



**PEPPERL+FUCHS**  
SENSING YOUR NEEDS

# NEWS FOR FACTORY AUTOMATION

Edition 2/2013

## With Excellent Precision and Robustness

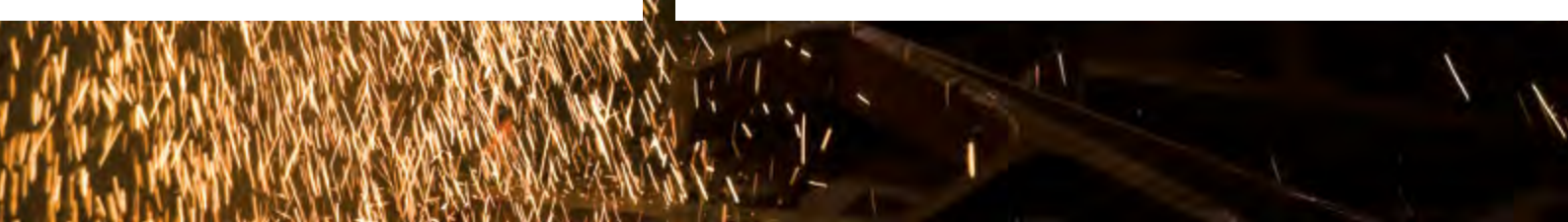
*The new generation of magnetic rotary encoders  
opens up completely new possibilities for use*

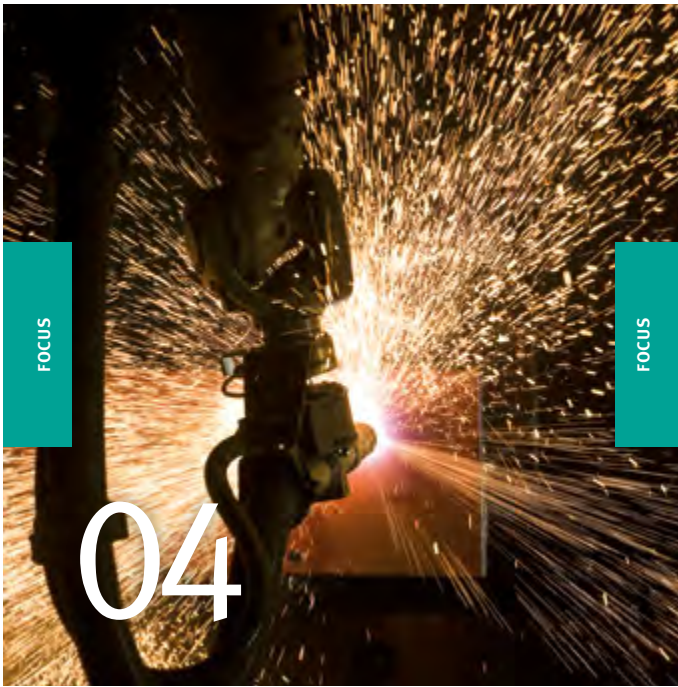
### Industry 4.0

*How Web technologies will result in lasting changes to automation*

### Smart Farming Gaining Ground

*Ultrasonic sensors for efficient processes in agriculture*





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**Applications + Knowledge**

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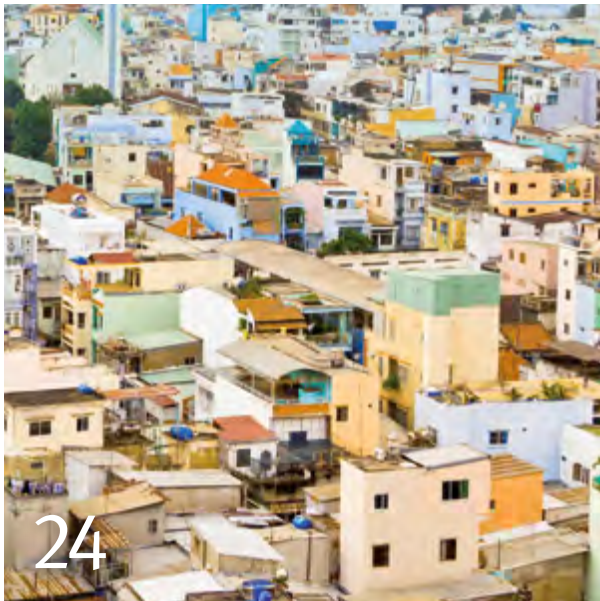
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# Dear reader,

More than 250 years have passed since the invention of the steam engine heralded the first industrial revolution. Nowadays, it is the Internet that plays the pivotal role when it comes to serious technological upheavals. Industry 4.0, which encompasses complete, automatically controlled networking of machines and plants using Web technologies, is one of the key issues facing the industry in the future. The idea, for example, that all the stages of a production process – including the products themselves – could autonomously control and optimize an entire factory suggests that the radical changes that this revolution brings will define industry to a similarly considerable extent as the three previous industrial revolutions. Find out what Industry 4.0 means for the industry and for Pepperl+Fuchs beginning on page 18.

Read our cover story to find out how the new generation of magnetic rotary encoders is opening up entirely new possibilities for use in machine and plant engineering. These encoders redefine the limits of what can technically be achieved with extreme precision and robustness, and ensure improved process safety and efficiency in any industrial environment.

Happy reading,

**Dr. Gunther Kegel**  
CEO

We look forward to your feedback on the new layout and the contents of this issue: [newsletter@pepperl-fuchs.com](mailto:newsletter@pepperl-fuchs.com)

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# The New Generation of Magnetic Rotary Encoders

