

# News for Process Automation

1/2017

## **A Flash of Inspiration**

The new plug-in surge protection system protects plants from lightning strike damages.

## **HMI to Go**

Mobile devices for explosion hazardous areas extend the Pepperl+Fuchs product portfolio.

## **People Make the Difference**

Three experts discuss the working world of tomorrow.



# Editorial

**Dear reader,**

Picture a fully functioning clock mechanism: a large number of individual parts work together to make the whole thing run. Every tiny gear is perfectly integrated into the operation so that it does not impede the movement. At the same time, there cannot be any missing gears because every little part plays an essential role in driving the overall mechanism. Just like clockwork, industrial applications need components that integrate seamlessly into processes while playing a key role in the higher-level system. In such applications, it is often the small things that have a big impact. Take for example a slim surge protection module that is easy to integrate into existing processes and reliably protects our customers' plants against surge voltage. In this issue, you can find out more about the electrifying (in every sense of the word) story behind it and the result of the development work: the intelligent M-LB-5000 surge protection system.

You can also read about how we are welcoming two new members to the Pepperl+Fuchs Group. This will expand our portfolio with key components that fit perfectly into our value chain and the solutions we offer. Working together with our existing products and our expertise in explosion protection, these new additions will act as the gears that allow us to continue leading the way with innovative complete solutions for our customers.

I hope you enjoy reading this issue and find the insights interesting,



Lutz Liebers  
President Division Process Automation, Pepperl+Fuchs GmbH

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



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## TECHNOLOGIES+ PRODUCTS

04



09

### 04 Focus: A Flash of Inspiration

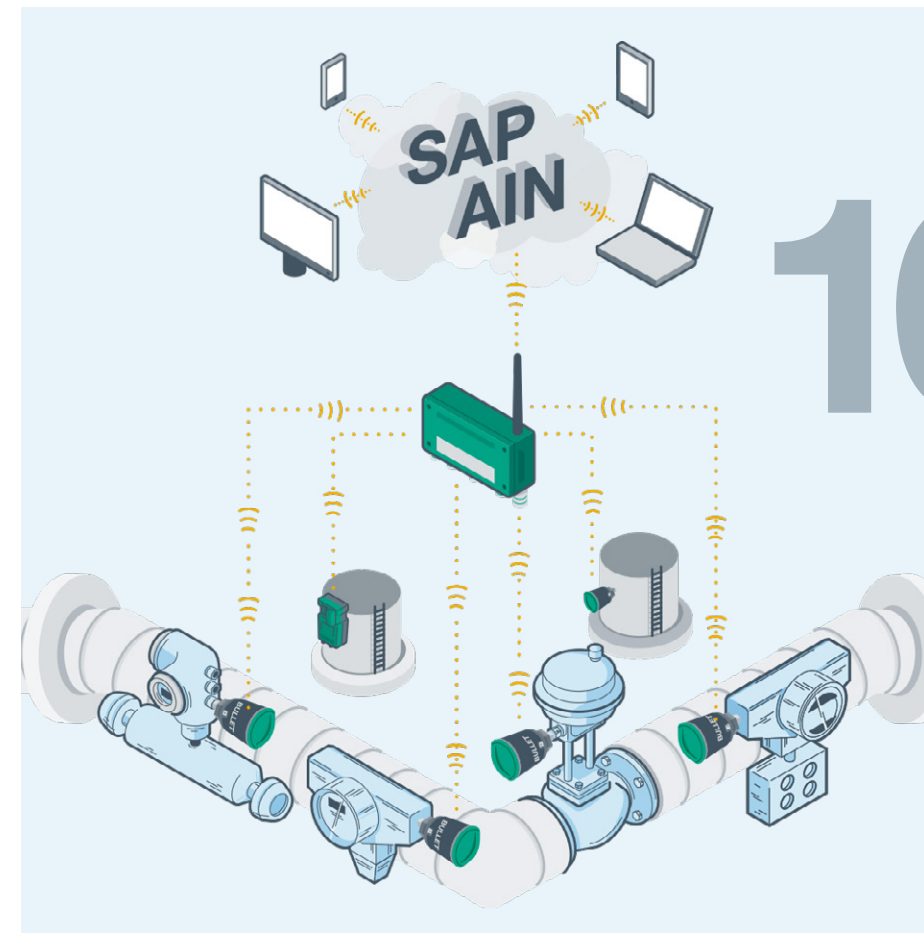
The new plug-in surge protection system protects plants from lightning strike damages.

### 09 HMI to Go

Mobile devices for explosion-hazardous areas extend the Pepperl+Fuchs product portfolio.

## APPLICATIONS+ KNOWLEDGE

12



16

### 12 Melting Pot in the Indian Ocean

The production site in Chennai complements the Pepperl+Fuchs group.

### 16 Looking at the Bigger Picture Together

Together with strong partners, Pepperl+Fuchs has developed an overall solution for the process industry.

## MARKETS+ TRENDS

20



24

### 20 People Make the Difference

Three experts discuss the working world of tomorrow.

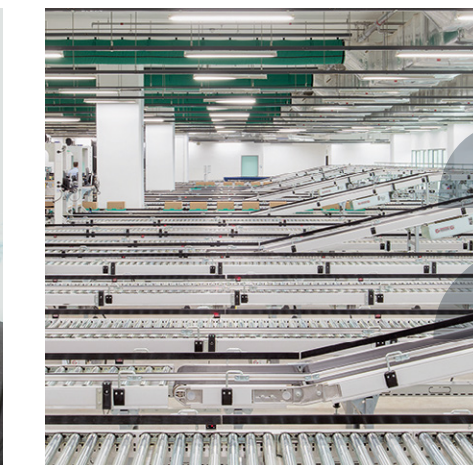
### 24 Lateral Thinking Required

What makes an innovation team?

### 27 Material Flow with Vision

How products from Mannheim, Singapore, and Houston make their way all over the world.

27



Pepperl+Fuchs



Focus

# A Flash of Inspiration

Rarely do beauty and danger lie as closely together as in this natural wonder: As impressive as the bolts of lightning that illuminate the sky may be, the consequences of a lightning strike can be devastating. Driven by fascination for this natural phenomenon, along with experience, ambition, and a few “flashes” of inspiration along the way, Pepperl+Fuchs has developed a 6.2-mm-wide plug-in surge protection system that offers much more than just protection.

It's hard to believe but true—Roy C. Sullivan, a former ranger at an American national park, was struck by lightning an incredible eight times during his lifetime and walked away each time with only minor injuries. This earned him an entry in Guinness World Records. Statistics on the international occurrence of thunderstorms are equally incredible: Experts estimate that, at any given point in time, there are 2,000 to 3,000 thunderstorms worldwide accompanied by up to 30 million flashes of lightning each day. Most lightning strikes occur in regions in South America, along the equator in Africa, and in Asia. “So it's no surprise that the first impulses to work on the subject of lightning and surge protection came from Asia,” says Friedrich Füß, Product Portfolio Manager Interface Technology for Interface Technology at Pepperl+Fuchs in Mannheim.

## “Initial Spark” After Lightning Strikes

One of his first research trips led him to Asia, to the Institute for Surge Protection in Shanghai. “The Institute is a leading authority in China,” explains Füß. “There, damage caused by surges from large lightning strikes is well known because people have personal experience with strong storms and have to deal with the consequences.” He also got a taste of this himself: His appointment at the institute was canceled because the director he was supposed to meet with was called to investigate a lightning strike on a soccer field that had fatal consequences.

Despite this, or indeed because of it, Füß was undeterred in his pursuit of the topic, and he dedicated himself to assembling a team that came to be true experts in surge protection. “The features that we have developed in minimal space for the new M-LB-5000 (Modular Lightning Barrier) surge protection system were only possible thanks to the wealth of ideas from a highly motivated group. The five-man core team, along with about 25 colleagues from production, purchasing, engineering, and service, has achieved great things,” sums up Füß. ▶▶

*“It is the sum of the additional functions that makes the new surge protection module so special.”*

