that ensure microbiological safety and hygiene in the production and packaging of food products.



■ WEB INFO

www.pepperl-fuchs.com/fa/news

PRODUCT

Electronic cam switch controllers

Positioning at the highest level

The ideal alternative to cumbersome mechanical solutions: the robust electronic cam switch controller.

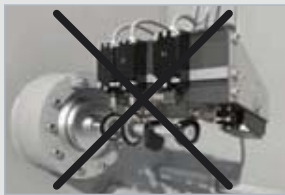
Cam switch controllers control machine positions so that all process sequences can run smoothly. With mechanical cam switch controllers, the cams are lined up on a shaft and meticulously aligned. Since each cam can only generate one switching point, this increases the mounting complexity as well as the space required.

The alternative: the PMI360DV angle sensor with

three freely adjustable switching points. The benefits speak for themselves: no wear and a smaller mechanism, that's faster to install and easier to use. If additional switching points are required, the PMI360DV sensor can be used in combination with the PAX unit. This provides 14 switching points and 6 more analog outputs. The PAX system also saves each parameter setting on a Micro SD card, which means they can be duplicated or quickly replaced without any problems.

WEB INFO

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Positioning at the highest level: the PAX system.



PMI360DV... the smallest, most compact and simplest robust electronic cam switch controller around.

PRODUCT

Good vibrations

Acceleration sensors in wind power

Machines and plants are often subject to severe vibration wherever physical forces and forces of nature are at work and machine components are turning or moving.

Accurate monitoring of functional states is becoming increasingly important with complex machine systems in order to identify critical states early and, if necessary, take protective measures. On tall buildings such as wind turbines, high winds not only jeopardize safe operation but also pose a serious risk to the expensive system components. Monitoring of the load conditions is vital in order to protect the investment and maintain operational reliability. With its robust housing suitable for outdoor use to IP68/69K and non-contact measuring principle, the new F99

acceleration sensor is ideally suited to applications ranging from machine and commercial vehicle monitoring to wind turbines. Depending on the version, the sensors detect acceleration from $-2 g \dots +2 g$ in the frequency range from 0 Hz ... 100 Hz. The measured value on one or two axes is supplied as an analog signal with a resolution $\leq 5 \text{ mg}$. Other highlights include the high immunity of 100 V/m, the extended temperature range of $-40 \text{ }^\circ\text{C} \dots +85 \text{ }^\circ\text{C}$ as well as the e1 type approval.



F99 acceleration sensor - housed in a metal enclosure.

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EVENT

Hannover Messe
04.04. – 08.04.2011

CeMAT, Hannover
02.05. – 06.05.2011

Interpack, Düsseldorf
12.05. – 18.05.2011

Motek, Stuttgart
10.10. – 13.10.2011

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