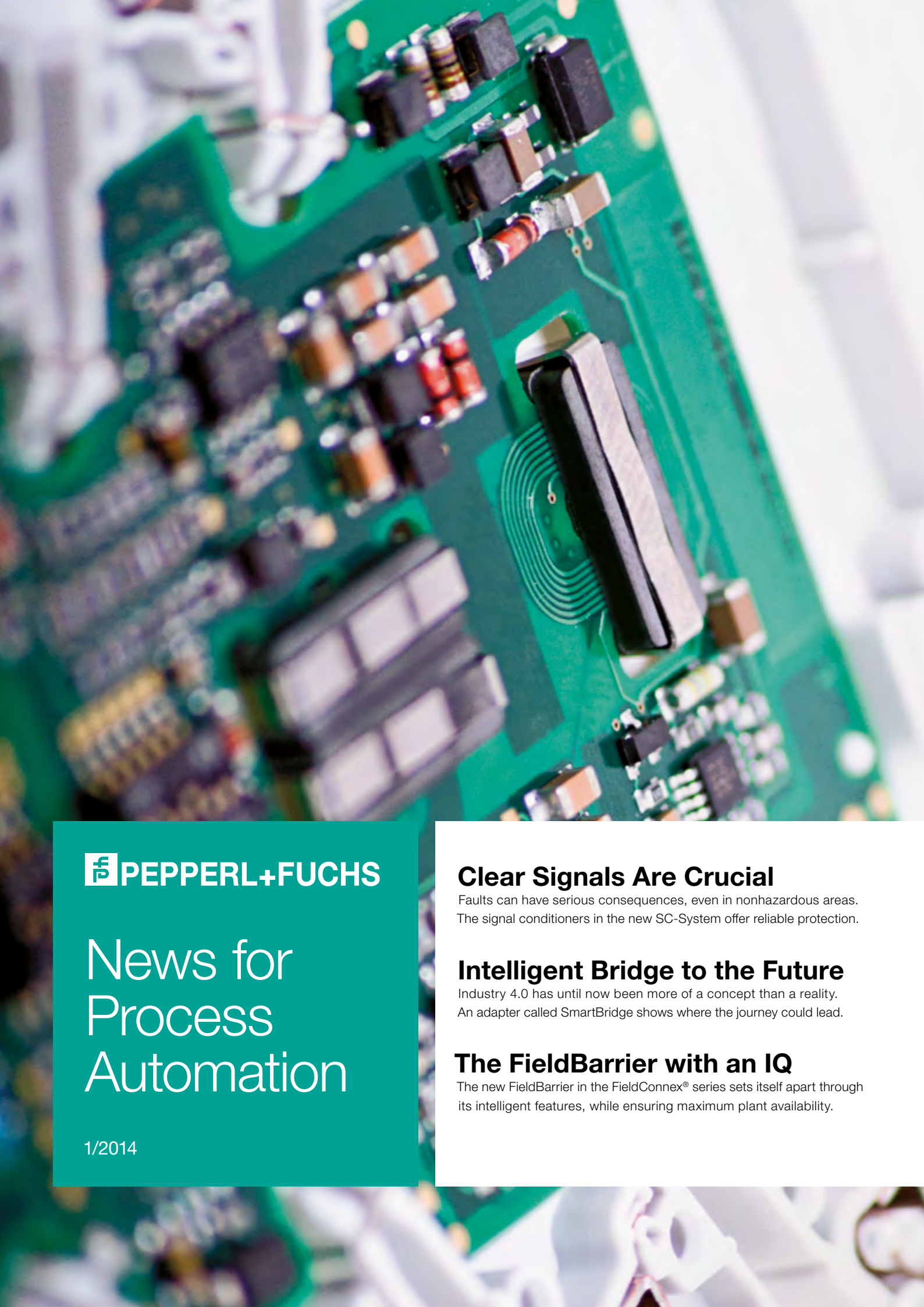


PEPPERL+FUCHS

# News for Process Automation

1/2014

## Clear Signals Are Crucial

Faults can have serious consequences, even in nonhazardous areas. The signal conditioners in the new SC-System offer reliable protection.

## Intelligent Bridge to the Future

Industry 4.0 has until now been more of a concept than a reality. An adapter called SmartBridge shows where the journey could lead.

## The FieldBarrier with an IQ

The new FieldBarrier in the FieldConnex® series sets itself apart through its intelligent features, while ensuring maximum plant availability.



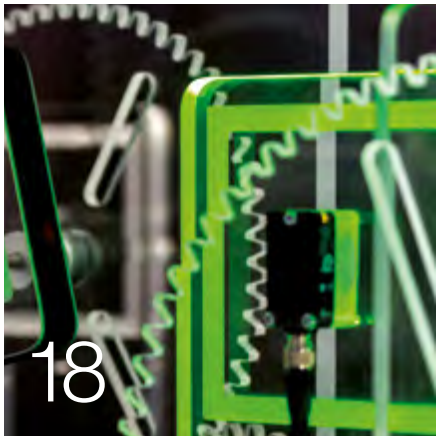




## Technologies + Products



## Applications






## Markets + Trends



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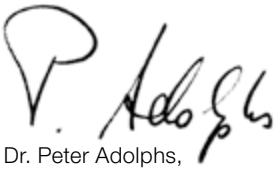
# Dear Reader,

Industry 4.0 has until now been more of a concept than a reality. We are only at the beginning of an evolutionary process that is already much more advanced in other sectors. It will probably not be long before networked and GPS-enabled smartphones are controlling entire streams of traffic as cyber physical systems, exchanging data on travel destinations, and ensuring efficient use of road space. But what does this mean for automation technology? In this context, Industry 4.0 means converting large production units and entire companies into networks. This task is far more complex, and more time is required as a result.
In introducing “SmartBridge,” we have taken the first step toward Industry 4.0. What’s behind this term, and the challenges and prospects that Industry 4.0 currently poses for our industry, can be found from page 18 onward.

Our cover story takes a look at faults in nonhazardous areas and the serious consequences that they can have. One solution is to use signal conditioners. Our new product family, the SC-System, offers reliable protection against sources of danger in the safe area, and much more.

Happy reading,



Dr. Peter Adolphs,
Managing Director of Development & Marketing

We look forward to receiving your feedback on this issue. Please e-mail any comments to: **newsletter@pepperl-fuchs.com**

# Focus

# Clear Signals Are Crucial

**Faults can have serious consequences wherever they occur, even in nonhazardous areas. The new SC-System signal conditioners from Pepperl+Fuchs offer reliable protection – and much more.**

An incorrectly transmitted signal, an inaccurate measured value – the dangers and risks from faults in hazardous areas are clear. But non-hazardous areas are also subject to considerable risks. Although the risks may be less obvious, they are far from unimportant – in non-hazardous areas, too, an inaccurate signal can result in control errors that have far-reaching consequences for people, the environment, and processes.

For example, high voltages present at signal leads due to isolation faults in mains-connected devices pose a threat to staff and equipment. In the worst-case scenario, voltages at the controller can result in people being injured.

The environment can also fall victim to inaccurate signal transmission. Flue gas desulfurization in combustion systems in power plants or in the steel industry can pose a serious environmental risk. During desulfurization, the fluid level in the milk of lime tank must be continuously monitored to prevent the tank overflowing or running dry. If the tank overflows, the milk of lime could contaminate the groundwater. If the tank runs dry, untreated gas could escape through the flue and harm the environment.

Even apart from this kind of dramatic impact on people and the environment, the general approach must be to ensure that processes run optimally and to eliminate the risk of faults. If, for example, a process needs to run at an optimum temperature in order to ensure maximum quality and efficiency, accurate communication and precise measured values are essential.

In all of these cases, signal conditioners are the best way to protect people, equipment, and processes. Using galvanic isolation, they enable seamless communication between field devices and the control system in any area where the measurement and control signal transmission process is at risk of interference. The logical consequence: with automation systems, signal conditioning should always be an important item on the agenda. This applies across all sectors – whether it be power generation or the paper and pulp industry, the steel industry, water and wastewater treatment plants, the food industry, or in cement production.

### Modern Design with Significant Advantages

With the launch of the SC-System, Pepperl+Fuchs is bringing a new series of signal conditioners to market that significantly increases safety.

The state-of-the-art circuit design does not use electrolytic capacitors. Capacitors dry out at higher ambient temperatures and lose capacity, so the developers selected components that are not subject to such aging. In addition, the low-power design results in low inherent heating. The new modules from Pepperl+Fuchs can operate in a wide temperature range from -25°C to +70°C.

“For operators, each and every degree increase counts. Any extension of the operating temperature range means fewer restrictions and greater flexibility to meet individual plant requirements,” explains Andreas Grimsehl, Product Marketing Manager at Pepperl+Fuchs. “In addition, the removal of electrolytic capacitors and elimination of the related aging effects results in significantly longer service intervals, and increased process equipment availability is guaranteed.”

Maximum availability was a major goal during the development of the SC-System. One of the results was the decision to use PCB transformers. These components achieve galvanic isolation through windings, which are integrated directly into the PCB. This makes them much less susceptible to faults, since the risk of short circuits in the windings – as can occur in conventional versions – is eliminated.

### High Precision and Compact Design

To ensure the most precise measured values, the new signal conditioner series from Pepperl+Fuchs uses fully automated laser trimming. Conventional adjustment procedures, such as the use of trim potentiometers, result in deviations and are more prone to errors.