Friedrich Füß, Product Portfolio Manager Interface Technology



Left to right: Friedrich Füß, Thomas Lebkücher and Thomas Ofenloch

## Surges—The Most Underestimated Cause of Damage

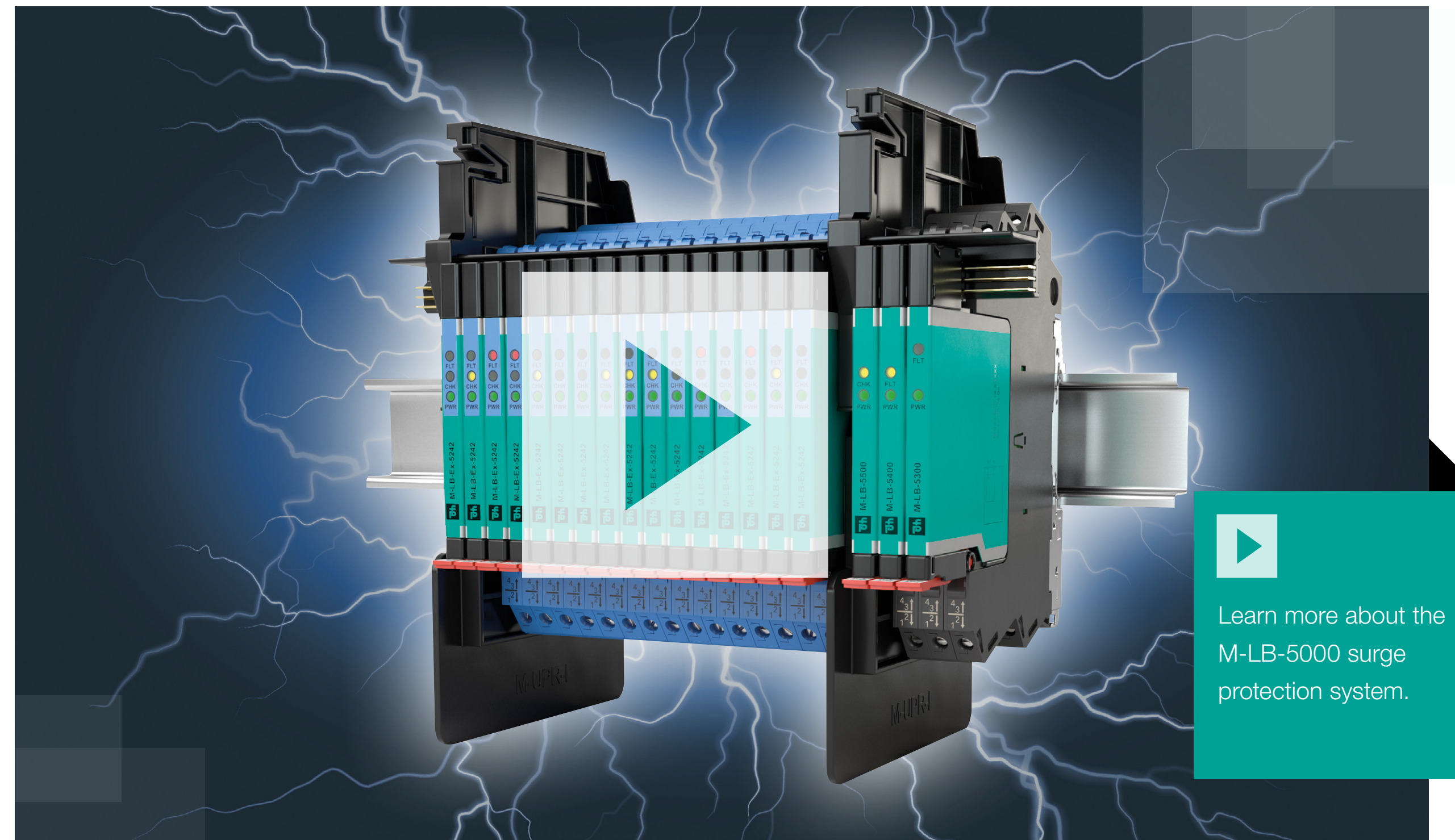
Lightning discharges within ten microseconds, creating currents of up to 100,000 amps and several million volts and can immediately heat the surrounding air to up to 30,000 °C—the equivalent of more than five times the surface temperature of the sun. If such a force of nature hits unprotected industrial plants, it can have disastrous consequences: fires, damage to electronics, failure of entire automation systems, and damage to or the complete destruction of the plants and buildings—to say nothing of the danger to human life.

“The probability of a direct lightning strike is fortunately extremely low, but this is only the tip of the iceberg,” explains Thomas Lebkücher, Head of the Mechanical Design Product Group for process automation at Pepperl+Fuchs in Mannheim. “The impact of an indirect lightning strike is frequently underestimated. Even if a flash is a few hundred meters away, voltage peaks can bring the entire electrical system to a standstill. Overvoltages caused by direct or indirect lightning strikes, but also due to switching operations, are therefore still one of the most common causes of damage in electrical systems.”

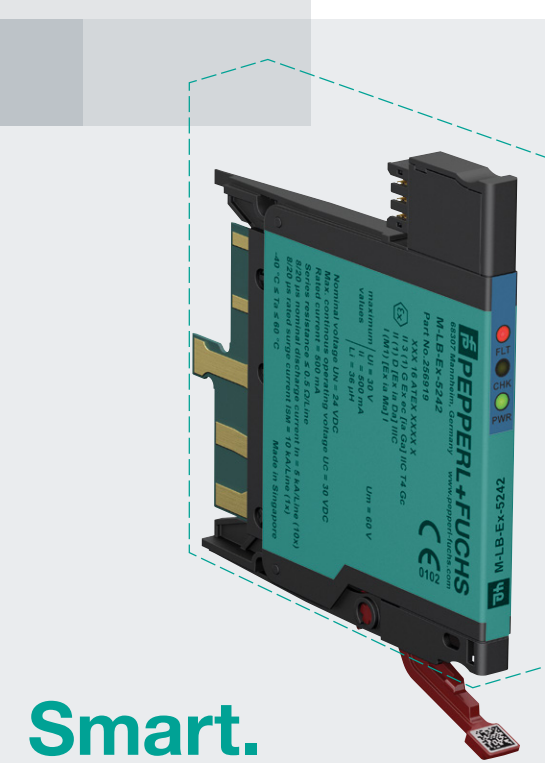
For these reasons, modern surge protection is an investment in increased operational reliability and plant availability. But how is the protective equipment designed, and what has to be considered during implementation to create as much added value as possible for the user?

## One Serious Requirements Profile

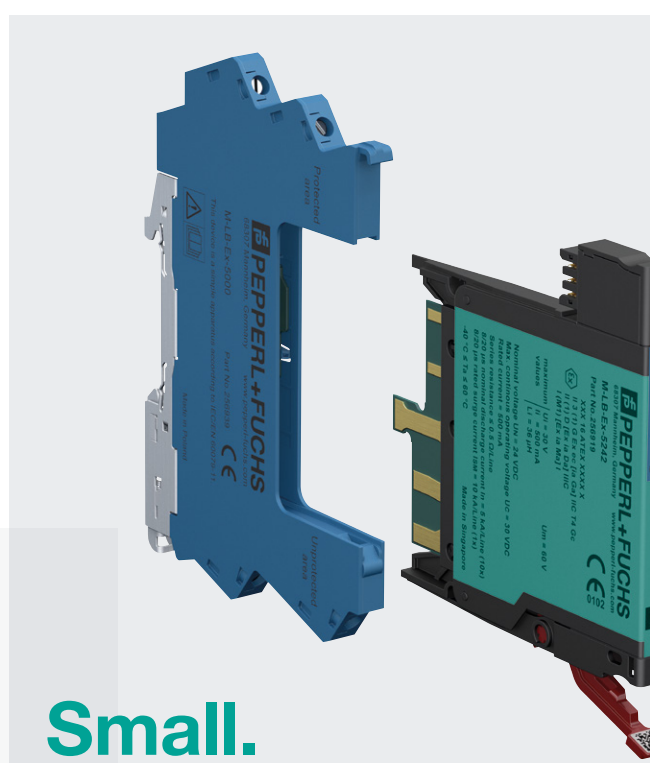
DIN-rail-mountable surge protection for measurement and control signals was the basic requirement but by no means the biggest challenge. “It is the sum of the additional functions that makes the new surge protection module so special,” says Füll. “For our customers, surge protection cannot take up any additional space on the DIN rail. It must all be easily set up without special tools and must also indicate wear or failure on its own. Ideally, no expert knowledge should be necessary for maintenance—and a surge protection system should go practically unnoticed in the overall operation of the plant,” says Thomas Ofenloch, Development Engineer for Interface Technology at Pepperl+Fuchs in Mannheim. »



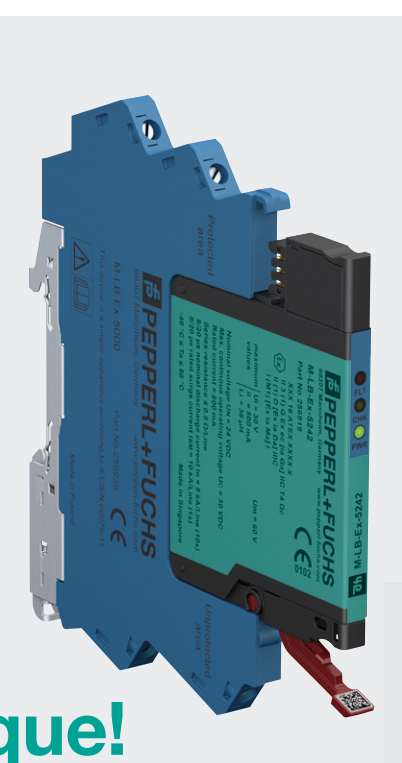
Learn more about the M-LB-5000 surge protection system.



Smart.



Small.



Unique!



Creativity was also required, so key issues were worked out in a series of brainstorming sessions, particularly with regard to integrating the required functions into a module that is just 6.2 mm wide. “Based on 20 years of experience, we have built up extensive expertise in surge protection complemented by long-standing expertise in explosion protection, analog technology, and interface modules,” says Lebkücher. What’s more, all the stops were pulled out: “Even during the design phase, we made video recordings with high-speed cameras to analyze the behavior of high-current contacts during a surge,” reports Project Manager Ofenloch. “With 50,000 images per second, it was possible to precisely identify every little detail, so we could build on this to optimize the number and arrangement of contacts.”

Close collaboration with colleagues at the production site in Singapore also played a key role in the successful development. “This was immensely important for the production-optimized development of the surge protection system,” emphasizes Ofenloch. And Lebkücher enthusiastically adds: “This module is one of the most sophisticated and innovative products that I have ever helped develop.”

*“This module is one of the most sophisticated and innovative products that I have ever helped develop.”*

Thomas Lebkücher, Head of the Mechanical Design Product Group, Process Automation



▶ Take a look behind the scenes at this exciting product development.