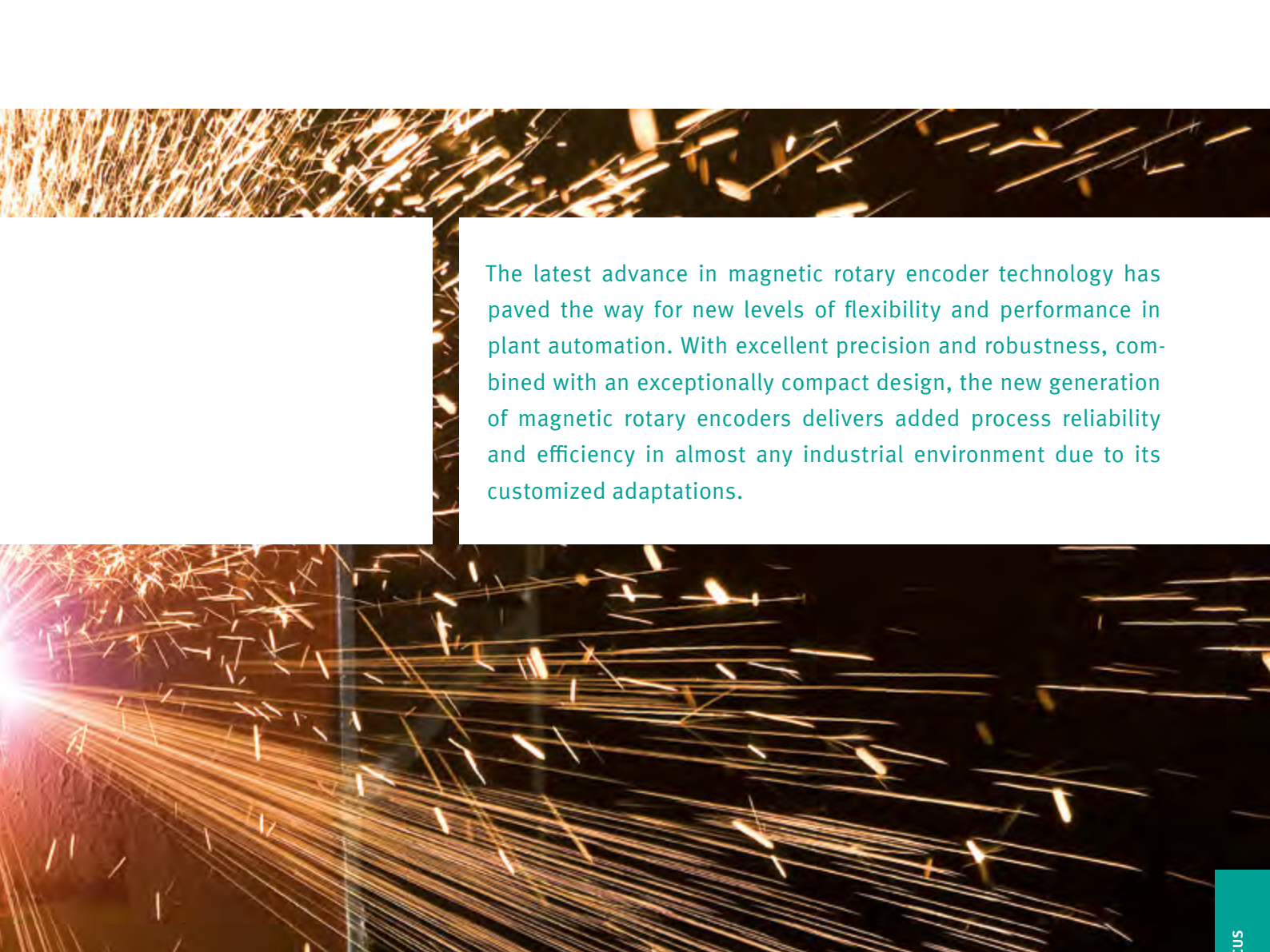
**P**ositioning tasks in general machine engineering primarily call for a high degree of accuracy, along with high resolution and dynamics. Previous solutions based on magnetic absolute rotary encoders provide accuracies of approx.  $1^\circ$  and a maximum resolution of 12 bit. The dynamic response, in terms of the cycle times, is more than  $600 \mu\text{s}$ . For this reason, applications with stringent accuracy and dynamic requirements predominantly use optical rotary encoders. However, difficult ambient conditions such as dirt, vibrations, or extreme temperatures present major challenges for this rotary encoder technology.

## IN BRIEF: SOPHISTICATED MAGNETIC FIELD TECHNOLOGY – FROM SINGLETURN TO MULTITURN



Absolute rotary encoders based on a magnetic detection principle use a two-axis Hall sensor. A rotating magnetic field generates a sine or cosine signal. This signal is processed via the internal processor, generating an output signal equivalent to the output signals that can be obtained from optical scanning techniques. This enables uniquely compact singleturn absolute rotary encoders to be created in small construction volumes.

An additional Wiegand sensor converts them into multiturn absolute rotary encoders. A permanent magnetic field rotating above the Wiegand sensor generates a reversal of the magnetic field direction in the core of the sensor. The noncontact and wear-free Wiegand sensor makes a major contribution to increasing reliability, while simultaneously reducing maintenance and service work.



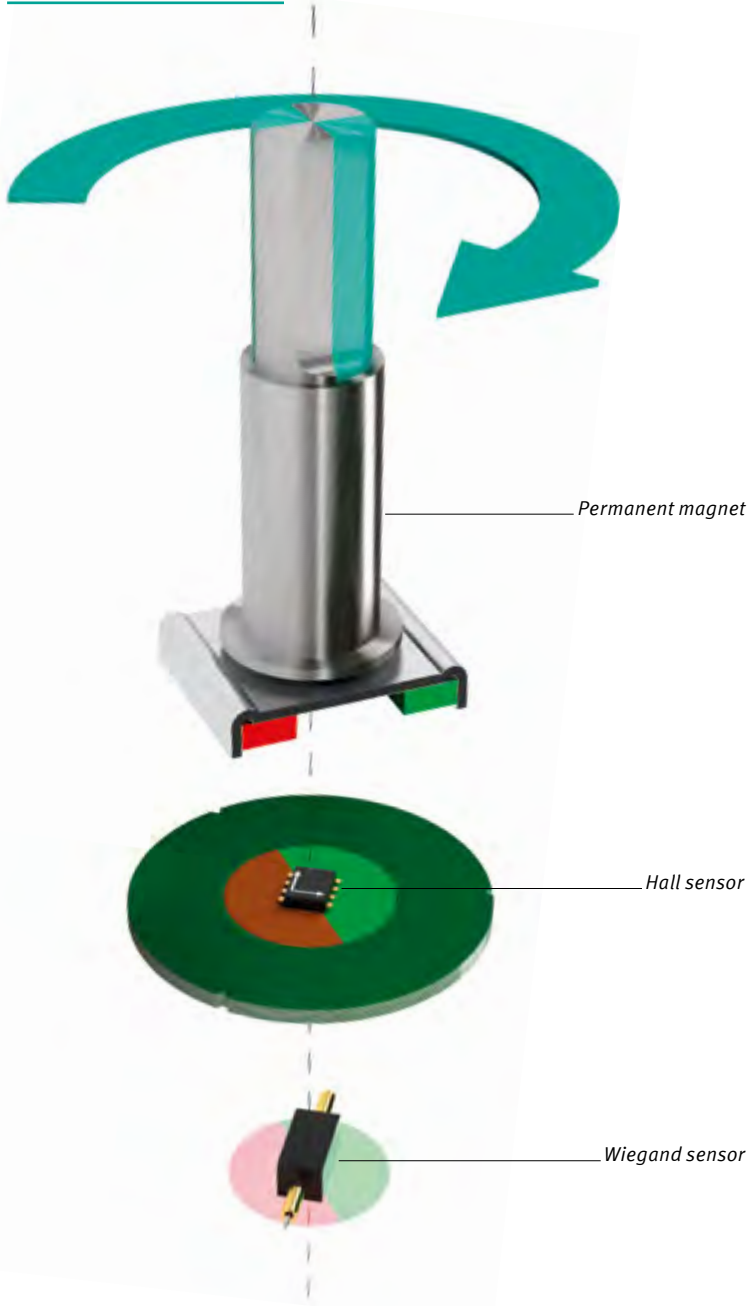
The latest advance in magnetic rotary encoder technology has paved the way for new levels of flexibility and performance in plant automation. With excellent precision and robustness, combined with an exceptionally compact design, the new generation of magnetic rotary encoders delivers added process reliability and efficiency in almost any industrial environment due to its customized adaptations.

### Redefining Boundaries

With the latest developments in magnetic rotary encoders, Pepperl+Fuchs is redefining the limits of what can technically be achieved by combining the high precision and dynamics of optical rotary encoders with the added benefits delivered by magnetic rotary encoders – exceptional robustness and compactness. Accurate to a level of  $0.1^\circ$ , and with a resolution of up to 16 bit and a cycle time of  $<100 \mu\text{s}$ , they give users a whole new level of flexibility and performance.