Last but not least, the modern, compact design is a significant advantage of the new system. At just six millimeters wide and with a low housing height, the modules can be placed in tight spaces between cable ducts and require very little room in the control cabinet.

To summarize, the SC-System from Pepperl+Fuchs guarantees maximum availability and the highest possible levels of safety for staff and equipment in nonhazardous areas. This is achieved through a state-of-the-art transformer design, reliable long-term isolation, and exceptionally high galvanic separation of 300 volts for working voltage and 2.5 kilovolts for test voltage.

“For customers, it is crucial that we launch a sophisticated product capable of achieving the highest levels of quality from the beginning,” emphasizes Andreas Grimsehl. “We have been able to draw on all the experience we have gained in hazardous area applications.”

Pepperl+Fuchs is set to launch the new SC-System with an eight-module portfolio at the Hanover trade fair (see article on page 8). ■

## In Brief: Signal Conditioners

Signal conditioners are interface components between the field and control level, which galvanically isolate both signal circuits from one another. In contrast with isolated barriers, signal conditioners are used only in areas without an explosive atmosphere. Signal conditioners protect the control side against interference caused, for example, by ground loops on the field side, permitting seamless communication between the field level and the process control system.

# Three Questions on the New SC-System

**In an interview with *News for Process Automation*, CEO Dr. Gunther Kegel explains the strategy behind the latest product family from Pepperl+Fuchs.**

CEO Dr. Gunther Kegel

***Dr. Kegel, why is Pepperl+Fuchs bringing the SC-System to market?***
Over many years, Pepperl+Fuchs has established itself and gained significant expertise in the field of isolators for signals in hazardous areas. Over the course of time, additional functions have been integrated into these isolators. These functions include secure galvanic isolation, collective error messages, Power Rail, removable terminals, extended temperature ranges, SIL2 and SIL3 functional safety, and, most importantly, numerous certificates for various applications and regions of the world. Today, all of these functions are also important for signals outside hazardous areas. In the process industry, only around 25% of signals are transmitted in hazardous areas. The market for conventional signal conditioners in the process industry is therefore three to four times larger than the market for signal conditioners for hazardous areas.

***Which target group is the SC-System tailored to, and which specific customer requirements are the company responding to with this market launch?***
The question of target customers is central to all new product families that Pepperl+Fuchs adds to its range: are we reaching out to our existing customers with this innovative product and can we offer these customers additional benefits? Finding completely new customers for a new product is a very risky strategy, and one that we would only use with caution. We already offer components for conventional signals whose quality, range of functions, and ease of use are well-known to our existing customers who deal with hazardous areas. These products are derived from our existing products for hazardous areas. With the SC-System, we want to attract new customers who do not use instrumentation in hazardous areas and do not need some of the additional functions, or need them in another form. The SC-System is a product family optimized for conventional signals.

***What strategy is Pepperl+Fuchs pursuing in taking this step?***
Pepperl+Fuchs has been making waves in the automation market since the very start, and this is a segment that still has good growth prospects in the coming years. Our corporate structure is aligned towards growth for this reason. Growth in sales revenue must, however, bring with it an increase in profit. New products must lead to increased revenue without disproportionate investment in new distribution channels or new production facilities. Synergies in sales, production, and logistics are crucial for successful growth. For the new SC-System, we can utilize our sales and production expertise and create the synergies we need. ■

## Video Interview with Dr. Gunther Kegel

An in-depth video interview with Pepperl+Fuchs CEO Dr. Gunther Kegel on the strategy and background of the new SC-System can be found on our YouTube channel.

**www.youtube.com/PepperlFuchsGmbH**

# The SC-System – A Sure Thing

**The SC-System from Pepperl+Fuchs will be launched at the Hanover trade fair (April 7–11, 2014). The single- and dual-channel signal conditioners are available in various models with different functions, ranging from transmitter power supplies, to repeaters and signal converters.**

The SC-System portfolio includes transmitter power supplies, which transfer 4 to 20 mA signals from connected signal converters and simultaneously provide the supply voltage. The signal converters convert the analog measured values from the field to standard signals, which behave proportionally to values such as temperature, pressure, or flow. Voltage supply and signal transfer are conducted via the same lines. One example of where transmitter power supplies are used is in power plants. To prevent a turbine shaft from running hot, pressure transmitters continually monitor the pressure in the hydraulic systems responsible for lubricating the shaft.

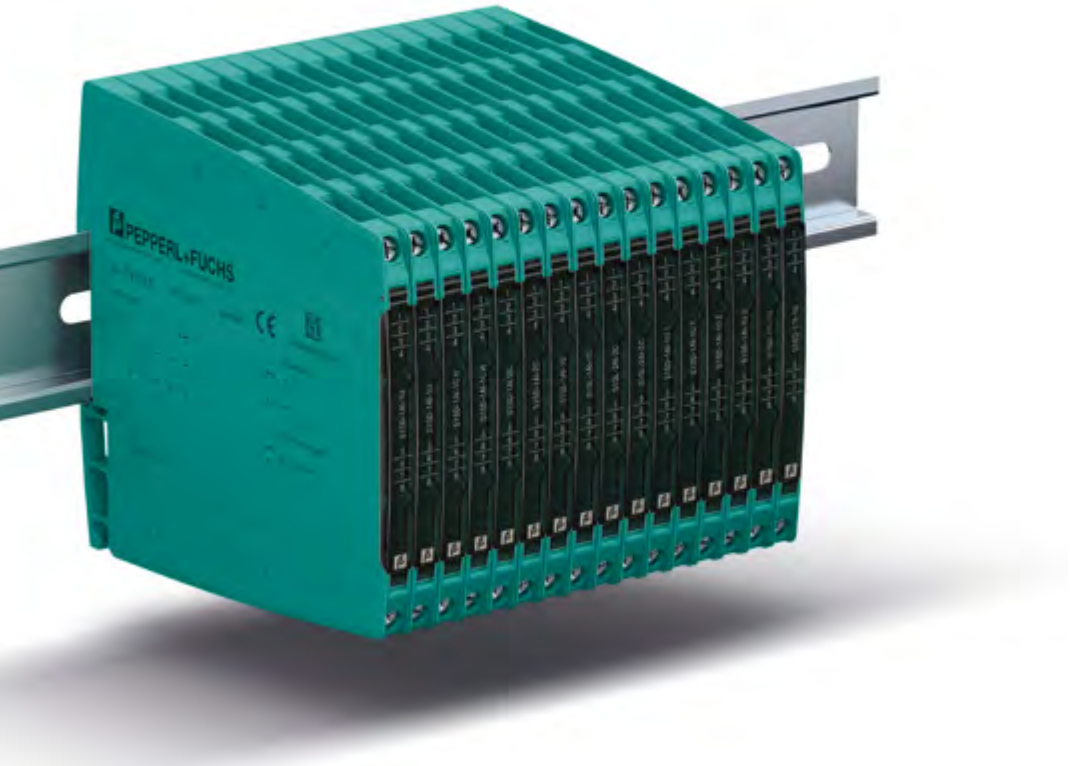
## Transmitting Additional Information

For applications where additional information from the sensor is used along with the actual measured value, Pepperl+Fuchs offers a SMART transmitter power supply. In addition to the analog 4 to 20 mA signal, the module can transmit multiple HART variables, modulated on the 4 to 20 mA signal. The SMART transmitter power supply can be used to monitor the fill level of a coolant container in a cement works to ensure continuous cooling around the rotary kiln. From the additional information in the digital HART signals, values such as coolant temperature can be transmitted to the process controller. Likewise, communication signals from the controller can be relayed to the transmitter.

## Making Measured Values Available to More than One System

Also included in the new SC-System range is a transmitter power supply with signal splitter function. This product can be used if measured values need to be available to other systems in addition to the process control system, such as for displays or safety control. Transmitter power supplies with signal splitters provide the output signal on two parallel, galvanically isolated outputs. For example, if a pressure transmitter is used to monitor the pressure of a boiler, the splitter function makes identical output signals for the controller and an emergency shutdown (ESD) system available independently of one another. If an output circuit is interrupted, reliable signal transmission to the other system is still guaranteed.

The SC-System universal temperature converter converts measured values from thermocouples, resistance temperature detectors, or potentiometers to standard signals, ensuring a high level of safety for measurement and control circuits. Both loop-powered current repeaters in the SC-System portfolio repeat the input signal as an output and provide galvanic isolation. The range is completed by the signal converter for standard signals and the universal signal converter for bipolar signals. These products function as an adapter between sensors and controllers for different types of signals. ■




State-of-the-art technology: SC-System signal conditioners

**www.pepperl-fuchs.com/sc-system**

# Everything Under Control – The New 5500 Series


**Purge and Pressurization Systems** **Pepperl+Fuchs Bebco EPS® will be launching a new Type Z & Ex pz purge system in June – the 5500 series. This series will include innovative features such as RTD inputs, a user interface for selective programming, and automatic pressure control when leaks are detected, while keeping the safe and economical approach of past solutions.**

The 5500 series system consists of a control unit that works in conjunction with the EPV vents and pneumatic solenoid valves or manual valves. The control unit is compact and designed with an interface that allows users to select a custom program for their applications. RTDs (Resistance Temperature Detectors) can be connected to inputs. The user can select temperature ranges for controlling and alarming critical temperatures through a set of contacts to energize a solenoid valve to displace air within the enclosure.