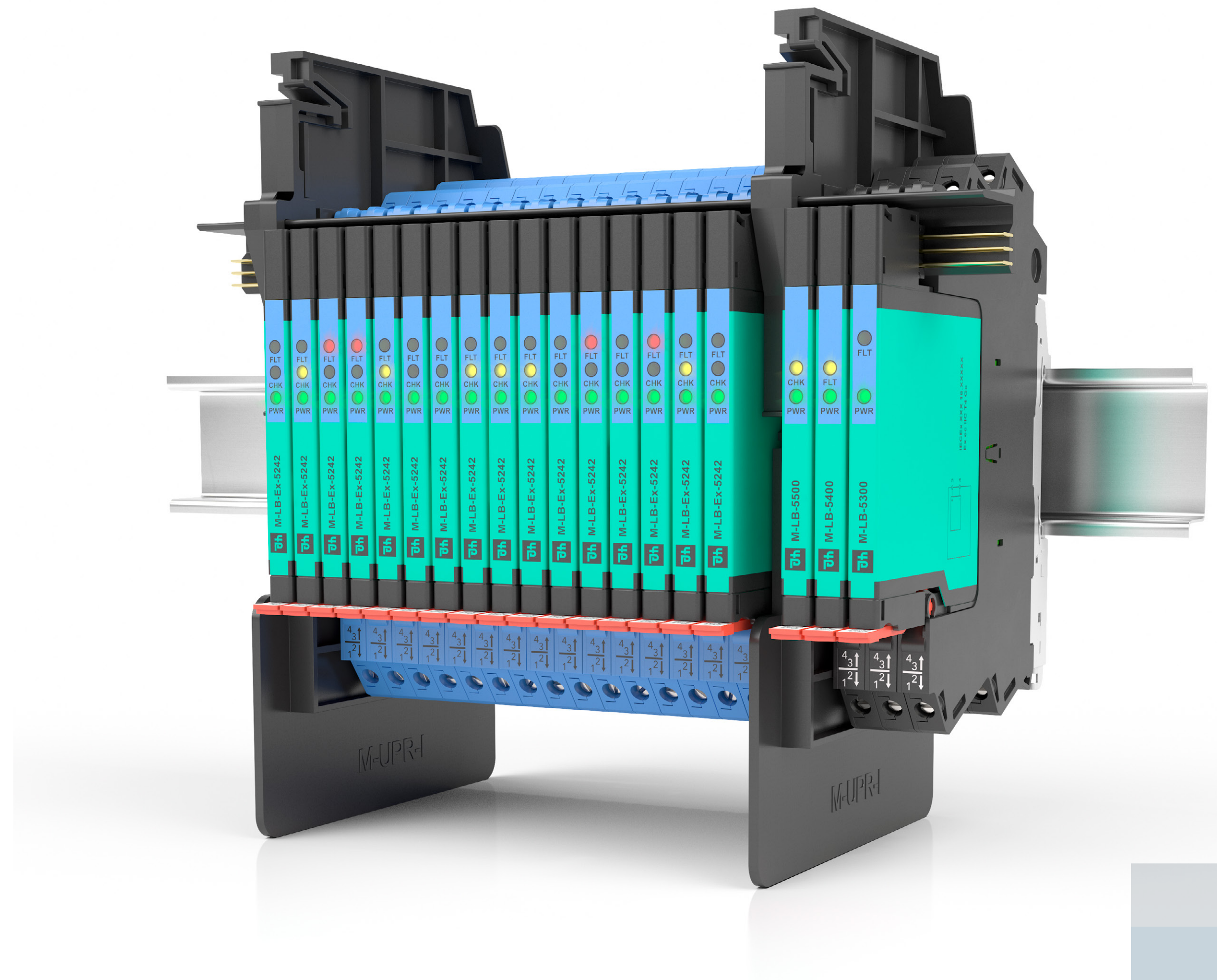
## Challenges Mastered Every Step of the Way

Even if some things didn't go according to plan, as is common in most development projects, perseverance has paid off. The whole team agrees: "We were able to overcome our challenges without having to make compromises. From system designers to service technicians—the new surge protection system offers advantages throughout the entire user chain. To know that something that was believed to be impossible is possible after all provides a big confidence boost for our next projects."

Since European users and standards bodies are also becoming increasingly aware of surge protection, it won't be long before a new set of challenges arises. ■

*"To know that something that was believed to be impossible is possible after all provides a big confidence boost for our next projects."*

Thomas Ofenloch, Development Engineer for Interface Technology



## The Benchmark in Surge Protection: The M-LB-5000 System

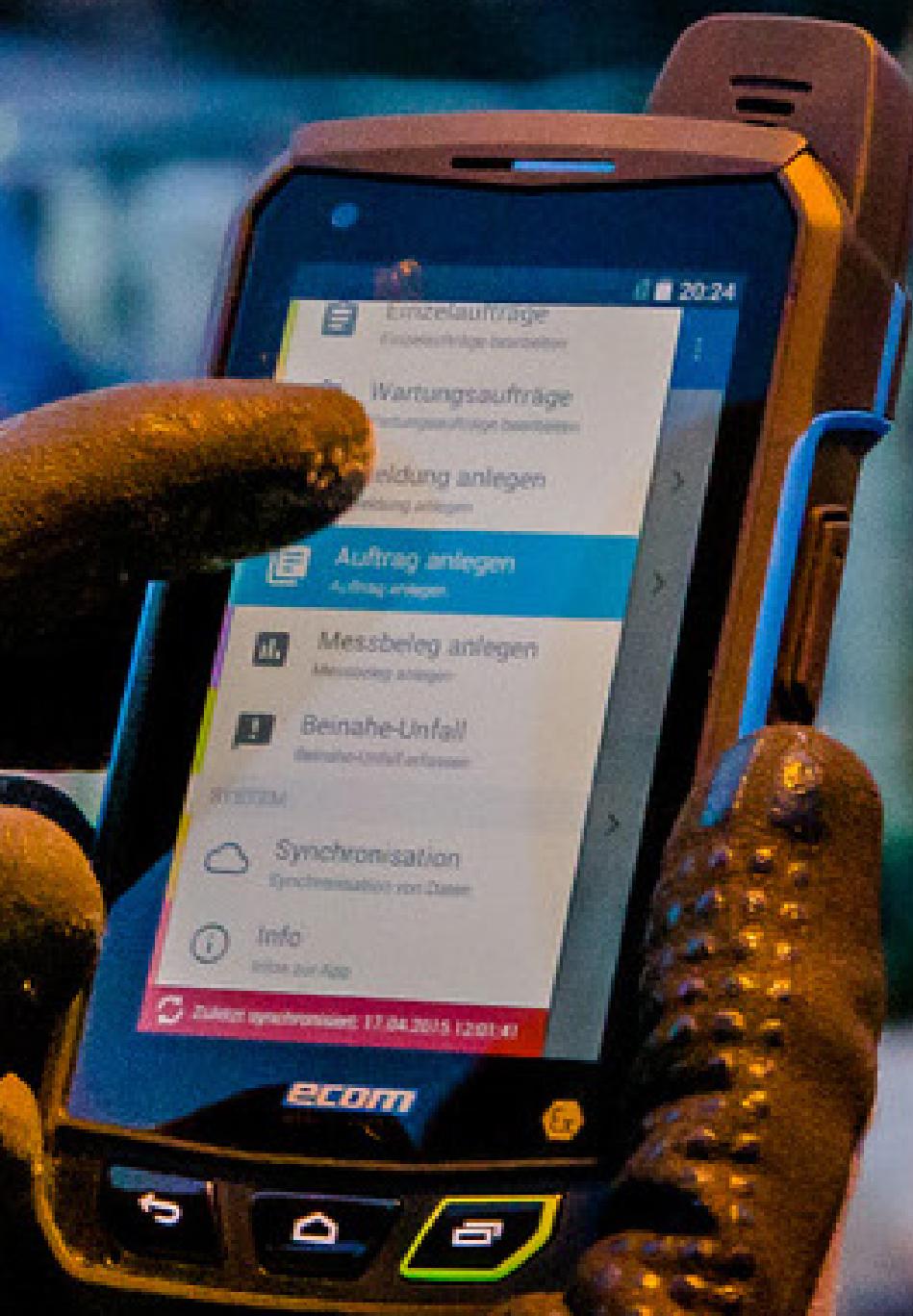
Surge protection in a modular design, packed into a space-saving housing and equipped with a patented diagnostic function—the M-LB-5000 system demonstrates cutting-edge technology in industrial surge protection. It consists of a base module that is integrated directly into the signal circuit and a plug-in protection module. At just 6.2 millimeters wide, both form an extremely narrow plug-in surge protection module. The integrated diagnostic function is also a unique feature—the module signals its own

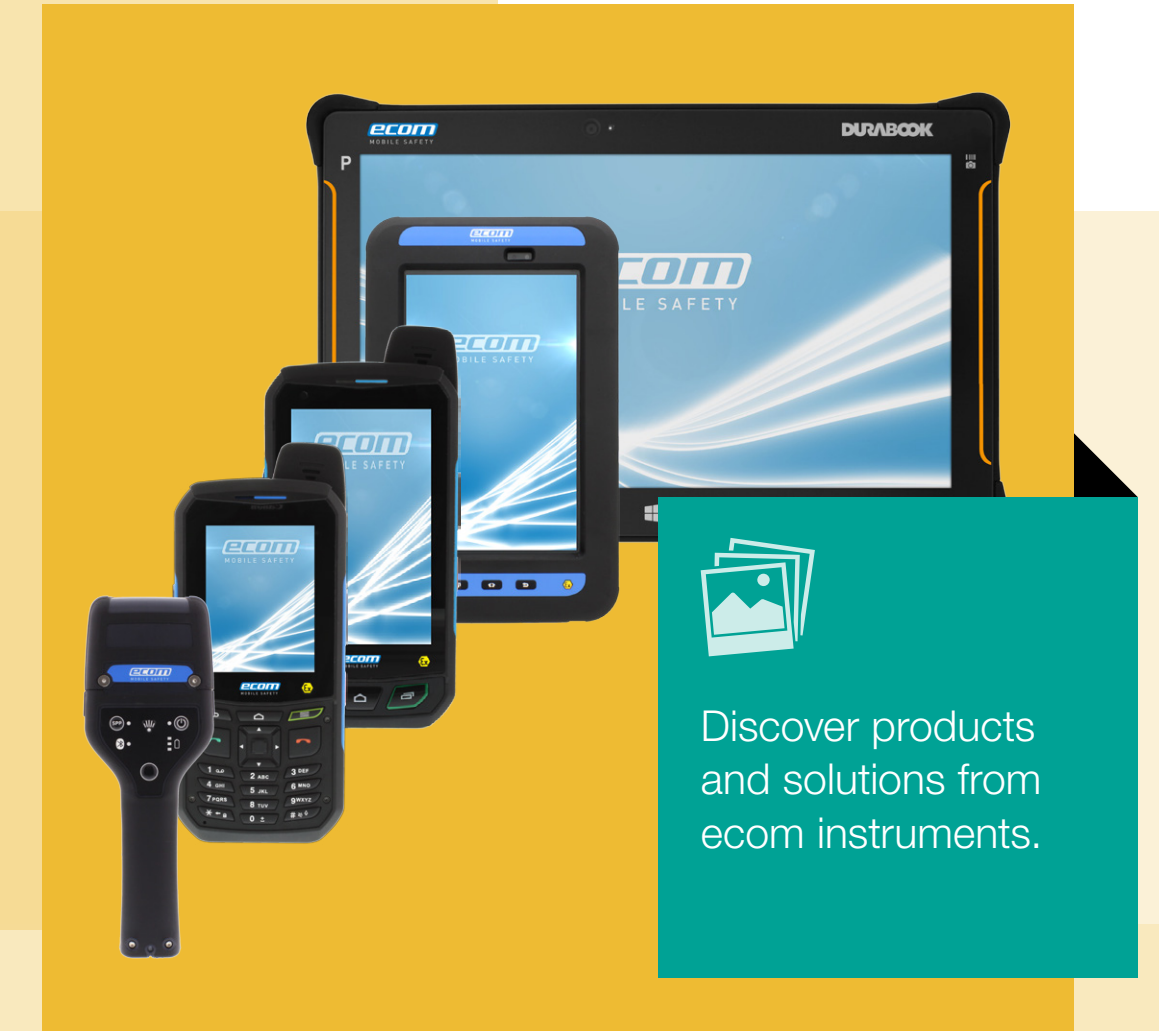
wear status both in the switch cabinet, via an easy-to-read traffic light indicator, and on the control panel, and gives a warning before a possible failure. This makes it easy to check the surge protection system in accordance with EN 62305-3, to significantly reduce product lifecycle costs, and to plan service calls in advance. An integrated isolation function makes it possible to run insulation testing during commissioning and to swap out modules during operation.