The critical benefit of magnetic rotary encoder technology is that it uses a noncontact detection principle that is not subject to wear and therefore incurs no maintenance or service costs. It is unaffected by environmental influences and delivers reliable measured values. >>





[www.pepperl-fuchs.com/magnetic-technology](http://www.pepperl-fuchs.com/magnetic-technology)

» **Maximum Performance**

In the future, with the magnetic absolute rotary encoders with accuracies of up to 0.1°, Pepperl+Fuchs will be able to offer rotary encoder technology that opens up new horizons in general machine engineering and plant automation. The precise, high-performance magnetic rotary encoders increase production reliability even in tough industrial environments, because the magnetic technology reduces maintenance and service requirements to practically zero and extends the encoders' service life even when exposed to dust, contamination, and extreme temperatures. Furthermore, magnetic absolute rotary encoders open up new possibilities for use in applications where compact dimensions are a critical factor. +

# Room for Gro



Matthias Padelt, Managing Director  
Pepperl+Fuchs Drehgeber GmbH

*Twice as much room, optimum working conditions, and plenty of extra space, both within the building and on the site: the course is set for growth. On July 1, 2013, Pepperl+Fuchs Drehgeber GmbH moved into its new location in the industrial park at Neuhausen ob Eck, Germany. Managing Director Matthias Padelt tells us about the move and the outlook for the new site.*

# wth and Expertise

## Mr. Padelt, what were the crucial factors in the relocation?

Since Pepperl+Fuchs took over Hohner Elektrotechnik back in 1996, our sales have increased sixfold. Over the years, we have massively expanded production and created new jobs, and we had reached the full physical capacity of our old site. You hardly had room to turn around when you were working there. There was simply no more space on our old site and we were unable to find a suitable location in Tuttlingen itself. But we have only moved seven kilometers away.

## Did you consider moving to a region with lower labor costs?

No, this option was not up for discussion. Our greatest strengths are our expertise and our highly qualified employees, who have strong roots here. Local suppliers speak our language and are excellent partners. The move actually strengthened our links to the location, as rather than renting a building, our parent company Pepperl+Fuchs has invested a lot of money in buying a site with plenty of extra space. Given the ideal conditions here, we can concentrate fully on our long-term strategy.



*The new rotary encoder production hall*

**“THE KEY ISSUES ARE CUSTOMER-SPECIFIC SERVICE AT COMPETITIVE PRICES, QUALITY, TECHNOLOGY, AND INNOVATION.”**

## What does your strategy look like?

We have big plans. Of course we want to grow and gain market share – most companies want to do that! But we can see some major opportunities in particular areas and we are following clearly defined objectives. For example, Pepperl+Fuchs Drehgeber GmbH has traditionally had a strong presence in the plant automation and wind energy sectors, but we tend to be under-represented in other areas, such as the oil and gas industry, and chemicals. We have already shown that things don't have to remain that way, and one of the world's largest manufacturers of crude oil production systems is now one of our customers. This is an industry with extremely strict requirements for robustness and safety, and our products and expertise have a great deal to offer.

## How are you planning to impress potential new customers?

I believe there are a range of convincing arguments in our favor. The key issues are customer-specific service at competitive prices, quality, technology, and innovation.

## What do technology and innovation mean to you?

With the new generation of magnetic rotary encoders, we are offering our customers a genuine technological highlight. They deliver impressive accuracy of 0.1° and the robustness of the magnetic detection principle means that they are suitable for use in even the toughest conditions. The fact that the new magnetic rotary encoders offer ten times higher accuracy and precision allows them to be used in applications that would previously have been impossible.

When it comes to optical rotary encoders, we have expertise across the full range of technology, we are continuously developing it, and can respond immediately when new opportunities arise. We have big plans in all areas of our business, and our new site puts us in a great position to achieve great things. +

# A Distance Ahead with Innovative

***A new generation of photoelectric sensors with distance measurement core technology is the key to solving many of the typical issues that designers and operators of machines and plants have to face on a daily basis.***

Whether the problem involves changing ambient light situations, strong reflections, or interfering objects in the foreground or background, the new photoelectric sensors from Pepperl+Fuchs feature state-of-the-art measuring technology to prevent incorrect switching, extend the range of possible functions, and give the user a crucial technological advantage when it comes to performance and flexibility.

## **From Near to Far**

The products equipped with this innovative measuring technology are designed for multipixel technology (MPT) and pulse ranging technology (PRT) optical detection methods. Multipixel technology is primarily used for shorter distances, while in pulse ranging technology the focus is on sensors with medium-to-long ranges of several hundred meters. The sensor electronics use the distance information for object detection. Combined with intelligent evaluation methods,

these photoelectric sensors offer a level of quality and performance in object detection and distance measurement that has never been seen before. Whether within the near range or at longer distances, MPT and PRT stand for maximum precision and detection reliability.

## **MPT for Reliable Object Detection in the Near Range**

One thing that is notable is that simple standard sensors benefit fully from these technical advances. They offer impressive flexibility and versatility, i.e., the configurable measuring core means that a single device can deal effortlessly with various challenging tasks.



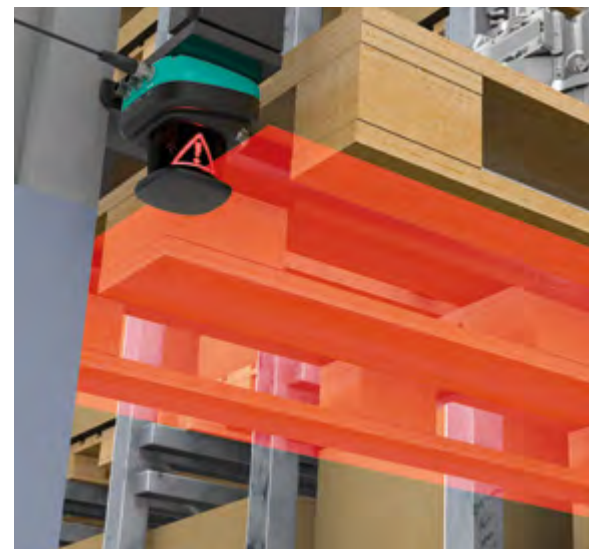
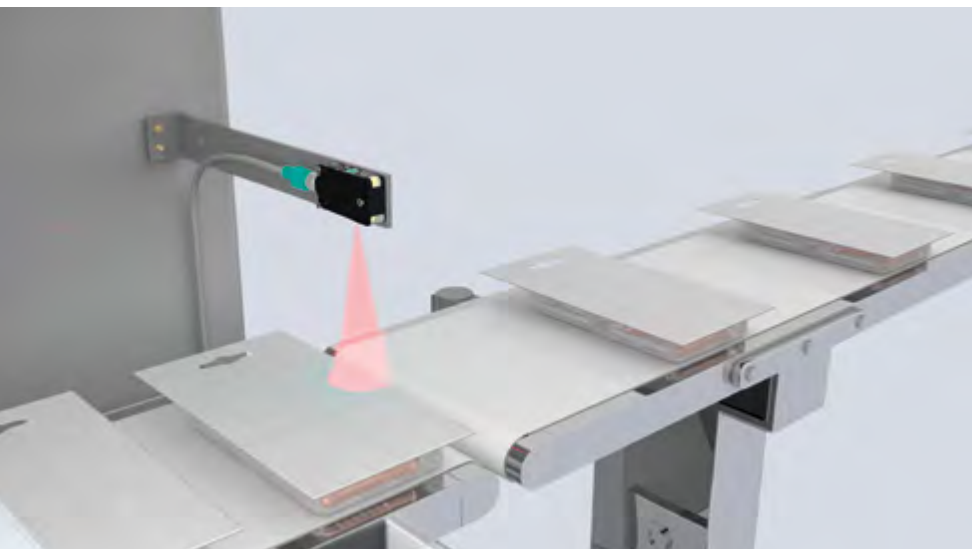
### **IN BRIEF: MULTIPIXEL TECHNOLOGY**



Multipixel technology uses the tried-and-tested triangulation principle and combines it with the measuring functions of distance sensors. Target objects are clearly differentiated from the background, while adjustable operating modes allow interfering objects in the foreground or background to be reliably suppressed. No other technology provides greater reliability for short-distance applications.