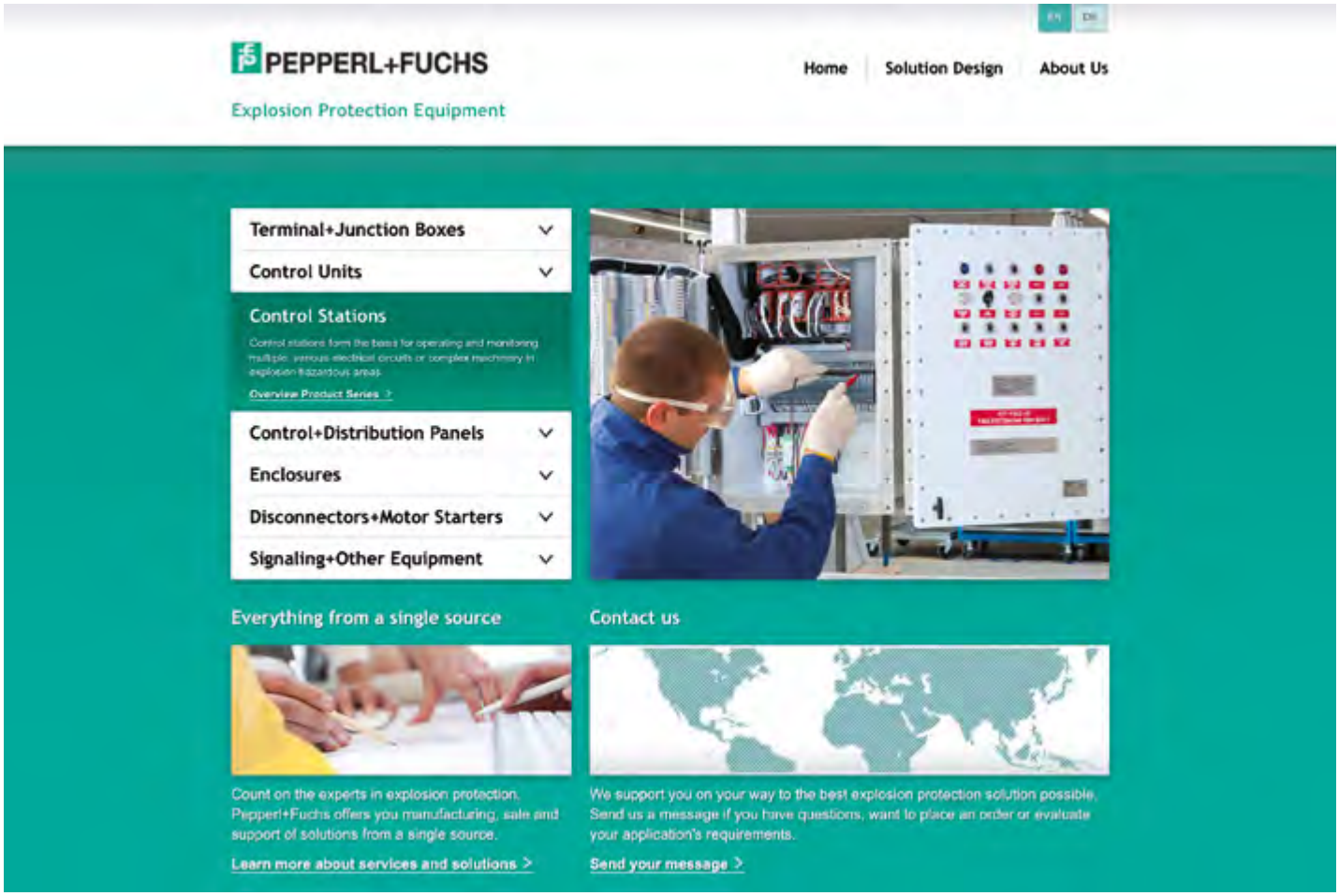
The control system is also able to automatically control pressure whenever a drop in pressure is detected. There is a pressure setting to energize the solenoid valve when a user-selected, low-pressure value is reached, so that pressure will not go below the minimum value. This rapid exchange process and leakage compensation aid in preventing alarm shutdown, which saves a company valuable time and money.

## The EPV-5500 Vent – Intelligently Designed

The EPV-5500 vent works with the 5500 control unit and valve to provide a functional, certified purge and pressurized system for enclosures. As required by all pressurized enclosure systems, the EPV-5500 vent functions as a pressure relief device and allows the purge gas to exit the enclosure, but provides a seal when the enclosure is pressurized and operating. The vent also has a spark arrestor, which is required for hazardous areas.

The 5500 series comes in a 316 stainless-steel enclosure and can be mounted inside or outside a cabinet; no connections are required. This series will hold certifications in UL, ATEX, and IECEx for Class I and II, Division 2, and Zone 2 and 22 environments. ■

# Web Portal for Explosion Protection Equipment Launched




Screenshot of the new Web portal **www.explosionprotection.com**

**Pepperl+Fuchs is offering its customers a new and easy-to-use Website for electrical components and systems involved in explosion protection. Users can find out all there is to know about the specifications and applications of a wide range of installation and control components in one place, at www.explosionprotection.com.**

Pepperl+Fuchs has an extensive portfolio of devices for distribution, control, and signal transmission in hazardous areas. From terminal and junction boxes through control and distribution panels, motor starters and switch disconnectors to signaling equipment, customers can choose from a wide variety of high-quality electrical components and systems for explosion protection. The goal of the new Website is to guide users quickly and easily to the solution they want, despite the huge variety of products.

The Website's clear menu navigation ensures that users can find what they want with just a few clicks. Divided into seven product groups and their subcategories, the portal provides all the key information at a glance when a product is called up – including data sheets, installation and operating manuals, and certifications. Users can see similar products or variants of the devices that may be of interest.

The Website is divided into seven product groups: Terminal+Junction Boxes, Control Units, Control Stations, Control+Distribution Panels, Enclosures, Disconnectors+Motor Starters, and Signaling+Other Equipment.

## Control Stations Example – Reaching the Right Solution in Just a Few Clicks

Clicking on "Control Stations" directs the Website visitor to the comprehensive Pepperl+Fuchs range of control devices in the types of explosion protection Ex d and Ex e. These devices are crucial for the operation and monitoring of machines or production plants in hazardous areas. Since they are made from high-quality materials, the control stations can be used in the toughest ambient conditions and meet high hygiene standards.

In the Ex e range, users have a choice of two series in different housing materials. Both series have recently been redesigned with new operating elements that provide a wealth of monitoring and control functions.

The FXLSCP Series is made of corrosion-resistant stainless steel, and its electropolished surface offers a high resistance to tarnishing. It is available in five variants, the largest of which comprises up to 56 operating elements. Control stations from the GLCP Series are made of glass fiber reinforced plastic and are available in seven different variants that can contain up to 35 operating elements per device.
With its selection of operating elements that can be easily integrated and combined, Pepperl+Fuchs offers its customers the opportunity to tailor control stations exactly to their individual application. Operating elements include pushbuttons and mushroom pushbuttons, rotary switches, LED indicator lights, potentiometers, and ammeters, as well as a wide range of accessories.
All of this information is just a few clicks away at the new easy-to-use Website. ■

**www.explosionprotection.com**

# Gateway Update: Significantly Better Performance

**Remote I/O Systems** **Increased data memory, more modules, and significant savings potential – these are the benefits of the new and improved gateway version for PROFIBUS.**

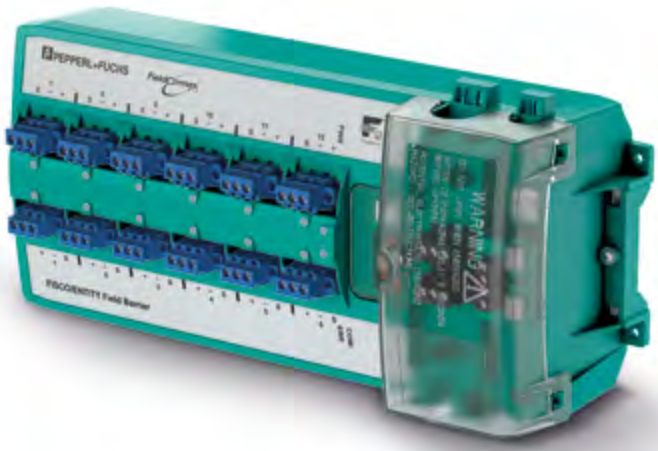
Universal modules require a higher number of data bytes for process value transfer than modules specially designed for one channel type. To provide better support for the universal modules, Pepperl+Fuchs PROFIBUS gateways are now twice as powerful as the previous models in the data range for synchronous data, with a total of 480 bytes available for process data exchange. The update also supports increased data capacity for acyclic services used to transfer data that is less time-critical.
With its increased memory, the gateway can support more modules. This improvement leads to considerable savings since fewer gateways and backplanes are required. Needing fewer gateways and backplanes saves space in the switch cabinet and reduces wiring costs.