# HMI to go

With mobile devices from ecom instruments GmbH and stationary HMI solutions, Pepperl+Fuchs is now making end-to-end process visualization and control possible virtually anywhere in hazardous environments—opening up more process applications to Industry 4.0.





Smartphones, tablets, and other mobile devices have become our constant companions. Whether in the private or professional sphere, the ability to communicate digitally with the entire world, anytime and anywhere, creates countless advantages.

“Even around hazardous machinery and plants, there is demand for the ability to take advantage of the benefits of mobile digital devices,” confirms Rooft Wessels, Head of the Human Machine Interfaces Business Unit at Pepperl+Fuchs and now also Managing Director of Mobile Safety & HMI at ecom instruments GmbH which Pepperl+Fuchs acquired at the beginning of the year.

## Opening the Door to Industry 4.0

For over 30 years, ecom instruments, with headquarters in Assamstadt in Baden-Wuerttemberg, Germany, has been a pioneer and world market leader in mobile industrial equipment for hazardous areas: “We were the first manufacturer in the world to introduce to the market explosion-protected 4G mobile phones, smartphones, and tablets, among other things,” says Christian Uhl, Vice President of Marketing at ecom instruments.

Today, the global company is known for its robust and sophisticated solutions for mobile computing and communication—which made it the perfect partner for Pepperl+Fuchs: “This is an ideal addition to our own portfolio for process visualization and control,” explains Wessels. “We can pool expertise and offer our customers mobile and stationary operating devices for use in hazardous areas from a single source. In doing so, we are creating comprehensive, future-oriented solutions while opening the door for process automation to Industry 4.0.”



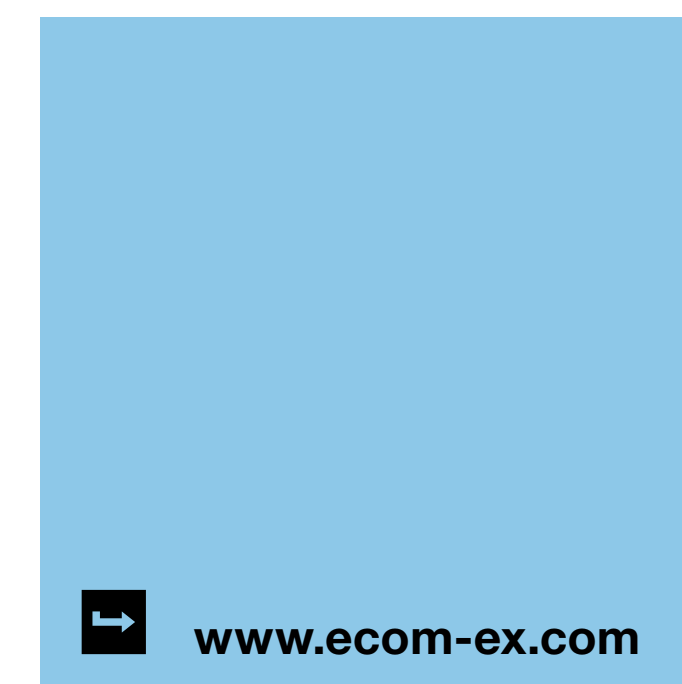
## Digital System Solutions for All Scenarios

The key to new, more flexible applications lies in the synergy between stationary remote monitors from Pepperl+Fuchs and mobile devices from ecom instruments. “It is an enormous benefit to customers that we can leverage our broad portfolio of technologies and interfaces to meet a wide range of industry demands, for instance when it comes to monitoring and control. Stationary terminals from Pepperl+Fuchs bring thin-client technology and sophisticated remote monitoring mechanisms into process plants. We complement this with mobile devices which make all the benefits of technologies such as 4G, Bluetooth, or GPS available in hazardous areas,” explains Uhl. “Our product lines offer the user the same ‘look and feel’ in hardware and operation, allowing seamless integration into the digital network of the overall system. The functionality of the terminals, smartphones, and tablets can be used fully. And customers receive a complete solution from a single vendor—with absolutely no risks in terms of compatibility or availability.”

### “Mobile Worker” Puts HMI System Concepts in Motion

ecom instruments developed the “mobile worker” concept for its digital mobile computing and communications solutions that are now joining the Pepperl+Fuchs portfolio. “It bundles explosion-protected smartphones and tablets, peripheral hardware such as headsets and docking stations, as well as intelligent software, applications, and service packages into comprehensive solutions for a variety of situations where flexibility is required,” says Uhl.

Typical applications include data collection for incoming goods, mobile control and monitoring, and the identification and verification of raw materials and formulas in storage and production. Providing work instructions to employees in the field or decentralized access to production data and process procedures are also part of the mobile worker concept. This all points to the digital future of process automation—people, processes, and systems will tap into networks to discover new dimensions of industrial value, in hazardous areas and beyond. “With Industry 4.0 in mind, we can now map and establish comprehensive and efficient condition monitoring through stationary clients and mobile devices,” says Wessels. “So the world of HMI is in motion, in every way.” ■



Explosion-proof smartphones and tablets roll off the assembly line in Assamstadt, Germany.



A large industrial furnace in a factory setting, pouring molten metal. The scene is filled with bright orange sparks and a glowing yellow-orange light from the furnace. Two workers in protective gear are visible in the background, one on the left and one on the right. The factory has large windows and industrial equipment.

# Melting Pot on the Indian Ocean

Whether it's the landscape, people, religions, colors, or spices—India is a country of unparalleled diversity. Since 2016, Pepperl+Fuchs Manufacturing (India) Private Limited in Chennai has been diversifying the Pepperl+Fuchs family and supplementing the value chain in the electrical explosion protection business with its own foundry.



*“With the new production site in Chennai, we are also implementing our stringent quality standards in the production of enclosures.”*

Hermann Best, Vice President of Global Sales Processes

➔ [www.explosionprotection.com](http://www.explosionprotection.com)



Exotic curry, the impressive Taj Mahal, colorful Bollywood: Anyone who has not yet visited India only has a vague idea of the second largest country in Asia. And yet, India has long been one of the most important business locations in the world. With a growth rate of 7.6%, the country was among the fastest expanding economies in the world in the 2015/2016 fiscal year. Although the majority of the population is still employed in the agricultural sector, a number of large industrial centers have developed in the land of colors and spices within the last few decades—such as Chennai, formerly Madras. Situated on the Indian Ocean, the city is dominated by the automotive sector, yet other important sectors such as the chemical and petrochemical industry have established themselves there, too. “Chennai is very industrial. A large number of metal processing plants and foundries that supply large local businesses have been set up in the city,” is how Hermann Best, Vice President of Global Sales Processes at Pepperl+Fuchs, describes the local environment. In 2016, after the acquisition of former Petroleum Safety Products Industries (PSP) in Chennai, Pepperl+Fuchs thoroughly integrated one of these plants into its own Group, and is now also implementing its stringent quality standards in the production of enclosures. 📄





## A Production Plant with Its Own Foundry Offers Perfect Conditions

The team at the new production facility in Chennai consists of approximately 100 employees who work mainly in manufacturing but also in production planning, engineering, and development. They currently design and manufacture enclosures and complete engineered solutions for India, Australia, and the Middle East. “This year, we want to modernize the facility as part of an ambitious investment project and expand it to a global scale which will allow the plant to supply further Solution Engineering Centers in our worldwide network with Ex d enclosures for end-to-end engineered solutions,” Best forecasts. “This will allow us to provide standards and quality for our customers in all parts of the supply chain.” This means that, in the future, Pepperl+Fuchs Manufacturing (India) Private Limited will be an important cornerstone for core components of the Pepperl+Fuchs electrical explosion protection portfolio. “The thoroughly modernized foundry and manufacturing facility will then mainly produce empty enclosures of protection type ‘flameproof enclosure’ (Ex d) in accordance with the latest standards, for processing on milling and turning machines immediately after casting,” is how Best describes the planned on-site manufacturing processes. “The enclosures will then be tested and put through pressure testing before a powder coating is finally applied to the surface.” At Solution Engineering Centers, the enclosures are then used as the basis for manufacturing explosion protection solutions that are designed on a customer-specific basis. »

*“We provide customers everything from a single source, from the foundry to the finished solution.”*

Hermann Best, Vice President Global Sales Processes



All work and processes are subject to the high internal standards that apply to all facilities within the Group. “This means that our customers can rely on the quality and safety they are accustomed to in our electrical explosion protection solutions,” sums up Best.

## More for the Customer

With its new facility, Pepperl+Fuchs is transferring not only its quality standards but also its in-depth explosion protection knowledge relating to the production and processing of Ex d empty enclosures. “The acquisition allows us to increase our vertical integration and develop additional capacity for the electrical explosion protection equipment business segment. This means that, in the future, we will be able to handle the needs and requirements of our customers with greater speed and with a more systematic approach.” A manufacturing facility with its own foundry was the missing piece of the puzzle for Pepperl+Fuchs in terms of production: “Now the entire value chain for complete solutions in electrical explosion protection is in our hands. We provide customers everything from a single source, from the foundry to the finished solution,” says Best. ■



Discover flameproof enclosures that will be manufactured in Chennai.