*With a choice of four different operating modes, the MLV41-8-H Series ensures flexibility in any application.*

*The R2000 delivers a continuous 360° all-round view.*





# Measuring Cores

Even with the compact MPT sensors from the MLV41-8-H and RL31-8-H Series, users can configure four different operating modes – background suppression, background evaluation, window mode, and a hysteresis mode. They cover detection and measuring ranges between 20 mm and 800 mm and are equipped with IO-Link interfaces.

## PRT – The Turbocharged Solution

On sensors for medium and long distances, pulse ranging technology acts as a kind of innovative “turbocharger” that enables devices to achieve an unprecedented precision and detection range. The VDM28 is a distance sensor that combines precision and immunity to extraneous light and interaction with high resistance to environmental influences. Depending on the model, detection ranges of up to 8 m, 15 m to object surfaces, or up to 50 m to a reflector are supported.

A new development with pulse ranging technology is the R2000 2-D laser scanner. It delivers a continuous all-round view across an angle of 360° and is perfect



for use as a mobile sensor on automated guided vehicles, where it can perform collision prevention tasks or navigate in logistics areas. In addition to these conventional applications, the high angle and distance resolution opens up a range of innovative applications, e.g., in building automation,

surveillance technology, and many other areas.

And that’s not all. New technological solutions enable PRT to be used in a huge number of other products and applications, with the first examples set to be launched later this year. +



[www.pepperl-fuchs.com/a-distance-ahead](http://www.pepperl-fuchs.com/a-distance-ahead)



### IN BRIEF: PULSE RANGING TECHNOLOGY

Pulse ranging technology is an innovative method that precisely captures distances of a few centimeters to several hundred meters using a direct measuring method. PRT is an innovative development of pulse propagation time measurement and is a genuine light propagation time method. PRT allows precise, reliable, and unambiguous measurements with an excellent repeatability and short response times, regardless of the ambient or object conditions.

*The VDM28 distance sensor used for a compartment-occupied check and precise positioning of stock feeders.*

*Thanks to their configurable measuring core, the RL31-8-H MPT sensors can cope effortlessly with almost any challenge.*



# Smart Combination

**Positioning Systems** *Optical color band tracking for driving, Data Matrix codes for positioning, control codes for navigation: the PGV positioning system is the only product that offers this combination, making it the best solution for positioning automated guided vehicles.*

With the camera system's powerful, integrated signal processing, the speed, the X and Y position, and the angle are precisely detected at all times and are continuously reported. The large reading window can even cope with tight curves, with exact position feedback at all times.

## Uniquely Insensitive

The revolutionary camera technology makes it totally insensitive to ambient light. Dirt or damage to the color band or the codes cannot affect the PGV either. Shiny floors, changing ambient light, and strong light reflections interfere with conventional optical positioning

systems as they do not have a balanced selection of aperture, lens, and shutter speed. On the new PGV positioning system, the optical components are solely focused on the "region of interest" and the aperture and shutter speed selected are coordinated with optimum lighting. This makes overexposure physically impossible, and means that the ambient light cannot impair the reading performance. The color band for route tracking, for which any width and color can be selected, no longer has to be optically differentiated from the floor covering with contrast bands.

## Reliable Processes in All Areas

With its superior hardware and software, the PGV delivers excellent process reliability, flexible handling, and cost efficiency. The integrated universal interface for all standard fieldbuses and process control systems gives the positioning system plug-and-play connectivity. In short, it is the perfect solution for automated guided vehicles in intralogistics, material handling, the automotive industry, the print and paper industry, health care, and many other areas.



# Measurements in Millimeters

**Light Grids** Pepperl+Fuchs is expanding its range of automation light grids to include the LGM Series – the new measuring light grids. These light grids deliver their results directly in millimeters via an IO-Link interface and relieve the user from performing complex single-beam evaluations for standard tasks.

The LGM Series light barriers consist of an emitter strip and a receiver strip with IP67 protection and cover a rectangular detection area of infrared beams. The modular systems allow field heights of up to 3,200 mm and are available with 8 mm, 17 mm, 25 mm, and 50 mm beam gaps; a beam crossover can be connected. The user selects the optimum mode from 16 predefined evaluation methods for measured values, such as the object height, lowest or highest object position, sum, or average.

## Transmitting the Measured Values via IO-Link

The connections to the controller are established via IO-Link. In addition to digitally transmitting the millimeter measured values with a cycle time of 2.3 ms, the interface enables convenient commissioning and maintenance from the control level. The parameterization and remote configuration of the light grids can also be carried out via a PC. In addition, IO-Link retains backward compatibility with the conventional switching output.

## Compact Design

The LGM light grids in compact aluminum profiles with a cross-section of just 20 mm x 30 mm are a refreshing change from the numerous large models on the market and set new standards in terms of functionality and price-performance ratio.



# Small, but Making a Big Splash

**RFID** When using UHF technology for identification, a distance of one to two meters between the read/write head and the tag is often perfectly sufficient for practical applications.

The new F190 UHF read/write head was developed for precisely these distances. As a small antenna is sufficient at this range, the robust housing is exceptionally compact. Furthermore, the F190 brings a major increase in efficiency – it can read up to 40 tags simultaneously, thus considerably reducing cycle times in plant automation or intralogistics.

## Multitag Reading

In intralogistics, for example for picking in high-bay warehouses, multitag reading guarantees reliable identification of all data in a single reading and transfers the data to the control unit. When used in transportation for truck access control, the F190 ensures smooth and fast processes.

The new F190 UHF read/write head also delivers an impressive performance in the automotive industry, for example, for multitag reading of painted car parts. The workpiece to be painted is initially

identified individually along the painting line with a high-temperature tag. Several body components are then usually secured on a rack. When the rack is driven to the next processing stage through a gate on a forklift, all the tags can be detected in a single read and transferred to the central production control system.