Because the PROFIBUS gateway update involves only functional enhancements, the gateways continue to support the full range of functions offered by the previous versions. Configuration is carried out – depending on the gateway version – using the DTM or GSD parameters from the control system. ■


PROFIBUS gateways FB for zone 1, and LB for zone 2

# Intelligence Inside: the FieldConnex FieldBarrier with an IQ

**Fieldbus Technology** **Intelligent fieldbus represents a new generation of diagnostic-enabled FieldConnex fieldbus components that not only think intelligently, but intervene to prevent faults. With its most recent product in this portfolio, Pepperl+Fuchs is bringing a new FieldBarrier to the market. It can detect and isolate faults at an output and protect the segment by temporarily shutting the output down. That guarantees maximum availability of the process equipment.**



## Reliably Preventing Overload

What exactly happens when intelligent fieldbus components think and intervene intelligently? The effect of the FieldConnex FieldBarrier is clearly seen through intelligent load management. The FieldBarrier activates the outputs in sequence, preventing excessive inrush currents. If an overload is imminent during operation, then less critical loads are shed in order to protect the process system. For load shedding or fault deactivation, the output reduces the power supply to less than 1 mA, preventing excessive loads. After the repair, the FieldBarrier automatically activates the output again.

## Innovative Monitoring of the Physical Layer

By designing this new component, developers at Pepperl+Fuchs have brought economical monitoring of the physical layer to the output of the FieldBarrier for the first time. A deterioration in signal quality is indicated as a “maintenance required” or an “out of specification” message. The FieldBarrier reports this status via LEDs and to the diagnostic software in the control room via the Advanced Diagnostic Module (ADM). This innovative monitoring system is another step toward achieving maximum fieldbus transparency. It complements the physical layer monitoring by the ADM from a central location in the control cabinet.

## Progressively Locating and Isolating Faults

The new FieldConnex FieldBarrier features functions that were previously only offered by the Segment Protector. The device detects the signal dynamics caused by contact bounce, loose contacts, or vibrating equipment and can differentiate these from regular fieldbus signals. This makes the FieldBarrier ideal for detecting and isolating typical fault scenarios at every output. This is true even for temporary faults that are difficult to detect and monitor, such as faults caused by the ingress of rainwater.

### Detecting the Signs of the Times

For the new FieldBarrier, “Intelligence Inside” is anything but an empty promise. To ensure the FieldBarrier operates reliably at all times, the developers at Pepperl+Fuchs have fitted the device with a whole range of risk-minimizing functions. The central components are redundant in design and an integrated self-monitoring function detects aging of the electronics before any failure occurs. When maintenance is required, this is indicated by an LED and via the ADM, allowing maintenance work to be carried out in plenty of time.

### The Right Solution for Every Application

The FieldConnex FieldBarrier provides maximum flexibility. It makes it possible to implement segments with a high number of devices and a wide geographical area. Up to three FieldBarriers with eight, 10, or 12 outputs can be operated on one segment.
The new FieldBarrier is also available as a preinstalled solution for every application. Sizes, materials, and accessories are precisely tailored to the requirements of the process system by application experts. The field junction boxes are ready for connection and are easy to work with – they come with a single certificate for the complete unit. ■

**www.pepperl-fuchs.com/intelligent-fieldbus**

## FieldConnex Temperature Multi-Input Now Available for PROFIBUS PA

The FieldConnex temperature multi-input (TM-I) from Pepperl+Fuchs enables the highly efficient connection of eight analog input signals via one fieldbus address. In addition to the proven connection to FOUNDATION fieldbus H1, TM-I is now available for PROFIBUS PA. The TM-I transmits signals from thermocouples or resistance temperature detectors (RTDs) with two-, three-, or four-wire connections and millivolt signals to the corresponding fieldbus. Wiring costs are kept to a minimum due to the installation position of the TM-I, close to the field devices. All inputs on the TM-I are intrinsically safe, even if the fieldbus connection itself is not. They can be configured quickly and easily, either all at once or individually. The process for configuring and integrating the control technology is extremely convenient with GSD and FDT/DTM. ■

## Systematic Control Cabinet Monitoring

**The Diagnostic Gateway provides the infrastructure that is missing from fieldbus control cabinets and ensures consistent monitoring.**

If process control systems are equipped with fieldbus, only bus connections and the fieldbus power supply are located in the switch cabinet. There are no signal inputs and outputs for monitoring the ambient conditions of the control cabinet. FieldConnex Diagnostic Gateway with I/O function offers a solution, providing the otherwise unavailable infrastructure required for control cabinet monitoring.

A function block with many configuration options gathers input information from frequency, humidity, and temperature sensors, or door contacts. Digital inputs can be used for status monitoring and pulse counting. Preconfigured setups are selectable for a wide variety of tasks, such as climate control based on temperature difference or humidity, fan monitoring, or access monitoring. Undesirable deviation from normal operating conditions can be detected at an early stage and process equipment availability can be significantly increased.

The Diagnostic Gateway can be integrated via Ethernet and a fieldbus diagnostic server or included as a field device/node via FOUNDATION fieldbus H1. ■

# Salty Surroundings, Powerful Sensor

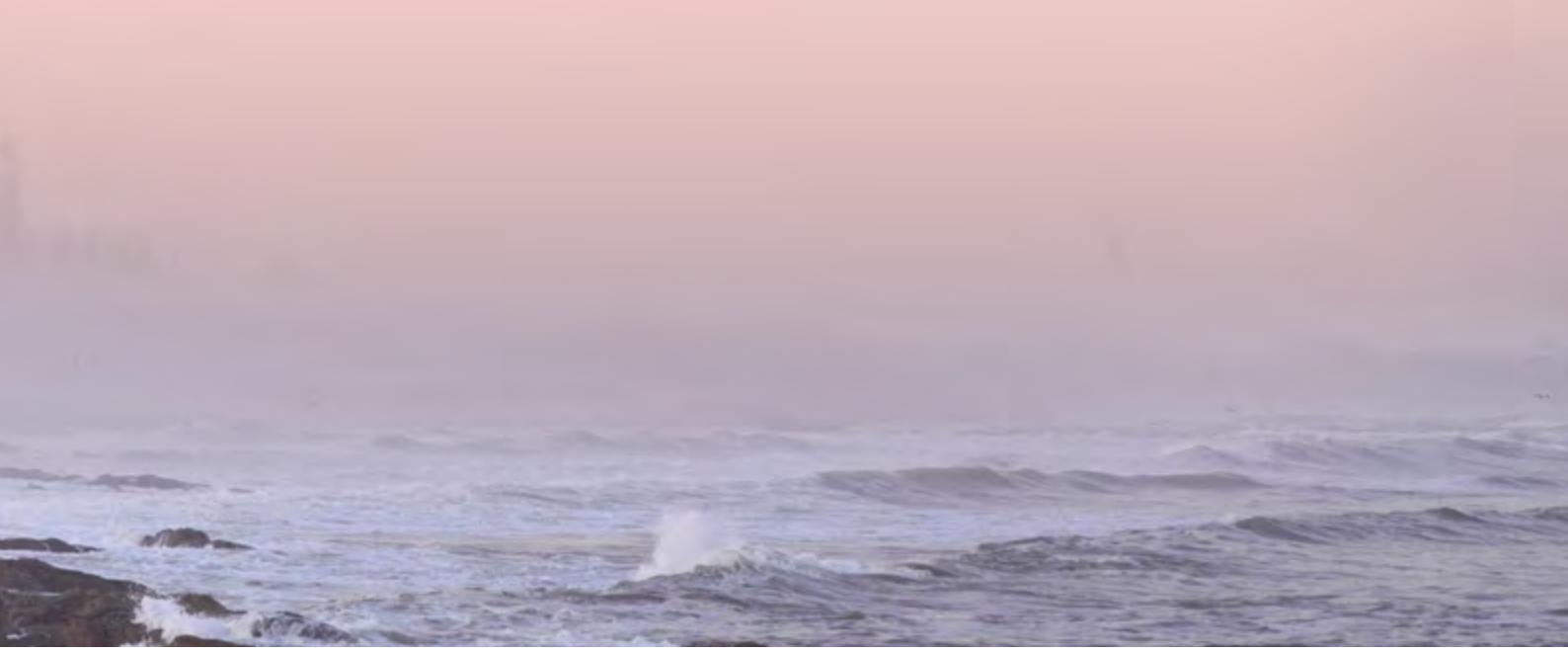
**Salt is everywhere at Frisia Zout. “Zout” is Dutch for salt and since that is precisely what Frisia produces, it is hardly surprising that the company’s tanks and pipes are filled with it. However, salt is also in the air, as the company’s plant in the Dutch city of Harlingen is located only a few meters away from the sea.**

3,000 meters below Harlingen lies the salt formation where Frisia Zout sources its raw material. Water is forced into the mineral formation at high pressure and salt-saturated brine, is pumped up into the plant’s huge tanks. Here, soda and lime react with the brine, separating the impurities from the brine resulting in lime-like residual matter, which itself is a useful by-product used in the construction industry and in fertilizers.

## Corrosive Conditions

The salt at Frisia is not only underneath the ground; the air is also salty, and often wet, as it is close to the sea. Salt causes exposed metal parts to corrode. Together with condensed water, this poses a significant problem for the switch boxes that control the company’s outdoor valves. All too often, the switch boxes have to be replaced due to corroded contacts and electrical parts. To solve this problem, Frisia Zout was eager to try out Pepperl+Fuchs’ new F31K2 dual inductive sensor for valve position feedback.