An aerial photograph of a vast industrial complex, likely a refinery or chemical plant. The facility is densely packed with hundreds of large, cylindrical storage tanks in various colors (white, grey, red). A complex network of pipes, walkways, and structural steel frameworks crisscrosses the site. In the background, there are several tall distillation columns and other industrial buildings. The surrounding area includes green fields and some residential or commercial buildings in the distance under a clear sky.

# Looking at the Bigger Picture Together

Extraordinary challenges are best solved as a team. Pepperl+Fuchs has been working with four companies from the IT industry, system automation, and process automation to develop a comprehensive solution that brings the Internet of Things and the benefits of digital Industry 4.0 technologies to the process industry.





Temperatures, fill levels, flow rates—this is typical information that field devices in process plants generate every second. These devices also produce endless additional data about their environment and condition, but such data has previously gone virtually unused. That's because, until now, most commonly used interface technology has not allowed such information to be transferred to the control room. How helpful would it be if all of this data were available centrally, and if it were used to automatically monitor field devices and plan condition-based predictive maintenance? In collaboration with four other companies, Pepperl+Fuchs is making this scenario a reality. Together with SAP, Hilscher, Endress+Hauser, and SAMSON, the company is paving the way for the Internet of Things (IoT) in the process industry. The aim is to improve the availability of plants with predictive maintenance and condition monitoring.

## Greater Plant Availability with the Internet of Things

“In the process industry in particular, plant monitoring is associated with demanding requirements since this industry is already complex to begin with,” explains Benedikt Rauscher, Head of Global IoT Projects at Pepperl+Fuchs. “Take for example explosion-hazardous areas or non-interruptible production processes. Unplanned outages can be fatal.” The five companies are working together to counteract this with their joint development efforts: the interaction between the components and systems means that defects and impending failures can be detected before they arise, and the need for preventive action can be automatically signaled. The basis of the solution is comprehensive networking both within the plant and beyond. »



SAP, Endress+Hauser, SAMSON, Hilscher, and Pepperl+Fuchs: The five partner companies talk about the joint development project in a video.



Left to right:

Benedikt Rauscher, Head of Global IoT Projects, Pepperl+Fuchs

Guido König, Senior Technology Manager Business Innovation, SAMSON

Michael Bückel, Product Manager Platforms, Endress+Hauser


Armin Pühringer, Business Development Manager, Hilscher

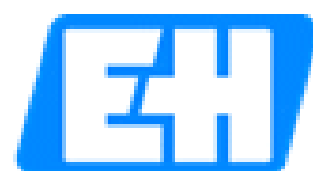
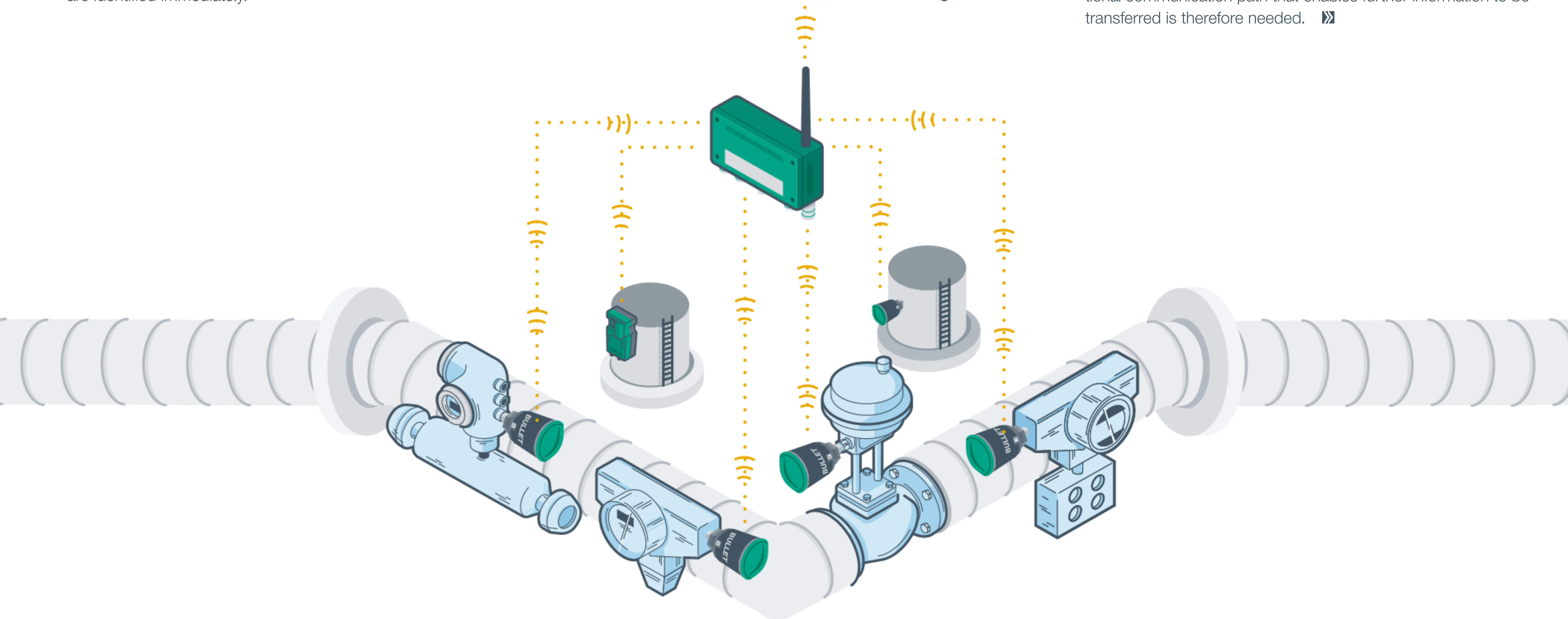
Timothy Kaufmann, Business Development Manager Internet of Things, SAP

## Full Cloud Cover

The hub of the solution is SAP Asset Intelligence Network (AIN) in the SAP cloud platform. All the relevant data and information is stored here for each component. This produces a digital image of the whole plant, and the image is available at a central point with all the key information. AIN regularly compares the saved structures with the actual condition so that errors and deviations are identified immediately.



Such condition monitoring and predictive maintenance requires the additional operating data from field devices. Flow measurement devices from Endress+Hauser and control valves from SAMSON, for example, continuously supply valuable additional information. This information allows conclusions to be drawn regarding coating formation, corrosion, or mechanical wear. But conventional 4 ... 20 mA interface technology only permits a single value to be transferred to or from a field device. An additional communication path that enables further information to be transferred is therefore needed. 





## More Data and More Paths Mean Added Value

To make this possible, Pepperl+Fuchs equips field devices with the BULLET *WirelessHART* adapter, enabling wireless communication parallel to the 4 ... 20 mA current loop. The benefit for the process industry is that the BULLET in a robust Ex d enclosure is also suitable for explosion-hazardous areas. So it enables continuous communication through to the hazardous area. The adapter transfers the recorded data wirelessly to a *WirelessHART* gateway which in turn communicates directly with the SAP cloud via an MQTT protocol. The valuable additional data is therefore also transferred reliably to AIN and is available there centrally. Alternatively, the data can be transferred to the cloud using a wired connection via the netIoT Edge Gateway from Hilscher. AIN processes all the information clearly and signals a possible need for action to the user. Based on this, further applications can be added that process the data for other purposes, as required.

## Limitless Networking

In addition to continuous communication from the field level through to the cloud, the developed solution offers the particular benefit of networking beyond the physical boundaries of the company. This is because not only the plant operator but also manufacturers and service providers can access certain areas of AIN. This enables new service models that could be used to better plan maintenance and inspection schedules or optimize delivery dates. At the same time, manufacturers can supply all the relevant information for the operator about the individual components within the network.

## Minimum Work, Maximum Benefit

The joint solution fits seamlessly into the processes, with minimal installation work required. Existing plants can easily be retrofitted with the BULLET *WirelessHART* adapter without having to completely shut down the system. The particular benefit for

customers in the process industry is clear: “The use of innovative Industrial IoT technologies such as this enables predictive maintenance and condition monitoring so that impending failures can be identified in time and appropriate preventive action can be taken,” sums up Rauscher. “This not only improves plant availability but also ultimately saves costs.” The comprehensive solution from SAP, Endress+Hauser, SAMSON, Hilscher, and Pepperl+Fuchs thus makes data continuously available and helps improve efficiency in process plants. ■



Find out more about the BULLET *WirelessHART* adapter.

➔ [www.pepperl-fuchs.com/news-bullet](http://www.pepperl-fuchs.com/news-bullet)

# People Make the Difference

Digitization, the Internet of Things, Industry 4.0—keywords that are pervasive and hotly debated. Again and again, the question arises of what this means for the workplace of the future. With Christian Schwöbel, Head of Global Technology Management and Production in Mannheim, Benedikt Rauscher, Head of Global IoT Projects, and Till Hoffmeyer-Zlotnik, New Business Development Sales Engineer, we have brought together three employees from different areas at Pepperl+Fuchs to exchange their views.





Everyone is talking about the “digital revolution.” What does this mean for the workplace and what is hidden behind the big keyword “digitization”?

**Christian Schwöbel:** First of all, it must be said that we already live in a digitized world. Think of video conferencing: that we are able to see colleagues in production facilities on the other side of the world on a screen, is only possible thanks to digital technology. In the same way, processes such as vacation requests take place electronically in companies today—this is also digitization. Such digitized workflows are also found in production. For example, there is increasingly the possibility to make status and process results available and able to be evaluated in digital form. For us in-house, this is actually already commonplace. So it is not the case that yesterday everything was analog and today it is digital. We only notice it more, simply because more and more is being digitized, and digital technologies are penetrating more and more areas.

**Till Hoffmeyer-Zlotnik:** In sales, this is shown by the simple example of how we communicate with customers today. In the past, a written request arrived by mail that was electronically recorded and edited by an employee, and then a written quotation was sent. Today, the request itself is digitized, and you do not need to be in direct contact with people but rather with software. Continuing along this line, the person in such processes perhaps has at some point taken more of a supervisory function. Think of orders for large online retailers: from receipt to shipping, today, all information and interactions run through software and systems—the process is not controlled by people. In future scenarios in the industry, one machine will place the order of your spare part directly with another machine.