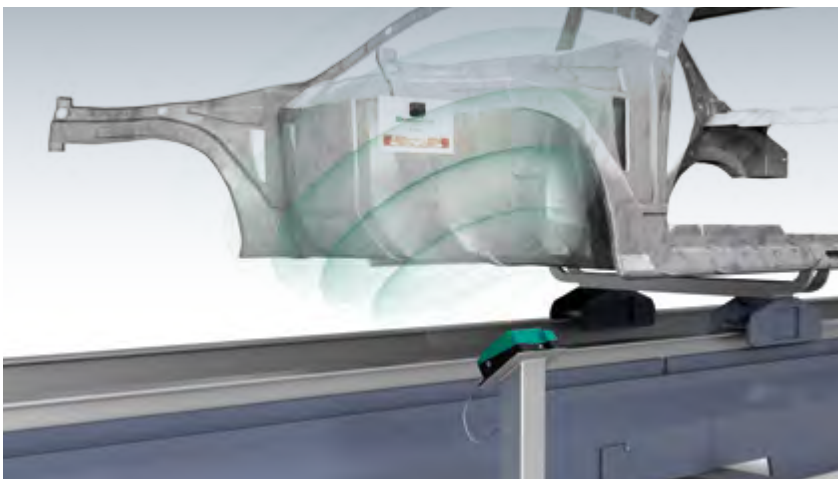
## Robust and Flexible

The F190 is designed for tough ambient conditions. A sturdy metal housing with encapsulated electronics makes it largely insensitive to external influences. With dimensions of just 11 cm x 11 cm, the compact UHF read/write head is easy to install. It automatically optimizes the transmission power and frequency bands during the reading process, thus guaranteeing the best possible reading.

Following the successful launch in Europe, the versions for the American and Asian markets have been announced for the first quarter of 2014, and we expect this small device to make a huge impact there, too.



*The F190 UHF read/write head increases process efficiency.*



*The F190 UHF read/write head is perfect for use in the automotive industry, such as in body identification.*



[www.pepperl-fuchs.com/F190](http://www.pepperl-fuchs.com/F190)

## Robust, No Compromise

**Inductive Dual Sensors** For many years, electronic components such as inductive sensors have been firmly established as devices for detecting valve positions on valve actuators.

The current highlight from Pepperl+Fuchs is the F31K2 inductive dual sensor. This sensor is particularly impressive when used outdoors, and is suitable for all industrial and process plants where exceptional robustness is required – from the chemical industry to water treatment plants and power stations. The F31K2 is very flexible and can be mounted directly on all standard pneumatic actuators without any bracketry. The unique housing construction – in a choice of plastic or metal – and the high IP69K and IP67 protection rating ensure excellent temperature resistance, impermeability, and UV and corrosion resistance. The clearly visible “open/closed” valve position display in green and red is perfect for outdoor use. The F31K2 has already proven its quality under harsh environmental conditions in applications on pneumatic valve actuators, and more versions with explosion protection certification are to follow.



F31K2 for valve position sensing on pneumatic valve actuators.



[www.pepperl-fuchs.com/F31K2](http://www.pepperl-fuchs.com/F31K2)

## Reflective Surfaces? No Problem.

**Universal Code Reader** On shiny or curved surfaces with strong reflections, conventional code readers quickly reach their limits, since they are often unable to correctly detect the codes.

The OPC120P universal code reader has no such problems, since its integrated polarization filter simply suppresses reflected light. Its large depth of focus allows reliable code reading over an exceptionally wide distance range of 70 mm to 180 mm, with no need for mechanical adjustment or alteration of the parameters.

The universal code reader can reliably detect 1-D and 2-D codes at up to 100 readings per second and is suitable for high speeds of up to 10 m/s. Other impressive features of the OPC Series include powerful functions such as simultaneous reading of up to four different codes, logo detection, presence detection, e.g., for the use-by date, and reading of barcodes up to 200 mm long. With its robust housing and IP65 protection rating, the OPC120P is ideally suited for tough industrial applications and can be used successfully in a huge number of areas.



OPC120P – the code reader for highly reflective surfaces



[www.pepperl-fuchs.com/OPC120P](http://www.pepperl-fuchs.com/OPC120P)



# Smart Farming Gaining

***Ultrasonic sensors have been used in the manufacturing industry for more than thirty years as proximity switches with digital or analog outputs. In recent years, this sensor principle has also been gaining an increasingly strong foothold in applications where ultrasonic sensors might not be the most obvious choice: agriculture.***

The benefits of ultrasonic sensors are readily apparent. An object can be detected to the nearest millimeter, regardless of its color and surface, while dust and dirt have no impact on the measurement accuracy. The high-frequency vibration of the ultrasonic transducer surface simply shakes off any liquid droplets and dust deposits.

Pepperl+Fuchs ultrasonic sensors cover a broad detection range from a few centimeters to 10 m. This huge bandwidth is achieved by using different ultrasonic frequencies – low frequencies for long detection ranges and high frequencies for short detection ranges and high resolution.

## **Orchard Cultivation Using Ultrasonic Sensors**

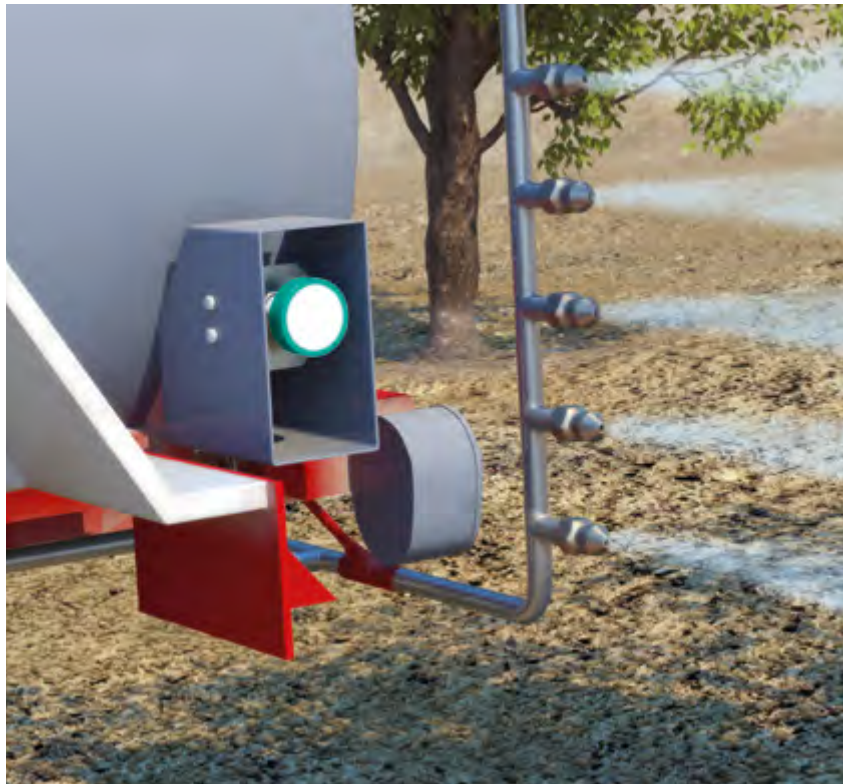
Concepts such as “Smart Farming” are shaping a radical transformation from conventional agricultural technology to high-tech agriculture, with electronic control units to optimize almost every process in the field.

The cultivation of orchards demands the utmost care to obtain a fruitful harvest. The plants have to be protected from a variety of diseases and pests. This is done using agricultural pesticides spread according to a specific spraying schedule.

## **Cost Savings through Targeted Control**

The use of agricultural pesticides drives up fruit farmers’ costs and needs to be kept to a minimum on environmental grounds. As a result, the spraying process needs to be carried out as efficiently as possible.