“We fitted two valve position sensors of the F31K2 Series to the supply pipes about six months ago and two more to the drain pipes shortly afterwards,” recalls Rudolf Bergsma, Head of the Electrotechnical division at Frisia. He had previously read about the new F31K2 in a Pepperl+Fuchs newsletter and immediately recognized the opportunity to solve a recurring problem that he was facing with the switch boxes mounted on the plant’s pneumatic valve actuators. These components are housed in aluminum boxes and use contacts that move mechanically.




However, they are not ideal for use in the harsh climate of the North Sea which, combined with the boxes' susceptibility to internal condensation, means that they constantly corrode inside and must be replaced frequently. The results seen during the six-month test phase were excellent and the company now plans to replace all of its switch boxes with the F31K2 sensors.

**Impressively Ruggedized**

"A lot of our equipment is made of polyester or stainless steel to ensure that it can withstand salt-induced corrosion," says Rudolf Bergsma. "When I saw the F31K2 valve position sensor's plastic cover and read about its double-housing design, I realized that this could be just what we were looking for." Bergsma then contacted the Dutch valve supplier Bray Controls and Pepperl+Fuchs, which is headquartered in the German city of Mannheim, to organize on-site testing at Frisia Zout.

"The sensor has a number of advantages which impressed us immediately," says Jos De Jong from Bray Controls, a company that enjoys a long-standing working relationship with both Pepperl+Fuchs and Frisia Zout. "This sensor is compact and the beacon in a weatherproof housing gives a very clear indication of the valve's position. With the inductive sensors, there is no need for mechanical contacts – what is not there cannot corrode! The fully encapsulated housing design of the F31K2 guarantees additional protection and high impermeability. At a very reasonable price, the sensor looked like the perfect solution to me," says De Jong.

## Did you know that …

… as a result of corrosion damage caused by salty air, major economic losses occur every year to industrial plants, buildings, and offshore installations?

… the average salt content of seawater is approximately 3.5%? The Dead Sea has the highest salt content (28%) of all lakes and oceans.

… "Fleur de Sel" is the world's most expensive sea salt? It is formed only on hot and windless days as a wafer-thin layer on the surface of the water and is siphoned off by hand.

… salt was as valuable as gold in the early advanced civilizations? The Egyptians used the "white gold" not only as a seasoning and preservative, but also for mummification.

Two F31K2 dual inductive sensors mounted on pneumatic valve actuators at Frisia Zout in Harlingen, the Netherlands.

The F31K2 is easy to mount directly onto the pneumatic actuator. The sensor is directly attached to the drive housing, and the puck merely needs to be pushed onto the drive shaft and fixed in place according to the valve's current position.

## Touch-Free Valve Position Detection

Traditional switch boxes are based on mechanical feedback systems that depend on rotary or lifting movements, e.g., conventional actuating switching elements that work via switching cams. In contrast, the F31K2 valve position sensor separates mechanical movement and position feedback by using two inductive elements. As soon as a metallic surface (target) enters the inductive sensor's magnetic field, it is detected by the evaluation electronics and the output is triggered. Simple metal targets are sufficient for valve actuators, whose positions can be detected touch-free with the inductive sensors. Since no physical contact is necessary, the sensor can be hermetically sealed from the actuator.

"The electronic solution combines a high degree of switching accuracy and precisely defined hysteresis with intrinsic ruggedness," states sales engineer Wim Kamman at Pepperl+Fuchs Netherlands. "To ensure that the sensor can connect seamlessly with existing control systems, options featuring all common connection types and interfaces are available. The beacon is visible from a long distance and gives on-site operators reliable valve position information at a glance."

The housing materials are optimized for outdoor use. They provide high UV protection and are resistant to extreme temperatures, salt water, and corrosion. The modular housing is made of a ruggedized, translucent plastic, and LEDs that indicate the power supply, sensor, and valve conditions are integrated into the encapsulated sensor module. Thanks to the large terminal compartment and pluggable terminal block, cables that are rigid or have large diameters do not pose any problems in environments where mounting work could prove difficult.

"The sensors have worked perfectly. The on-site operators are extremely satisfied, not least because of the high visibility of the signals given off by the beacon. I am certain that, over time, we shall replace all of our switch boxes with F31K2 sensors," concludes Rudolf Bergsma.

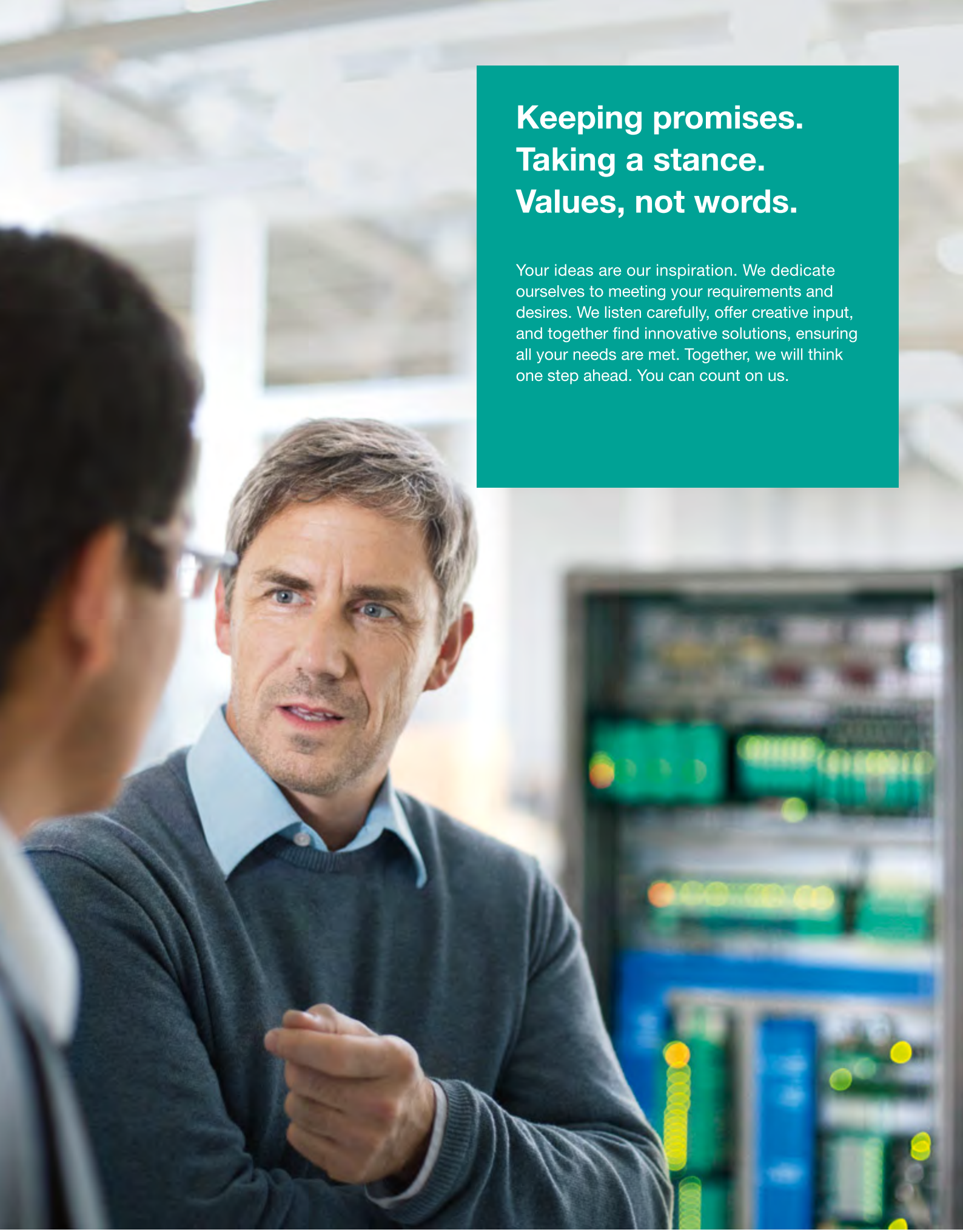
## Open Solutions for Easy Direct Mounting

The F31K2 dual inductive sensor is part of Pepperl+Fuchs' open solutions concept for valve position feedback. The concept's basic elements are an actuator (puck) and a sensor. These components can be installed without mounting brackets thanks to both the mechanical standardization of drives pursuant to VDI/VDE 3845, and NAMUR mounting holes. The sensor is directly attached to the drive housing, and the puck merely needs to be pushed onto the drive shaft and fixed in place according to the valve's current position. The sensors cover all drive sizes up to those with drive shaft diameters of 90 mm with just two puck sizes, making brackets or mounting sets unnecessary. To date, no other valve position feedback sensor on the market offers such a product feature. ■

**www.pepperl-fuchs.com/F31K2-sensor**

**Frisia Zout**, a company based in Harlingen, the Netherlands, produces and distributes roughly one million tons of high-quality salt per year. Customers include the chemical and food industries. Additionally, the company-produced salt is used for water softening and as road salt. Frisia Zout is a part of K+S AG in Kassel, Germany, which, besides salt, also offers potassium and magnesium products for agriculture and industry.