**Benedikt Rauscher:** Exactly, an important change in the industry is coming our way—provided that we are creating the technological basis for it. Today, we have a kind of “Internet of people”. This means that a person provides information on the Internet. In the “Internet of Things”, it is no longer the person that provides the information, but the machine itself—and for another machine. Naturally, this has an effect on the way we work.

**How does the vision of Industry 4.0 fit into this?**

**Benedikt Rauscher:** Industry 4.0 uses the Internet of Things to make processes and workflows more efficient. Machines should be able to communicate with each other in a plant and even beyond the walls of a company. Processes such as ordering a spare part don’t then need to “detour” via a third point, which saves a lot of time. Such a message could be “I am almost finished with component A and am sending it to you for further processing.” This will speed up the processes because employees do not need to first record and enter a status and initiate or control further steps, but instead much more is automated.

**Does this mean that, at some point, we will no longer need people in production?**

**Christian Schwöbel:** The scenario of the human-free factory is raised again and again but has still not occurred, and I don’t believe that it will. Of course, the topic of digitization in production is also about automation. Steps and processes should be linked together so that machines work independently or communicate with each other, because people will most likely play a different role in the future. But this does not mean that people will no longer be needed. On the contrary: tasks are, in my opinion, much rather complex. The cognitive abilities of people will be essential in the future, because you must also be able to deal with the systems. »



*“Machines should be able to communicate with each other in a plant and even beyond the walls of a company.”*

Benedikt Rauscher  
Head of Global IoT Projects



**Benedikt Rauscher:** These skills cannot be replaced by a machine or a robot. But such developments may support people and streamline processes, meaning that the person can focus on other tasks. Let's take sales as an example again. If machines regulated standard orders themselves, employees in sales would have time to handle more "creative" things.

**Till Hoffmeyer-Zlotnik:** They will also need the extra time because digitization will lead to changes in customer requests and needs. While the customer previously looked at what the market had to offer and then requested a component such as a proximity switch, today, the customer comes to the company with a concern that they want to resolve without emphasis on a particular product. Industry 4.0 awakens the needs of customers, and sales receives the bouquet of needs. Experts who can deal with such requirements and develop solutions specifically for these needs are imperative in companies.

**So, do these developments also have an effect on sales?**

**Till Hoffmeyer-Zlotnik:** Absolutely. Today, we work in fixed structures. With requests for solutions and products that are tailored to the needs of our customers, this is likely to increasingly change to working in and on projects—across company divisions. As individual as the customers' wishes in the context of the digital transformation are, the sales approaches must be equally individual and unique. At the same time, this means that departmental boundaries are blurred. However, the introduction of new technologies such as virtual reality also has an influence on work. Field service employees will perhaps meet with customers in virtual space at any time instead of traveling to them—such future scenarios are also conceivable.



*“Right now, we can only speculate about the jobs of tomorrow.”*

Christian Schwöbel  
Head of Global Technology Management  
and Production in Mannheim

**What does digitization mean for a company like Pepperl+Fuchs and its structures?**

**Christian Schwöbel:** We can assume that various areas will become even more intermeshed in the future. Sales, product management, development, and, last but not least, production will be enhanced in the future and work more closely together. If you accept that the products and solutions will be increasingly customized and even individually produced, you will see that it is just not possible any other way. Areas may also come together that previously had never come into contact.

**Benedikt Rauscher:** In my opinion, communication and teamwork will therefore have much greater significance in the future. Because as much as we digitize, we will still need to talk and work with each other—and even more so than ever. Individual business units or even different companies must come together, using their combined expertise to create a solution, particularly with complex projects. Social skills therefore gain importance in the process of digitization rather than becoming less important, as some might assume. »



... and for the individual workers?

**Benedikt Rauscher:** Undoubtedly, more flexibility will be required of us in the future with regard to what the tasks are and the way we work. We need to be open to new things. “Lifelong learning” is a good keyword here, because it will probably not be the case that you can perform the same task for your whole career. Job tasks are also changing alongside technological advances.

**Christian Schwöbel:** But one thing is certain: people are and remain important, and are in fact more important than ever. Because after all, it is people that address, implement, and then maintain developments such as those needed for Industry 4.0 scenarios. It should also be borne in mind that a complex development lies behind all of the simplicity that so much technology offers. Right now, we can only speculate about the jobs of tomorrow.

**Till Hoffmeyer-Zlotnik:** Digitization can also create more flexibility for the individual, when, for example, it is no longer necessary to be on-site, because the work can be accomplished from anywhere via the Internet. However, the existing rules in the company must be reconsidered for this, starting with the workspace and concluding with the time model. So digitization not only affects production and sales, but the whole company.

**Benedikt Rauscher:** Digitization is actually also a change process. It is not just about developing digital technologies. Learning to deal with more and more digital technology and using it to our advantage is ultimately the big change facing us all. ■

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*“As individual as the customers’ wishes in the context of the digital transformation are, the sales approaches must be equally individual and unique.”*

Till Hoffmeyer-Zlotnik  
New Business Development Sales Engineer

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# Lateral Thinking Required

Innovation—a keyword that is used all the time in the context of Industry 4.0. According to Duden, it means the “realization of a new, advanced solution for a specific problem.” But how does an innovation come to life? At Pepperl+Fuchs, there is a team dedicated to finding new solutions relating to Industry 4.0. Take a behind-the-scenes look with us.



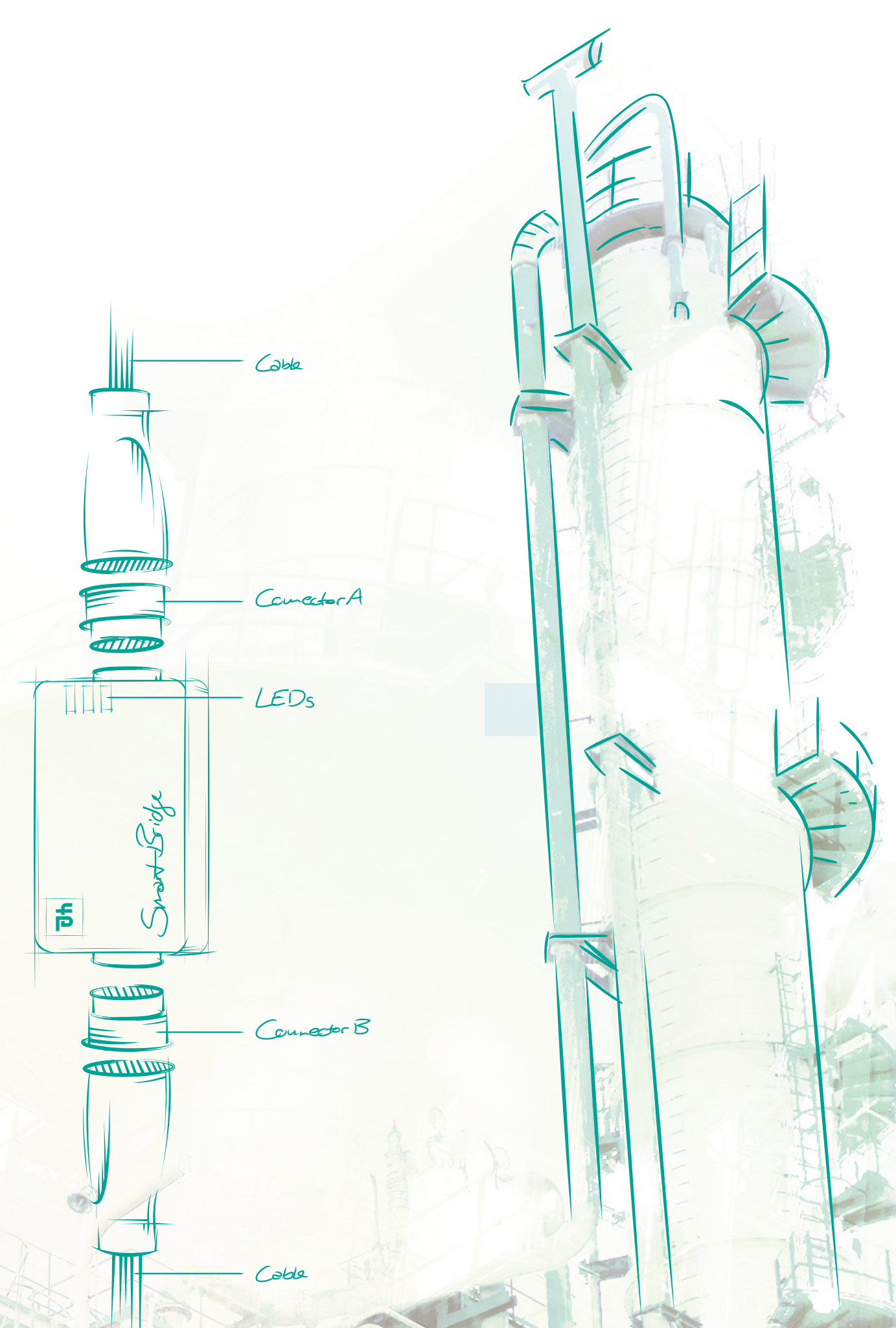
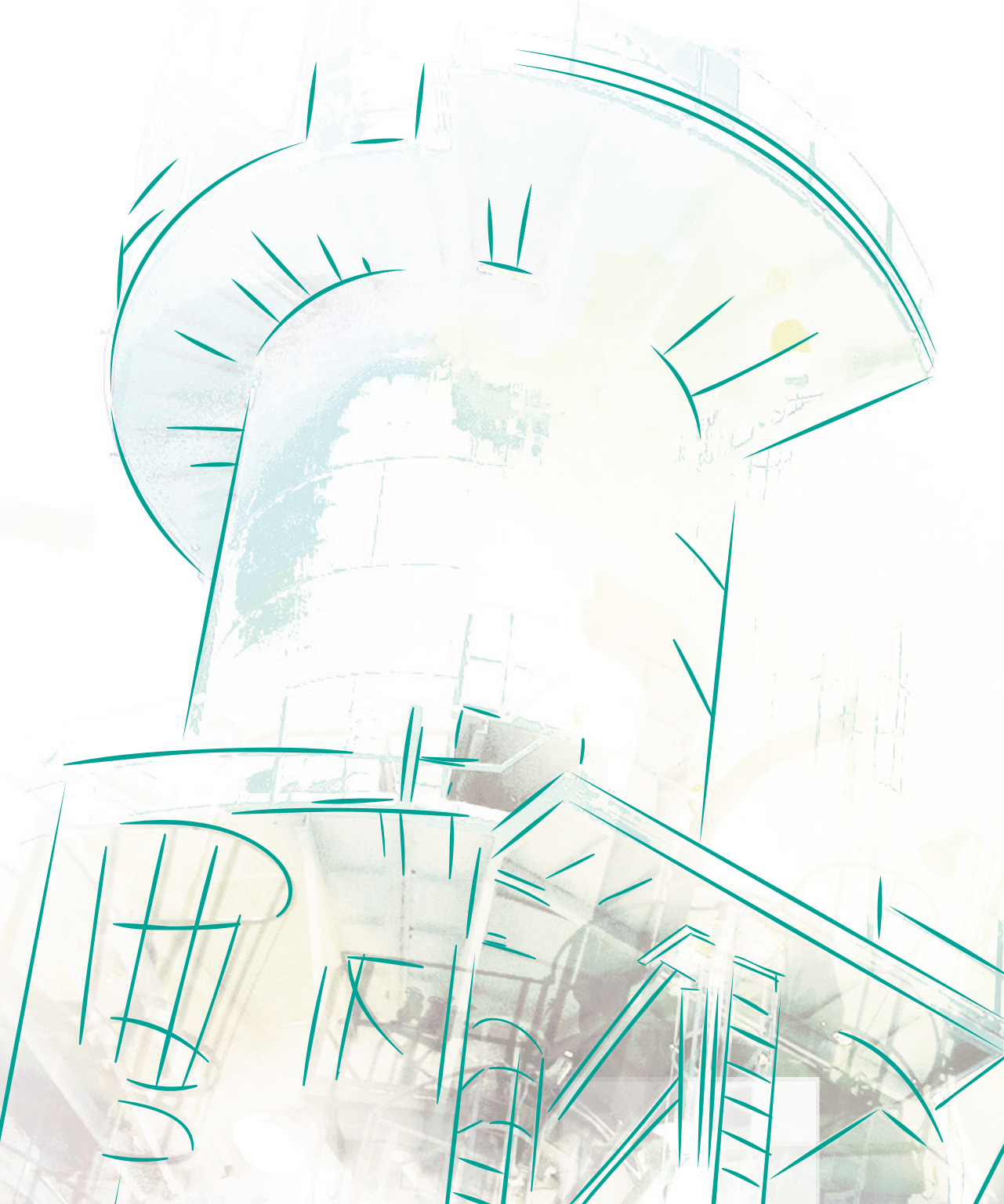