With the conventional method, the pesticide is sprayed continuously, including in the gaps between the trees, where no pesticide is actually needed. >>



*Ultrasonic sensors attached to the side of the storage tank detect gaps between trees and interrupt the spraying process. This increases process efficiency while simultaneously reducing pesticide costs.*

# Ground

## APPLICATION: AGRICULTURAL SPRAYERS



*Ultrasonic sensors monitor a constant spray nozzle height above the ground to ensure optimized fertilizer spreading, and prevent damage to the spray arm.*

On large agricultural sprayers with widely projecting spray arms, ultrasonic sensors help keep the spray nozzles at a constant height above the ground without mechanical fixtures, and allow optimized fertilizer spreading. The arms,

which are connected to the vehicle by a series of linkages, are protected from damage by means of ground clearance monitoring.



» Using ultrasonic sensors enables gaps in the trees to be detected. Spraying is interrupted as soon as a space is detected, cutting pesticide costs while increasing efficiency, since the pesticide storage tanks have to be filled less often.

**Easy to Use**

The ultrasonic sensors are attached to the side of the storage tank. Cylindrical ultrasonic sensors from the Pepperl+Fuchs 30GM70 Series are the perfect solution for this application. They have a sufficiently long detection range and an appropriate signal strength. With their high IP protection rating, the sensors can be used outdoors in adverse weather conditions with no deterioration

in their performance. In addition, the ultrasonic transducers, i.e., the surface of the sound-generating membrane, can be protected against the chemicals that pesticides contain using a film.

To prevent the interfering reflections caused by furrows when mounted close to the ground, the sound cone that defines the detection range of an object can easily be reduced from 100% to 70-80%. +



*BerMarTEC machines are equipped with a comprehensive range of Pepperl+Fuchs sensors that ensure efficiency and safety during harvesting.*

**APPLICATION: BERMARTEC HARVESTERS**

BerMarTEC is one of the leading manufacturers of harvesters and all-purpose machinery in South Tyrol, Italy. To enable harvesting workers to concentrate completely on picking the fruits without having to worry about controlling their vehicle at the same time, the machines are equipped with a range of innovative, automated functions, all controlled by a comprehensive set of Pepperl+Fuchs sensors.

Ultrasonic sensors allow fully automatic steering in the machine track. Trees and branches in the rows to the left and right of the vehicle act as sound reflectors. A dial on the

control panel can be used to easily adjust the sound power and the sensitivity of the sensors. This enables the vehicle to be aligned exactly in the center of a track or closer to the row of trees on the left or right.

At the same time, the ultrasonic sensors perform a pure safety function. If they detect people or objects ahead of the vehicle, the machine stops to prevent a collision. It is also stopped automatically at the end of a machine track, as soon as no more trees are detected within a set distance.



# 3 Misconceptions about **SIL**

**Plants and machinery can pose risks that are so dangerous that man and the environment should not be exposed to them under any circumstances.**

If such a hazard exists, the associated risks must be mitigated to meet the need for safety. The Safety Integrity Level, or SIL for short, is an indicator that makes risk reduction quantifiable. SIL is therefore a core element of functional safety – and simultaneously the object of many misconceptions. Dr. Andreas Hildebrandt, SIL expert at Pepperl+Fuchs, clarifies three of the most common misunderstandings.



SIL expert Dr. Andreas Hildebrandt

## Misconception 1: SIL is a device characteristic

Despite the obdurate nature of this assumption: SIL is not a characteristic of a device, plant, or machine. SIL always relates to a risk-reducing function. A Safety Integration Level – and therefore the statement that “this circuit reduces the existing risk by the factor n” – can only be assigned to a completely fail-safe circuit. However, the devices used for the fail-safe circuit must be SIL-capable to enable such a statement to be made in the first place.

## Misconception 3: Considering the probability of a system failure is sufficient with regard to SIL

Quantifying the probability of a failure of a protective device is not sufficient to fulfill a Safety Integrity Level. Primary measures for the prevention and control of faults must be implemented to this end. The relevant standard requires, first and foremost, the application of a special quality management system (Functional Safety Management System). In addition, failure control by means such as redundancy, fail-safe behavior, and fault detection (diagnostics) are mandatory. The extent to which these measures need to be applied depends on the targeted SIL.

## Misconception 2: SIL3 is automatically the better choice compared to SIL2

The SIL rating required depends on the initial risk inherent to the plant’s systems or processes. The following applies: the residual risk remaining after risk reduction must be lower than the tolerable risk. If this is achievable with SIL2, then the installation of a SIL3 protective device could in some circumstances be too much of a good thing. The overfulfillment of a SIL can result in unnecessary effort and avoidable cost, much the same as overinsurance in the private sector is unnecessarily expensive. The aim is to design the protective device so that the risk reduction it achieves corresponds as closely as possible to the required SIL.

### IN BRIEF: SIL



SIL stands for Safety Integrity Level and is a measure for quantifying risk reduction. SIL is used to assess safety-relevant circuits (loops) in plants with regard to the reliability of their safety functions. Protective devices have to fulfill a lower or higher level on the four-level SIL scale, depending on the required degree of risk reduction. Details of SIL are defined in the international standards IEC/EN 61508, 61511, and 62061.



# Industry 4.0



Complete, automatically controlled networking of plants and machines using Web technologies is one of the key issues facing the industry.

***In this interview, CEO Dr. Gunther Kegel and Dr. Peter Adolphs, Managing Director Development & Marketing, explain how the ideas behind Industry 4.0 will revolutionize the world of production and the opportunities this will present for Pepperl+Fuchs.***

**Dr. Kegel, Dr. Adolphs, the issue of Industry 4.0 is a hot topic in the automation industry. What do you think of it – trend or hype?**

*Dr. Kegel:* Web technologies are finding their way into almost every area of our lives. The Internet of people is being increasingly accompanied by the “Internet of Things,” also known as “cyber-physical systems,” and this trend began long before this year’s hype about Industry 4.0. Internet technologies will certainly result in lasting changes to production in the future – not just in direct areas of value creation, but also in areas like planning, operating data acquisition, logistics, distribution, quality assurance, etc.

*Dr. Adolphs:* The trend of Web technologies becoming established in automation has been evident for years, and would have come about even without the term “Industry 4.0.” The wide-ranging possibilities presented by cross-plant networking over the Internet are resulting in completely new functionalities that will be just as revolutionary as the establishment of the processor in automation, or even earlier innovations such as assembly line production, electricity, or the steam engine. With that in mind, I think it’s useful that this trend is being publicly recognized, and that targeted research is starting to be promoted. This is a clear acknowledgment to further expand the strong role of industrial manufacturing and automation.

**What does the idea behind Industry 4.0 mean for Pepperl+Fuchs’ strategy?**

*Dr. Kegel:* The new, sometimes visionary ideas surrounding Industry 4.0 continuously remind us that there still need to be huge advances in the cognitive capabilities of “cyber-physical systems.” Unlike with computing power and data rates, there’s no “Moore’s Law” here stating that a doubling in power can be expected every ten months almost automatically. >>

» Increasing cognitive capability will require new sensors and sensor systems that allow comprehensive acquisition of all process and geometric data in real time. For example, the expansion of our PRT technology into a third dimension is based on the visionary idea of acquiring this geometric data in the form of an exact stereo image. For a sensor specialist like us, Industry 4.0 is therefore a massive challenge, and the success of Industry 4.0 will depend to a large extent on our innovations.