**Bray International**, with headquarters in Houston, Texas, USA, is a group of companies that contains the brands Bray Controls, Flow-Tek, RitePro, and Bray Commercial. The corporation develops and produces valve solutions for flow control such as butterfly valves, ball valves, and pneumatic and electric actuators, as well as external devices. With its modular product lines, Bray International is represented in over 40 countries worldwide.



# Keeping promises.
# Taking a stance.
# Values, not words.

Your ideas are our inspiration. We dedicate ourselves to meeting your requirements and desires. We listen carefully, offer creative input, and together find innovative solutions, ensuring all your needs are met. Together, we will think one step ahead. You can count on us.

## See SmartBridge Live

The model of an automated system using SmartBridge technology will be on display from April 7–11, 2014, at the Pepperl+Fuchs booth at the Hanover trade fair. You can connect to the system directly and control the devices yourself using a tablet computer.

Visit Pepperl+Fuchs at the Hanover trade fair 2014 in hall 9, booth D76.

# Intelligent Bridge to the Future

**Industry 4.0 has until now been more of a concept than a reality – we are only at the beginning of an evolutionary process. For Pepperl+Fuchs sensors, this process is already underway. The first step toward Industry 4.0 has appeared in the form of an adapter called SmartBridge.**


It will probably not be long before networked and GPS-enabled smartphones are controlling entire streams of traffic. If thousands of mobile devices exchange data on their owners' destinations, it will be possible to not only take detours around traffic jams, but to prevent them altogether. Route guidance ensures efficient use of road space, so every driver can benefit. In this network, cell phones function as cyber physical systems (CPS): they detect their own location (sensors), calculate potential routes (embedded software), and exchange data with all other devices within a certain radius (communication). While this will soon be a reality on the roads, its introduction into automation technology may take a little longer. After all, it is much easier to network smartphones than it is to convert large production units and entire companies into networks. "Internet technology is not only coming up against stable hierarchical pyramids, but also sophisticated, functioning, and, above all, secure technology," says Dr. Peter Adolphs, Managing Director of Development & Marketing at Pepperl+Fuchs.

## Obstacles in Automation Technology

Nevertheless, Ethernet and IP-based communication are rapidly making inroads into automated production processes. Internet technology is already being used for remote monitoring. Some devices feature embedded Web servers and can be accessed via standard browsers. However, there are bigger obstacles to entirely unrestricted, standardized communication in automation technology than there are in the realm of computers. As Dr. Adolphs notes, "The real challenge on the road to Industry 4.0 is the abstract, device-independent way in which information exchange is structured at all levels."

The only way to achieve this goal is by taking a gradual approach based on reaching a consensus. Initiatives such as PROLIST and FDI are working toward this objective. These groups of companies, research institutions, and relevant associations are working on the seamless integration of the work flow for life-cycle management, with machine-readable specifications and information management for intelligent field devices. They have established an important framework that allows the individual cells of Industry 4.0 to be joined together in functioning networks: cyber physical production systems (CPPS).

## CPS in Everyday Life, CPPS in Production

"CPS has long been a familiar part of everyday life in the form of smartphones and modern household appliances featuring an Internet connection – but it has not been involved in production," explains Dr. Adolphs. "By working together in an intelligent manner, CPS open up functions that no single device could ever achieve on its own. The same can be said of CPPS, the difference being that an actuator is used in this case to make an independent contribution to a production process within an Industry 4.0 strategy."

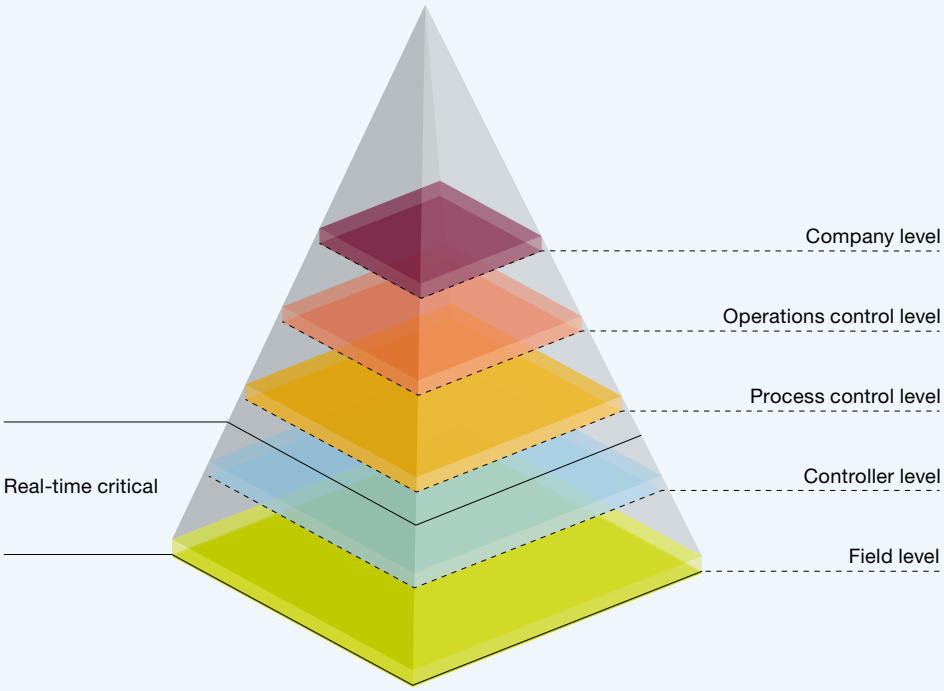
In modern production systems, any changeover to new product versions requires complex interventions and modifications that become economical only when larger unit quantities are involved. One of the central objectives of Industry 4.0 is to manufacture customized goods in small batch sizes, or even for individual customers, under the conditions and prices associated with automated large-scale production. The necessary flexibility would be created through the self-organization of the CPPS. Changeovers would be carried out more or less automatically. They would not interrupt the production process and could be completed at practically zero cost.

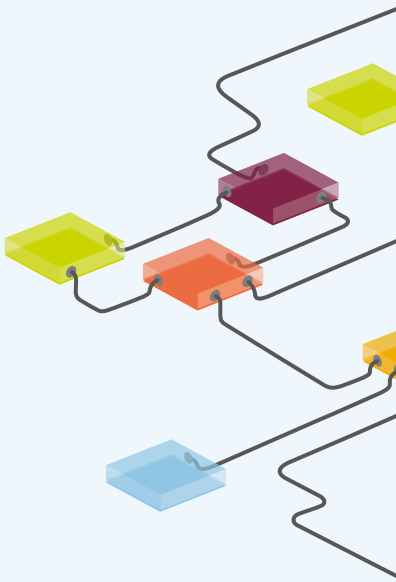
## Autonomous Drilling Service

For example, a mechanical component may need to be drilled in very different ways depending on its intended use. "The information about what kinds of holes are required could be contained in the workpiece carrier," explains Dr. Adolphs. "The component would then communicate with the drills on the factory floor and search independently for the 'drill hole' service with the appropriate parameters. Manual interventions would no longer be required. Of course, the practical obstacle in this arrangement is the ability to develop modular

Dr. Peter Adolphs, Managing Director of Development & Marketing

**By applying Industry 4.0, the conventional automation pyramid with its hierarchical structure is transformed ...**



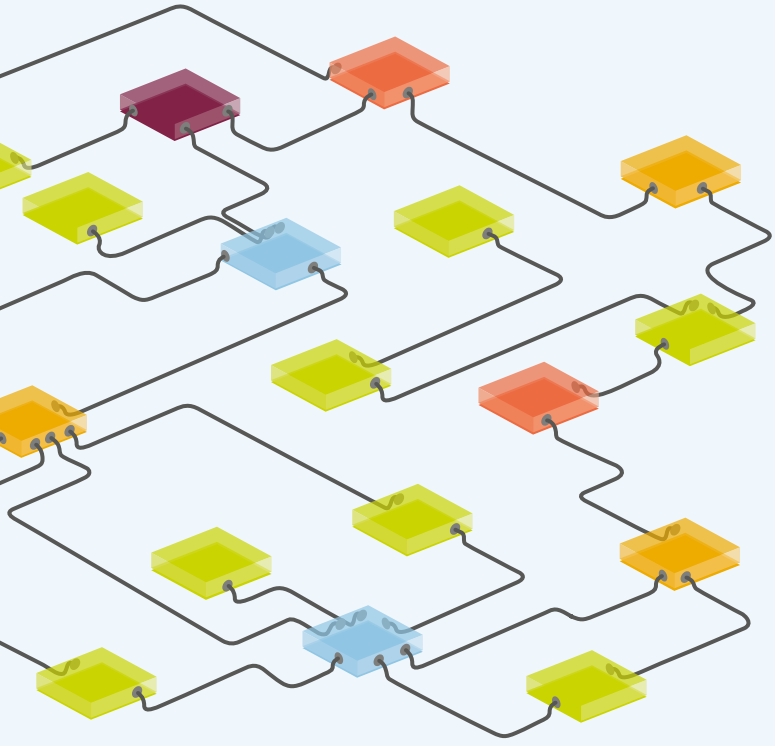
machine components at marketable prices." Furthermore, a rapid transition to Industry 4.0 structures may be prevented by safety requirements in automation, as well as the long service life of the equipment, particularly in the process industry.
In principle, working CPPS are already feasible from a technical standpoint, as the example of the drilling service unit demonstrates. Naturally, Pepperl+Fuchs is tackling this issue from the point of view of sensor systems. "When I imagine a factory or processing plant made up of networked and autonomous CPPS, the first thing I see is a major need for sensors," says Dr. Adolphs. "Many more sensors will be required, and I am sure that many areas will need significantly more detailed information, or, in other words, more accurate measurements than before."