“Creativity isn’t something that you can switch on and then off again after an hour,” says Michael Bozek when asked if his activities still leave time for creativity. Together with the team leader Benedikt Rauscher, he is working on approaches for future Industry 4.0 scenarios. His work rarely focuses on a single product; to the contrary, much more holistic solutions are in demand today. With this in mind, Pepperl+Fuchs has created an overarching “Industrial Internet Solutions” team that operates outside of the business units and draws on

expertise from each of the product areas. But how do they develop innovative approaches? The ideas for new applications come from a wide variety of situations.

When, for instance, Rauscher and Bozek exchange views with industry experts and market competitors through activities in organizations such as the VDI or the ZVEI, it always inspires new ideas. “When we meet with like-minded people who are working on the same future scenarios as us, we get an ever-increasing picture of where the journey

can go and what solutions will be needed,” says Bozek. “Sometimes, you have an idea in mind, but sometimes a concrete concept only comes after a discussion with colleagues.” That is why cooperating closely with the product groups at Pepperl+Fuchs is just as important. Product development itself is not one of the tasks of the innovation teams; instead, they look at technologies across the board and consider how they can be used innovatively in new applications. »



**Benedikt Rauscher**  
Head of Global IoT Projects



**Michael Bozek**  
Product and Business Development Manager for Industry 4.0



## Envisioning the Future Together

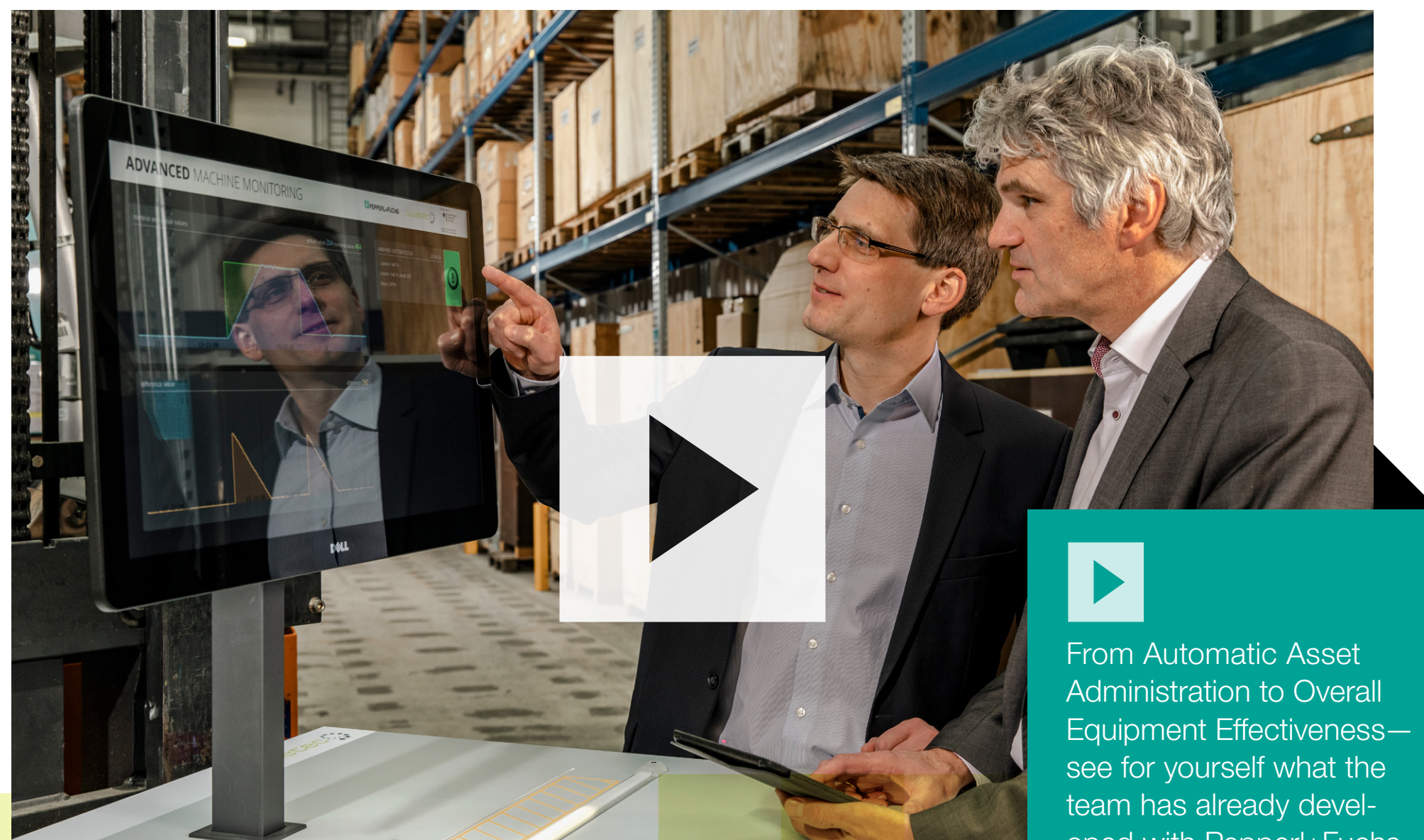
As part of their work on associations and committees, Bozek and Rauscher also work with representatives from other organizations to build the foundation for a vision of Industry 4.0. For example, in order to network plants thoroughly permanently, components need to have a common “language”. “At the moment, there is a multitude of technologies. We must create a common technological basis,” explains Rauscher. “We hope that at some point the same applies for a sensor as for a USB stick. You connect it and it runs immediately, no matter where it is or which company is using it.”

IO-Link is an important part of such visions. An important step in this direction was implemented this past year: with the IO-Link community, Pepperl+Fuchs has established IODDfinder—a database that makes all the files necessary to integrate IO-Link sensors available centrally. “Where users previously had to search for a sensor manufacturer, today, they can find over 3,500 products from 40 companies in one place,” reports Bozek. “This makes it much easier to find these files and to integrate IO-Link sensors into the digital image of a plant.”

## “Industry 4.0 Won’t Work without Cooperation”

Generally speaking, the user’s benefit is always the focus. That’s why the innovation team develops complete IIoT solutions with partner companies, in addition to working on standards. Such collaborations are of growing importance in the course of industrial change. “Consortia are being formed to pool the core strengths of individual companies,” explains Bozek. This provides customers exactly what they need to prepare their plants for the future, without having to seek solutions from different places. “For us, but also for other companies, this is a whole new form of cooperation,” Rauscher adds, “and it is the right way forward, because Industry 4.0 won’t work without cooperation.”

Bozek and Rauscher are now well connected, both within the company and outside of it. So they know who their best contact is for each solution and who to bring on board. At the end of the day, the result is not just innovative approaches that contribute to the end-to-end networking and communication of machines and plants—but also valuable partnerships. ■



From Automatic Asset Administration to Overall Equipment Effectiveness—see for yourself what the team has already developed with Pepperl+Fuchs partners.

➔ [www.pepperl-fuchs.com/news-sensorik40](http://www.pepperl-fuchs.com/news-sensorik40)

➔ [www.io-link.com](http://www.io-link.com) → IODDfinder

# Material Flow with Vision

The stacker cranes are constantly in motion. They flit back and forth non-stop between the racks, where the constant stream of boxes briefly comes to a stop. The tireless machines in the Global Distribution Center (GDC), which opened in 2016 in Singapore, are more than just technical assistants.