*Dr. Adolphs:* What this trend means to us is that we need to consider how our sensors and systems can realistically be integrated into this new communication layer. We should be looking to bring innovative ideas to the discussion. One possible area of activity would be Web-based parameterization and commissioning tools using smartphones or tablets, which use special interfaces to communicate directly with sensors in the plant, and thus make operation easier. We will be presenting some of our specific ideas at the SPS/IPC/Drives 2013 in Nuremberg, Germany.

**“INDUSTRY 4.0 WILL BRING NEW FUNCTIONALITIES THAT WILL BE AS REVOLUTIONARY AS THE STEAM ENGINE AND ASSEMBLY LINE PRODUCTION.”** *Dr. Peter Adolphs*



**How do you see your position in terms of Industry 4.0? Is Pepperl+Fuchs a pioneer, and will this result in competitive advantages?**

*Dr. Kegel:* Industry 4.0 represents a massive opportunity and challenge for Pepperl+Fuchs, yet at the same time we have not identified any drastic risks. Sensor capabilities need to be significantly improved across all technologies and this is something that only sensor manufacturers can do. We might need to “borrow” technologies and concepts from totally different areas – games consoles for example. Still, the only ones who can make these processes industry-compatible are the sensor manufacturers. When it comes to control, changes are likely to be more fundamental and rapid, as this is where Internet technologies have a more direct impact.

*Dr. Adolphs:* Initial innovations in the Industry 4.0 area will come from control engineering. The skill will then be to pick up on those ideas and to develop and implement the sensor and system links to support them. This will require flexibility, speed, and creativity, so that we can set ourselves apart from our competitors. In this phase, we are likely to see a situation where supply creates its own demand. Many of the functions on smartphones that are now an integral part of our daily lives were unimaginable before the first smartphones appeared.



## “INDUSTRY 4.0 REPRESENTS A HUGE OPPORTUNITY AND CHALLENGE FOR PEPPERL+FUCHS.” *Dr. Gunther Kegel*

It was the technology that spurred on the creative ideas, and now the App Store has everything you could imagine. I am convinced that a similar thing will happen with Industry 4.0, and that Pepperl+Fuchs will contribute to these developments.

*Dr. Kegel:* Industry 4.0 will lead to years of coexistence of different transmission technologies. Replacing current optical fiber and radio transmission systems such as *WirelessHART* with pure Internet-based technologies will be a slow process. Our components are developed for a service life of several decades, so that they match the usage periods of our customers' machines and plants. This base of preexisting technology will not transform into a “cyber-physical system” overnight. What this means is that migration paths for communication and integration will have to be created between these networks and the world of the Internet. These could include gateways, segment couplers, or linking devices. The volumes involved are not attractive enough for the really major players, which makes digital interface systems a potentially lucrative market for medium-sized manufacturers – even if many things may end up taking longer than the bold visions promoted by all the hype are currently promising. +

## How Time Flies Three Pepperl+Fuchs Subsidiaries Celebrate Their Anniversary

**Forty years ago, Pepperl+Fuchs founded its first foreign subsidiary in Great Britain.**

It was the starting shot for rapid international growth. Today, the company has more than 30 subsidiaries around the world. Two other subsidiaries will celebrate their anniversaries alongside the British branch: Pepperl+Fuchs has been in the USA for 30 years, while Switzerland, like Great Britain, can proudly look back on 40 years. The subsidiaries have achieved a great deal in this time – and still have many plans.

### 30 Years of Pepperl+Fuchs in the USA

Founded on May 1, 1983, the US subsidiary Pepperl+Fuchs Inc. had its headquarters in Solon, Ohio, and consisted of only four employees. Today, years after relocating to Twinsburg, the subsidiary now employs 255. The product focus of the US subsidiary is on manufacturing automation with HMI products and purge and pressurization systems, alongside modifications of existing products. The sale of 85,000 ultrasound double sheet sensors to assist with the vote counting during the 2010 elections in the Philippines is a highlight fondly remembered in Twinsburg.

### 40 Years of Pepperl+Fuchs in Switzerland

Pepperl+Fuchs has been represented in Switzerland since 1973. This was initially in the form of the Digitrade AG sales agency, which was changed in 2001 to Pepperl+Fuchs AG. The company from the Biel-Bienne region shaped the history of automation technology in this Alpine country right from the start with its innovative ideas. Pepperl+Fuchs employs a staff of 17 to take care of its Swiss customers – trilingual in the German, French, and Italian regions of the country.

2013

### Pepperl+Fuchs Inaugurates New Facility in Melbourne



Pepperl+Fuchs Pty Ltd have relocated the Australian head office to the GOVAN 4,000 m<sup>2</sup> facility in Campbellfield Industrial Park, Melbourne. The facility has been renovated to meet Pepperl+Fuchs global standards, with room available for future expansion. On Friday, December 6, 2013, Pepperl+Fuchs will host an inauguration event, inviting major customers and channel partners from both the Factory Automation and Process Automation divisions. The latest technology will be on display, allowing guests to gain “hands-on” experience with key products and solutions.

The facility provides design, engineering, and manufacturing capabilities for explosion protection equipment products and integrated solutions, to support the Australasian markets.

### Celebrating Successful Collaboration



For the second year in a row, Pepperl+Fuchs Hungary thanked its customers for their close collaboration by hosting a special event. This year, they surprised guests by holding an event in Bodrogkeresztúr, located in the heart of the Hungarian winegrowing region of Tokaj. To kick off proceedings, a boat trip was planned on the river Bodrog in the north-east of the country. After the boat trip, all the guests came to visit a family-run winery, where they gained insight into the high-tech production and bottling systems in use at the traditional vineyard. Finally – as you would expect for a wine region – all participants whiled away the evening with dinner and a wine-tasting session in the 200-year-old wine cellar.

We look forward to continuing this tradition next year.

### On the Road with the Demo Bus in Northern Europe



If a green-and-white truck stops outside your door, it could be a demo bus from Pepperl+Fuchs. The buses are taking to the roads all over the world – in Scandinavia, Italy, North America, Eastern Europe, and China.

One of the demo buses has been touring Northern Europe since the end of the 1990s, where it has been visiting customers at their locations. The overwhelmingly positive experiences have confirmed the success of the “exhibition on wheels.” Last year, the old demo bus was taken out of operation and a new, larger bus took to the road. On board, Pepperl+Fuchs keeps a comprehensive selection of products for factory automation and process automation, and customers can take the opportunity to discuss their particular applications and projects on-site with an experienced member of Pepperl+Fuchs staff.

NEWS FOR FACTORY AUTOMATION + 2/2013

## Trade Shows + Events

#### HAPexpo

November 13 – 15, 2013  
 Sosnowiec, Poland  
[www.exposilesia.pl/hapexpo](http://www.exposilesia.pl/hapexpo)

#### IFAM

January 29 – 31, 2014  
 Celje, Slovenia  
[www.icm.si](http://www.icm.si)

NOVEMBER 2013

DECEMBER 2013

JANUARY 2014

#### SPS/IPC/Drives

November 26 – 28, 2013  
 Nuremberg, Germany  
[www.mesago.com/sps](http://www.mesago.com/sps)

## And the Winner is ...

After finishing in the TOP 5 at the Hermes Awards and winning the Automation Award in 2012, the R2000 2-D laser scanner from Pepperl+Fuchs is now collecting international prizes. At this year's Automation Conference in Rytró, Poland, the R2000 had an impressive showing in the "Innovation 2013" competition. The laser scanner was the winner in the "Most Innovative Product/Solution" category and also won the award as the best product in the "Instrumentation and Control Systems" category.