**Sensors 4.0**

In addition to conventional measuring tasks, it will be necessary to ensure sensor access is compatible with Industry 4.0. Pepperl+Fuchs demonstrated just what this might involve by unveiling an exhibit at the SPS IPC Drives exhibition in Nuremberg, Germany. The exhibit garnered much attention and will soon be on display at the Hanover trade fair 2014. It is a plexiglass model of an automated functional unit that is equipped with multiple sensors based on different measuring principles. At the heart of the unit is a seemingly unremarkable adapter called SmartBridge.
"This small device, which can be integrated into the sensor, taps into the data in the IO-Link interface and sends it to a tablet computer or smartphone via Bluetooth," explains Dr. Adolphs. Parameters can be configured and issues can be analyzed via this connection, without the need for any disassembly and while operations are running. At the same time, the maintenance engineer can access specifications and data sheets online and use them to calibrate the sensor. Commissioning and maintenance processes are greatly simplified, and it is possible to use the data that is read out for higher-level automation tasks.
The fixed point-to-point connection prevents security loopholes. Even a tablet computer infected with a virus would not cause any damage, since transfer between the sensor and controller is not possible.
"SmartBridge represents a very practical step toward Industry 4.0," says Dr. Adolphs. "A step that doesn't need to overcome any obstacles. Since no change is required to the conventional wiring, any system can be easily retrofitted with SmartBridge with minimal work." ■

> "SmartBridge represents a step toward Industry 4.0 that doesn't need to overcome any obstacles. Any system can easily be retrofitted with minimal work."
> *Dr. Peter Adolphs, Managing Director of Development & Marketing*

**... into a CPPS-based form of automation with autonomous devices.**



## Video Interview with Dr. Peter Adolphs

An in-depth video interview with Dr. Peter Adolphs on the topic of Industry 4.0 and SmartBridge can be found on our YouTube channel.

**www.youtube.com/PepperlFuchsGmbH**

# Africa – A Continent with Enormous Growth Potential

**With a population of one billion people, Africa is a continent that offers huge growth potential. Pepperl+Fuchs is increasing its presence in Africa and pursuing a long-term strategy, explains Marc Van Pelt, Sales Director for Process Automation in Western Europe & Africa.**

***Mr. Van Pelt, what is the current status of Pepperl+Fuchs in Africa?***
Until now, we have mainly operated in the African market with external sales partners. Only in South Africa have we been involved with the local partner company, which we integrated fully into the Pepperl+Fuchs Group on March 1 this year.

***What future prospects do you see for the continent?***
Seven of the ten countries in the world with the highest growth rate are in Africa. Following the boom in raw materials, we are seeing increasing demand for our products, especially in process automation, as well as in industrial sensors for factory automation in South Africa. Of course, there are major problems in some countries, but in many others – about which little is reported – we are seeing very positive developments in a stable environment. Africa is a giant that is just waking up, but is already demonstrating its potential.

Marc Van Pelt, Sales Director
for Process Automation in Western Europe & Africa

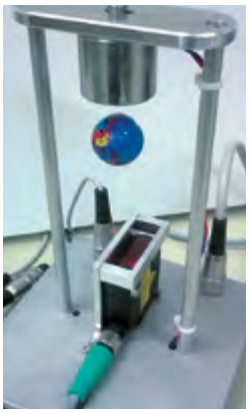
***What does your strategy look like?***
Our new subsidiary in Johannesburg is responsible for customers in South Africa and in the rest of Africa south of the Sahara. It will work closely with our established offices in Kenya and Nigeria. The francophone countries in North and West Africa will continue to be supported by our branch in France. We will forge closer links within our network in Africa so that we can be closer to our customers and provide them with an even better service. ■

## New Branch Office in Johannesburg

The new Pepperl+Fuchs subsidiary in South Africa officially opened on March 1, 2014. This office will take on all the business activities of previous sales partner P&F Products cc based in Edenvale, just outside Johannesburg. All employees will transfer to the new subsidiary, along with the building and warehouse. The new subsidiary in Johannesburg will be responsible for South Africa and most other African countries south of the Sahara. ■

**www.pepperl-fuchs.co.za**

# Expertise and Sensors for Aspiring Engineers



**Promoting young talent is extremely important at Pepperl+Fuchs. The company sponsors partnership projects that support training for aspiring engineers by providing product and technology expertise.**

The most recent example of such a partnership is the Ostfalia University of Applied Sciences in Wolfenbüttel in the north of Germany. In the university's laboratory for mechatronics, Prof. Dr.-Ing. Rolf Roskam and Dipl.-Ing. (Fh) Nanno Peters have created an unusual test setup, in which a Pepperl+Fuchs laser triangulation sensor is used to determine the position of a metal globe in a magnetic field. Using a sophisticated control technique, the high-resolution sensor enables the globe to be located with an accuracy of up to 20 millimeters. The mechatronics students test their model-based control of the system on a total of 16 magnetic levitation units. By observing the actual interaction between sensors, actuators, hardware, and software, the aspiring engineers are building on the theoretical skills learned in their courses. ■

# Trade Shows + Events

## April 2014

**HANNOVER MESSE**
April 7 – 11, 2014
Hanover, Germany

## May 2014

**Offshore Technology Conference**
May 5 – 8, 2014
Houston, TX, USA

**Automation & Engineering**
May 14 – 15, 2014
Brussels, Belgium

**SEPEM Industries Est**
May 20 – 22, 2014
Colmar, France

**NEFTEGAZ**
May 26 – 29, 2014
Moscow, Russia

## June 2014

**Eliaden**
June 2 – 5, 2014
Lillestrøm, Norway

**MEORGA Rheinland**
June 4, 2014
Leverkusen, Germany

**Global Petroleum Show**
June 10 – 12, 2014
Calgary, Canada

## August 2014

**ONS**
August 25 – 28, 2014
Stavanger, Norway

## September 2014

**Instrumentation Scotland**
September 3 – 4, 2014
Aberdeen, UK

**Automatik**
September 9 – 11, 2014
Brøndby, Denmark

**MEORGA Südwest**
September 17, 2014
Ludwigshafen, Germany

**World of Technology & Science**
September 30 – October 3, 2014
Utrecht, Netherlands

## October 2014

**Offshore Technology Days**
October 14 – 16, 2014
Bergen, Norway

**Interphex**
October 16 – 17, 2014
San Juan, Puerto Rico

**Offshore Energy**
October 28 – 29, 2014
Amsterdam, Netherlands

## November 2014

**MEORGA Rhein-Ruhr**
November 5, 2014
Bochum, Germany

**EIC Connect Oil & Gas**
November 25 – 26, 2014
Manchester, UK

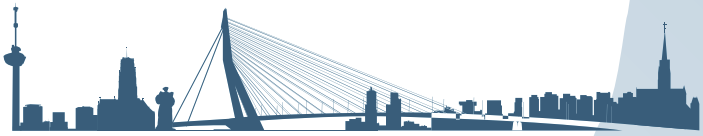
**SPS IPC Drives**
November 25 – 27, 2014
Nuremberg, Germany

**www.pepperl-fuchs.com/events**

# Fiets

The Dutch love their “fiets.” Almost every inhabitant owns a bicycle. Twice as many bicycles take to the roads as cars. However, this passion can sometimes be expensive. Hefty penalties apply even for minor offences such as having faulty pedals (EUR 30) or keeping the bicycle frame in poor condition (EUR 45).





## Rotterdam

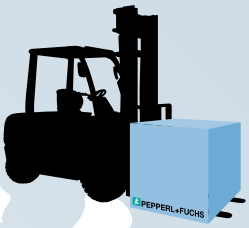
The second-largest city in the Netherlands boasts the world’s third-largest seaport. As a hub for industry and trade, Rotterdam catches the visitor’s eye with its impressive skyscraper skyline and the characteristic angled pylon of Erasmus Bridge, which stands 139 meters high. It is this pylon that gives the bridge its nickname “de zwaan” (the swan).

## Koningsdag

On “Koningsdag,” or “King’s Day,” the Dutch celebrate the birthday of their monarch, currently King Willem-Alexander. Old and young alike have fun in the great outdoors. Streets, parks, canals, and houses are transformed into a vision of orange, the color of the Royal House of Orange-Nassau.

## 1,200,000,000

The Netherlands produces this many liters of beer every year. Two-thirds of this beer is ultimately exported, making the Netherlands the world’s largest exporter of beer.




## Country of Exports

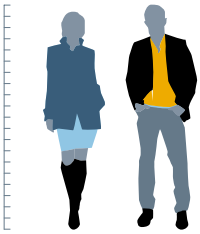
The Netherlands is one of the world’s largest export countries. Pepperl+Fuchs Netherlands sold 319,468 products in 2013, which means a growth of approximately 250 percent over the last four years. 65 percent of these products are delivered to OEM customers, who spread them – installed in machines and plants – all over the world.


## Hitchhikers

The Netherlands provides official stops for hitchhikers, known as “liftershalte.” Signs depicting an outstretched thumb indicate that travelers can try to hitch a ride at these locations.