“Logistics automation in the Mannheim headquarters was a pioneering achievement over twenty years ago, but the technology from that time just reached its limit at some point,” explains Logistics Manager Markus Külken. “Also, more space was required, and procedures needed to get significantly faster to keep pace with the growth of the business. So we decided to build a new distribution center with the highest possible level of automation.” The tried-and-tested technology from Mannheim was subsequently implemented internationally with great success.

## Same but Different

At first glance, you can hardly tell whether you are in Mannheim or Singapore, since the two distribution centers look amazingly similar to each other. The new American equivalent, the US Distribution Center (UDC) in Houston, will be opened this year with the same “look and feel”. The similarity of the centers is of course not a coincidence. Mannheim has served as a model for proximity to customers and reliable delivery. Based on this, the structure and technology were transferred to Singapore and Houston and developed further. An important component is automated small parts storage in high racks. There, the goods are stored in boxes on trays, which are transported by fully automated stacker cranes to the required place. Based on the goods-to-man principle, they go to the workspaces on roller conveyors. Of course, Pepperl+Fuchs products complete the central tasks of acquisition, control, data transfer, and testing in all distribution centers, and therefore prove their value again and again in logistics applications.



More impressions  
of our Global  
Distribution Center

## Fully Automatic Storage

In addition to the state-of-the-art automation technology, the main difference between the new and old storage systems is a comprehensive warehouse management system (WMS). It is integrated into the company-wide enterprise resource planning (ERP), displays individual processes in much more detail than in the past, and can control entire logistics processes. In addition, all Pepperl+Fuchs locations are now integrated into the material flow more consistently, as Külken explains: “Each box that leaves one of our production sites gets a ‘number plate’ in the form of a barcode. It stores the material and quantity and can be matched with the code in the system. If the box arrives at one of the three distribution centers, it is now automatically inventoried and stored.” Only in the case of deliveries from external companies is human intervention needed—for now, because we are in talks with suppliers about how their boxes can be incorporated into the automated system.

## Humans in the Midst of Automation

Employees are primarily involved in picking the goods, where individual orders are compiled and packaged. Light signals, which indicate the requested parts, assist them in repacking the goods from warehouse boxes into the shipping boxes. This technical assistance, also called pick by light, reduces search times and the error rate, and supports the employees’ concentration. If possible, however, the full bin retrieval principle is used: even in production, the packaging sizes are matched to various customer requirements, without human intervention. ▶▶

## Ideal Conditions in Singapore

The amount of time saved just by automatic storage is explained by the director of the GDC in Singapore, Han Thanh Hong: “Previously, when a 40-foot container was delivered, we needed two days to inventory the goods and transport it to the racks. Today, we can do it in three hours.” The structure and technology of the Mannheim logistics center was not applied one-to-one in the GDC. “We used the experiences from Germany and developed the system further. The updated version was then transferred back to Mannheim after the introduction in Singapore, so that we are now at the same, improved level.”



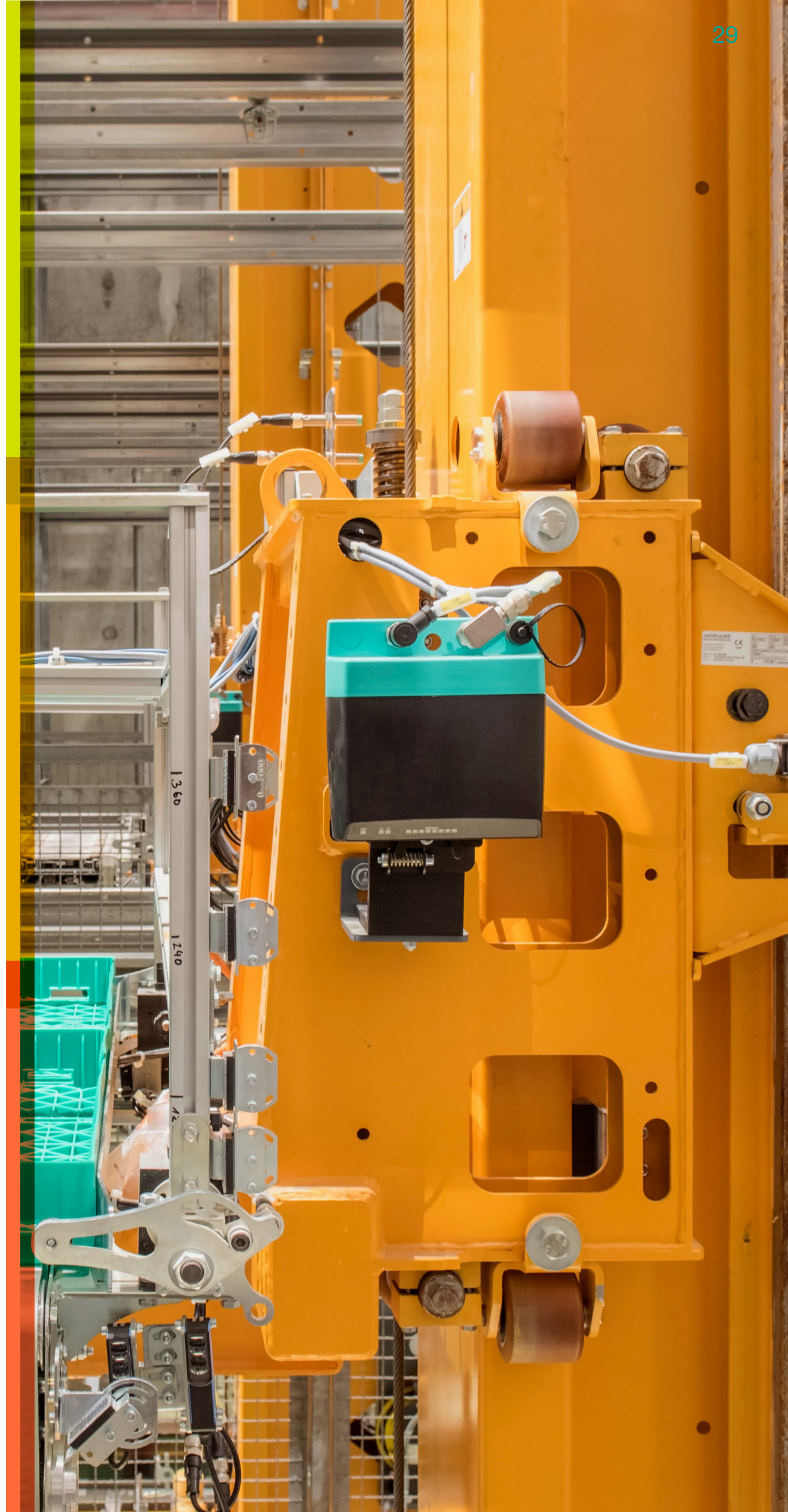
Join us on a video tour through the European Distribution Center!

The starting position in Singapore was similar to Mannheim. The old logistics center was bursting at the seams, and accelerating the processes was becoming more and more urgent. 80 percent of Pepperl+Fuchs products come from locations in the city-state as well as Vietnam and Indonesia. So it was obvious that the new global distribution center should be built in the Southeast Asian region. “Singapore, with its modern infrastructure and traffic connections, business-friendly regulations, and good conditions for import and export transactions, offered the best environment,” said Han Thanh Hong.

## Refining What Has Been Tried and Tested

Structure, technology, and the “operating system” in Houston are in line with the other two centers. The new UDC there will first serve the North and also later the South American market. “We can also use it as a regional showroom for our logistics products,” says Külken. “We can demonstrate the performance of our sensors in operation to interested customers there.” What will benefit customers most, however, will be quicker, more reliable delivery, which will be made possible by the optimized, high-quality logistics processes. Incidentally, these are subject to a continuous improvement process, known within the company as LOOP (Lean Operation and Organization in Processes). “This process may reveal that an additional tool at a specific workspace can save a lot of time,” explains Külken.

The storage facilities have also been able to take the next steps toward digital transformation. “Thanks to the high level of automation, ‘digital logistics’ is tangible and can be integrated into ongoing processes. With constant access to all data and different possibilities for fine-tuning, the processes in our distribution centers also conform to the principles of vertical and horizontal networking. The dynamic maintenance management is already making real-time data available to intelligent systems—be it the information from motors and brakes on the stacker cranes or the photoelectric sensors on shuttle cars. These forecast models allow machine learning and thus pave the way for predictive maintenance, which will significantly reduce sudden failures,” says Külken. ■



## EVENTS 2017

May

05

**Offshore Technology Conference (OTC)**

May 1–4 // Booth 1105 // Houston, Texas, USA

**Iran Oil Show 2017**

May 6–9 // Booth 1331 // Tehran, Iran

**2nd ISA UAE Automation Conference and Exhibition 2017**

May 16–17 // Abu Dhabi, United Arab Emirates

**XXI Automation Conference**

May 16–17 // Rytko koło Nowego Sącza, Poland

**SMART Automation Austria Linz 2017**

May 16–18 // Hall DC, Booth 0224 // Linz, Austria

June

06

**Intec 2017**

June 1–5 // Booth 301/302/280/281 // Coimbatore, Tamil Nadu, India

**Honeywell Users Group Americas 2017**

June 18–23 // San Antonio, Texas, USA

August

08

**AUTOMATION 2017**

August 9–12 // Booth H1 // Mumbai, India

**FENASUCRO**

August 22–25 // Booth 29C // São Paulo, Brazil

October

10

**Emerson Global Users Exchange**

October 2–6 // Minneapolis, Minnesota, USA

**Automaatio 17**

October 10–12 // Helsinki, Finland

**OTD2017 Stavanger**

October 17–19 // Booth E-4408 // Stavanger, Norway

**KORMARINE 2017**

October 24–27 // BEXCO, Busan, Korea

November

11

**AUTOMATION FAIR 2017®**

November 15–16 // Houston, Texas, USA

**SPS IPC DRIVES**

November 28–30 // Hall 7A, Booth 330 // Nuremberg, Germany

**MCS MEASUREMENT & CONTROL SHOW 2017**

November 29–December 1 // Tokyo, Japan

## Impint

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