Every year, the Automation Conference in Rytró presents awards to the best products and trends in measuring technology and automation systems. The event was held for the 17th time this

year, and attracted representatives from Poland's major industrial corporations, technical universities, and press and media representatives.

The R2000 is the best of all laser scanners on the market. With its unique measuring performance over a scanning angle of 360° and the interactive display in the optical face, the 2-D laser scanner delivers impressive results in numerous applications, including logistics, material handling, and building automation.



## "RoboCup" Team Comes Out On Top in Project Competition

Practical applications and models relating to the field of automation were the focus of a project competition among pupils, advertised by Pepperl+Fuchs Austria. Customers were able to vote online for their personal favorite project – the RoboCup. Small robots go head to head on a bordered soccer field with the aim of landing as many goals as possible in the opponent's goal, just the same as a soccer match. Students aged 17 to 19 from the St. Ursula high school in Vienna built and programmed the robots themselves. Pepperl+Fuchs Austria was on

hand to provide the students with the expertise and products required to give life to their ideas. The robots are fitted with ultrasonic sensors from Pepperl+Fuchs, which are used for position detection and collision prevention on the field.

The winning team presented its robot at the Pepperl+Fuchs trade fair booth at SMART 2013 – Automation Austria, the leading Austrian trade fair for modern automation technology, from October 1 to 3, 2013, in the Linz Design Center. The students have already taken part in



the RoboCup world championships held in Istanbul in 2011 and in Mexico City in 2012. The team is currently in preparation for the RoboCupJunior Austrian Open in 2014.



[www.pepperl-fuchs.com/events](http://www.pepperl-fuchs.com/events)

### IPEX

March 24 – 29, 2014  
London, UK  
[www.ipex.org](http://www.ipex.org)

### Affidabilità e Tecnologie

April 16 – 17, 2014  
Turin, Italy  
[www.affidabilita.eu](http://www.affidabilita.eu)

FEBRUARY 2014

MARCH 2014

APRIL 2014

### Hannover Messe

April 7 – 11, 2014  
Hanover, Germany  
[www.hannovermesse.com](http://www.hannovermesse.com)

Vietnam is the world's number one exporter of pepper and the number two for coffee – with Germany as the biggest buyer. The Vietnamese government is promoting a smooth transition from a socialist planned system to a market economy, and since 2006 has been increasingly encouraging the development of its industry and supporting inward investment from foreign investors. In the high-tech sector, Pepperl+Fuchs has been there from the very beginning with a site in Ho Chi Minh City.

# Pepp Thin





# er Is not the Only g That's Growing

**T**he streets of the Vietnamese metropolis Ho Chi Minh City are plagued by heavy traffic. Swarms of motorbikes and mopeds dodge in and out of the cars, blasting their horns persistently as they go. Vietnam is growing, that is unmistakable. Apartment buildings are being built, while smartphones and Western clothing are increasingly the norm on the streets. Although the infrastructure is outdated, there is a lack of specialist personnel and the political leadership is dragging

its heels in moving to a market economy, Pepperl+Fuchs was quick to identify Vietnam's potential. Factors that might put other medium-sized companies off from investing here are seen as a challenge by Pepperl+Fuchs. For Hong Hanh Than, Managing Director of Pepperl+Fuchs Vietnam, the opportunities are what count. "This is a very young country. The average age is around 25. The Vietnamese are very ambitious and want to achieve lots of things." >>





NEWS FOR FACTORY AUTOMATION + 2/2013

» **From Vietnam to the Global Market**

Vietnam is aiming to supplement its traditional economic sectors of textiles and agriculture with new industries, particularly in electrical engineering and high-end products. In 2006, the government brought in new enterprise and investment laws, and since then around 2,500 foreign companies have located in so-called industrial zones (IZ) and export processing zones (EPZ), playing a major role in Vietnam’s economic development. Pepperl+Fuchs (VN) Co. Ltd. was established in 2007, and in 2008 the first employees moved into the newly constructed production facility in Tan Thuan, the country’s first

EPZ, just four kilometers from downtown Ho Chi Minh City. Within a year of its foundation, production of circuit boards began, closely followed by a production line for cable assembly. Now, the plant also produces photo-electric and inductive sensors for factory automation, and Pepperl+Fuchs supplies the global market with more than two million of them from Vietnam every year.

**State-of-the-Art Workplaces**

“I certainly didn’t expect that. You would think we were in Germany.” This is something that Hong hears quite often when he welcomes business customers and

partners to the Pepperl+Fuchs site in Ho Chi Minh City. “We established a modern plant to Pepperl+Fuchs standards here,” Hong reveals. “As a German company, we stand for quality and integrity. We are

**“I CERTAINLY DIDN’T EXPECT THAT.”**

very popular and people want to work for us,” Hong says. Five working days per week, fully air-conditioned and structured workplaces, state-of-the-art office equipment, social facilities, and salaries well above the local minimum wage have all helped to establish the site.



## PEPPERL+FUCHS SUPPORTS YOUNG VIETNAMESE ENGINEERS

The Vietnamese population is young, with the average age at around 25. This makes it difficult to find experienced engineers, while graduates from technical colleges are in demand and can be equally hard to find. As a result, in 2009 the German government and the Vietnamese central government jointly set up the Vietnamese-German University (VGU) in Ho Chi Minh City. Pepperl+Fuchs works closely with the VGU to cover its need for specialist staff and

has set up several bursaries and finances placements in Germany, which see prospective staff given training at the company's headquarters in Mannheim.



CEO Dr. Gunther Kegel (center) and the former German Minister for Economic Affairs, Dr. Philipp Rösler (right), at the Pepperl+Fuchs site in Ho Chi Minh City



### Impressive Figures

A total of 390 employees, 10,000 m<sup>2</sup> of production area, high volumes, and all of these on an upward trend. The former German Minister for Economic Affairs, Dr. Philipp Rösler, rates these figures as very impressive. In September 2012, Pepperl+Fuchs' site in Vietnam played host to a German delegation made up of former Minister Rösler and Minister of State Cornelia Pieper, the German Ambassador in Hanoi, Jutta Fräsch, and around 100 other political representatives. Rösler particularly liked the processes directly on the production lines and he was very impressed that Pepperl+Fuchs, as a medium-sized company, was one of the pioneers who took

the risk of producing in Vietnam – and with visible success. Pepperl+Fuchs has long-term plans for Vietnam, with a further plant due to be established directly across the street. It will have a production area of 10,000 m<sup>2</sup> and will create 500 jobs. +

### VIETNAM FACTS AND FIGURES

Form of government: *Socialist Republic of Vietnam*  
Capital: *Hanoi*  
Population: *around 90 million*  
Area: *331,210 km<sup>2</sup>*  
GDP (2012): *141 billion US dollars*  
Per capita income (2012): *1,595 US dollars*  
Key international trade partners: *EU, USA, China*





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