## The Tallest

The Dutch are the tallest people in the world. The average height is 1.83 meters for men and 1.70 meters for women.



# Tulips, Cheeses, and Other Successful Exports

**The Netherlands is this year’s partner country at the Hanover trade fair. With the slogan “Global Challenges, Smart Solutions,” this small country in the heart of Europe is showcasing its solutions for industrial challenges; solutions that are setting trends all over the world. The Netherlands has a great deal to offer, and Pepperl+Fuchs has been active in the country for more than 30 years.**

Twice as many bicycles as cars on the roads, a booming tulip and vegetable export market, and old windmills as far as the eye can see: welcome to the Netherlands! A small country on the North Sea coast that has a great deal more to offer than the familiar clichés of cheeses, cows, and clogs.

Its national territory spans just 400 km in length and 200 km in width. Although the Netherlands is one of the most densely populated countries in the world, its overall population is less than that of major cities such as Shanghai. And yet, the Netherlands is one of the world’s largest export countries; it is the third-largest exporter of agricultural products, even though just three percent of the population work in the agricultural industry. With Rotterdam being the third-largest port on earth, the country is an important center for global trade.

## Low Mountains and Tall People

The Netherlands takes its name from a geographical feature – around a quarter of the national territory is below sea level. The Vaalserberg in the province of Limburg is the highest point in the country at just 323 meters high, which is lower than the Empire State Building. The inhabitants themselves are anything but small. With an average height of 1.83 meters for men and 1.70 meters for women, the Dutch stand taller than any other nation. At the same time, they are considered to be very open-minded – and a little bit crazy. Their motto? "Act normally, that's crazy enough."

Pepperl+Fuchs has been active in the Netherlands since 1972. That year saw the start of its collaboration with process technology company Wildevuur. In 1986, Pepperl+Fuchs took over the partner company and made it part of the corporate group as one of the first foreign subsidiaries. "The new company was called Pepperl+Fuchs Components, and the name said it all," recalls Marcel Tibosch, Sales Manager in the Factory Automation division, who has worked at Pepperl+Fuchs for 23 years. "Our focus was clearly on the sale of individual components."

## From the Product to an Overall Solution

The focus on individual products has long since passed, and has now shifted onto overall solutions, following the global trend. "Users today have neither the time nor the specialized staff required to investigate the specific details of explosion protection and the applicable regulations in each case," says Geert van de Wiele, Sales Manager in the Process Automation division. "Customers want to concentrate on their core business. As a supplier of complete solutions, we provide optimum customer support in this area, setting ourselves apart from the competition." His summary of the typically Dutch customer mentality is as follows: "If there is a problem, Dutch people expect you to present the solution quickly. Anyone who manages to do this wins their long-term trust."

With Vanderlande, Pepperl+Fuchs Netherlands counts one of the world's largest providers of luggage conveyor systems among its customers. The company equips airports in London, Paris, and Amsterdam, among other places. In addition, Sales Manager Marcel Tibosch's team at the 's-Hertogenbosch branch serves many other companies in a wide

"If there is a problem, Dutch people expect you to present the solution quickly. Anyone who manages to do this wins their long-term trust."
*Geert van de Wiele, Sales Manager Process Automation*

"Our OEM customers have a multiplying effect. Customers see the products supplied by Pepperl+Fuchs installed in machines and equipment, and discover the quality of our solutions."
*Marcel Tibosch, Sales Manager Factory Automation*

## Facts and Figures

| | |
|---|---|
| ***Capital*** | Amsterdam |
| ***Seat of government*** | The Hague |
| ***Area*** | 41,548 km$^2$ |
| ***Population*** | 16.82 million (2013) |
| ***Form of government*** | Parliamentary monarchy |
| ***Head of state*** | King Willem-Alexander |
| ***Head of government*** | Prime Minister Mark Rutte |
| ***GDP*** | 840.4 billion US dollars (2013) |
| ***National anthem*** | Het Wilhelmus |
| ***Internet TLD*** | .nl |
| ***Country calling code*** | +31 |

A typical feature of Amsterdam, the capital of the Netherlands, are the “grachten” – narrow, artificial waterways that run through the city center in several rings, straddled by numerous bridges. Because the canals were one of the major ways to transport goods and people in times gone by, taxes for buildings were determined by their width on the canal. The result is houses with very narrow fronts, but standing comparatively high.

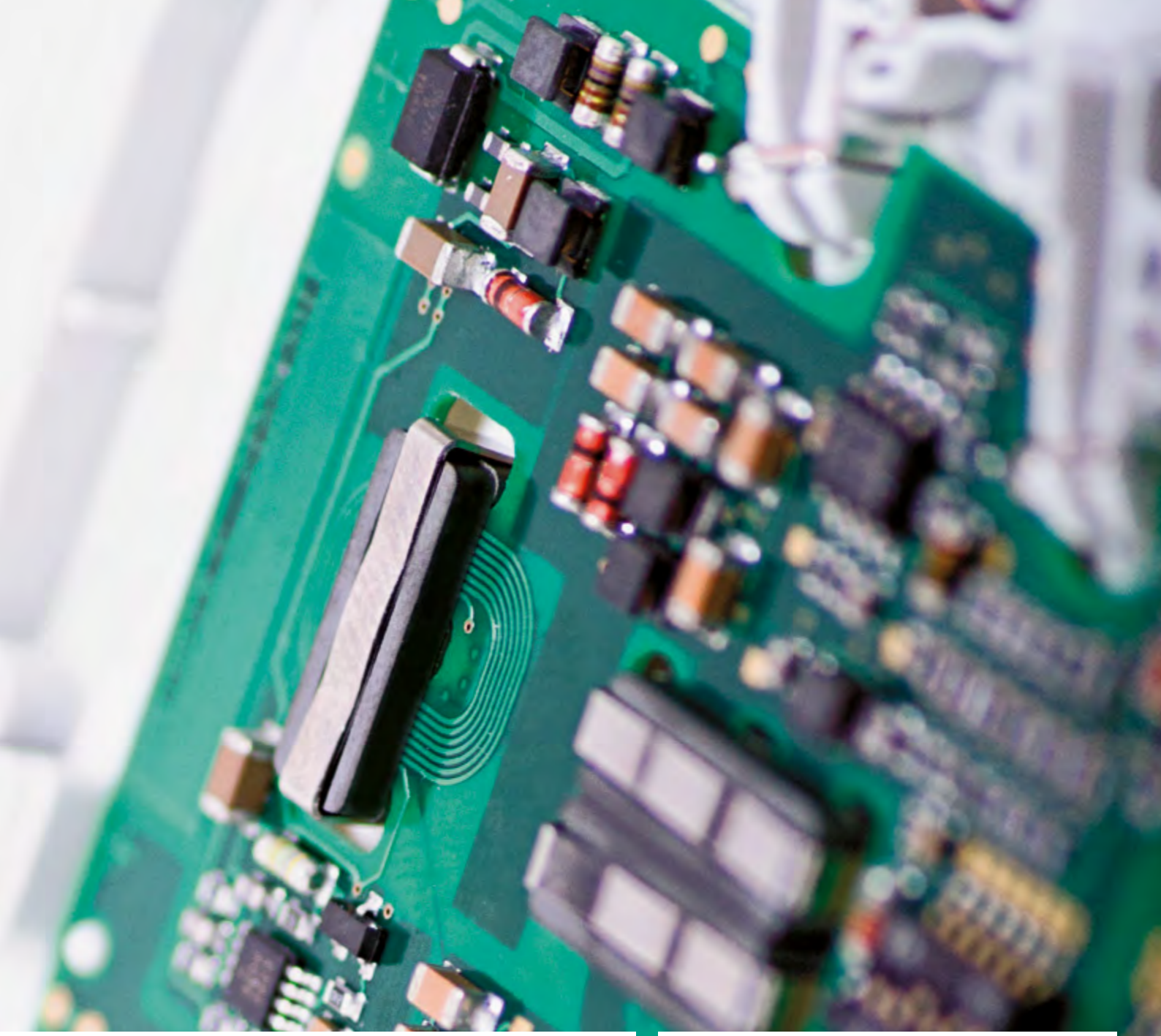
variety of sectors, including mechanical engineering, material handling, automotive, agricultural machinery, and distribution systems. “The strong focus of our customers on the export market has a pleasant side effect. Not only do our products gain a wider reach in the world in the machines and plants of OEM customers, we can also carry our solid reputation far beyond the Netherlands’ borders,” explains Marcel Tibosch.

### Beyond National Borders

For customers in the process industry, national borders do not play a major role. This applies from the very beginning. “The process industries today are highly internationalized. A large portion of our projects involve multiple countries – and with open sea between them,” explains Geert van de Wiele. In addition to the chemicals and petrochemicals industry, the industry for the offshore extraction of oil and gas is a key market for Pepperl+Fuchs Netherlands.

### Orange Fever

Even though the international spirit is prevalent in the Netherlands, the country enthusiastically celebrates its own national identity. King Willem-Alexander and the royal family are extremely popular. Orange is not only the symbolic color of the Royal House of Orange-Nassau, but also the entire nation, as seen at every major sporting event – particularly with soccer as the national sport. At soccer events, it is not only the national team and fans that dress in orange; the entire country seems covered in orange. The phenomenon that the Dutch themselves describe as “orange fever” is rampant. ■



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