

# PRESS KIT SPS 2019

You can find Pepperl+Fuchs in hall 7A, booth 330.

Our press releases:

## Company Profile

### Factory Automation

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3. **IO-Link master with OPC UA – Seamless Communication from the Field Level to the Cloud**
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**Pepperl + Fuchs as specialist for customized solutions using the example of montratec**

We would be very pleased if you continue publishing our press reports in your magazine. Should you have any question or if you are interested in a special subject, please do not hesitate to contact us.

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November 2019

# Company Profile Pepperl+Fuchs



*Location Mannheim*



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**Managing Directors:** Dr.-Ing. Gunther Kegel, Werner Guthier, Mehmet Hatiboglu

**Year of foundation:** 1945

**Reporting year 2017:**

**Turnover:** 670 Mill. Euro (consolidated external sales)

**Employees:** 6.200 worldwide

**Divisions:** Factory Automation, Process Automation

**Manufacturing plants:** Germany, USA, Singapore, Hungary, India, Indonesia, Vietnam, Czech Republic

**Subsidiaries:** more than 40 companies on 6 continents

**Main target markets:**

**Factory Automation:** machine building industry, automotive industry, material handling and logistics, printing and paper industry, packaging machinery, process equipment, door/gate/elevator construction, textile industry, renewable energies

**Process Automation:** chemical and pharmaceutical industry, oil and gas industry including offshore and marine, power industries, water and waste water

**Core products****Components for the Factory Automation:**

the sensor types inductive, capacitive, ultrasonic, photoelectric, rotary encoders, identifications systems, barcodes, data-matrix-codes, vision sensors

**Components and solutions for the Process Automation:**

interface modules, remote I/O systems, fieldbus infrastructure techniques completed by based around enclosures in the increased safety, intrinsic safety and flameproof protecting classes with approvals for the integration of a wide range of electrical apparatus, level control devices, Ex-operating terminal systems, electrical explosion protection equipment, Ex-IPCs, seminars teachware and services

Mannheim, November 2019

Career: If you want to learn more about career opportunities at Pepperl+Fuchs please visit our career portal [karriere.pepperl-fuchs.com](https://karriere.pepperl-fuchs.com). Our contacts will be pleased to assist you.

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**At a glance:**

- Wilsen.sonic.level for the IoT sensor from Pepperl-Fuchs

## Using the Internet of Things for Fill-Level Monitoring and Mobile Container Positioning

**The Wilsen.sonic.level sensor system provides a solution that allows the fill levels of containers, tanks, and silos to be monitored and managed remotely.**

**Pepperl+Fuchs presents an IoT sensor with integrated ultrasonic measurement for determining fill levels. The data is recorded at regular intervals and uploaded to the internet along with the current geolocation. The autonomous wireless sensor is battery-operated and can therefore be used in mobile containers.**

With the Wilsen.sonic.level, Pepperl+Fuchs has developed a sensor concept that is suitable for use in a variety of different wireless networks. For example, there is a product version with a GSM(2G) interface for public mobile networks. Another version of the product has a LoRaWAN interface for using privately operated low power wireless networks. All of these radio interfaces are used to transmit sensor data to the internet. Depending on the wireless standard selected, an appropriate remote location is available on the internet for the incoming sensor data. For example, LoRaWAN devices can send their telemetry data to the network and application server of any LoRa network operator. When using the public GSM mobile wireless standard, the Wilsen.service middleware acts as a secure remote location for receiving and forwarding the telemetry data from the sensor. The system concept of the Wilsen.service not only handles the decoding and the targeted forwarding of the sensor data, but also offers secure and convenient device management. This is particularly advantageous if a large number of IoT sensors will be used in later practical operation and if logging into the wireless network and assigning the right users needs to be as automated as possible. Furthermore, Wilsen device management enables automated application parameterization of

IoT sensors and a structured roll-out for software updates to ensure that even large numbers of IoT sensors in the field are kept up to date. The WILSEN concept provides a modular IoT system to which individual components such as sensor modules, network nodes, middleware, and data processing can be added.



IoT sensor WILSEN.sonic.level

Key words: WILSEN, Internet of Things, IoT, IoT sensor, wireless sensor, ultrasound, level sensor, level management, remote monitoring, smart level, smart city, smart industry, smart logistics, sensor data platform, data security, device management, LoRa, LoRaWAN

Author: Michael Bozek

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#### **At a glance:**

- R2300: multi-layer scanner for 3-D object detection
- Space-saving design especially suitable for intralogistics, mobile equipment, and robotics
- The finest angular resolution in its class enables detection of intricate objects
- Pulse Ranging Technology (PRT) guarantees precise measurement results
- Individually configurable measurement windows
- Sensor design reliably protects against "optical short circuits"
- Data output as raw data via Ethernet interface

## **Reliable Object Detection with 3-D LiDAR Multi-Layer Scanner**

### **The R2300 from Pepperl+Fuchs Impresses with its Precise Measuring Technology and Performance Tailored to its Application**

**At the 2019 SPS trade fair in Nuremberg, Pepperl+Fuchs, the world's leading manufacturer of industrial sensors and sensor systems, will be presenting the new R2300 multi-layer scanner. The sensor for 3-D object detection impresses by offering incredibly high measurement density: the compact and easy-to-integrate housing contains high-precision LiDAR laser measurement technology, which analyzes a total of four scan planes and can detect and measure the length, width, and height of objects. A number of innovative design features in the sensor ensure very high detection reliability and availability, even in demanding applications.**

The compact and space-saving R2300, with a height of just 58 millimeters, is a 3-D LiDAR (Light Detection And Ranging) sensor for optical angle and distance measurement in



stationary and mobile applications. The device uses four slightly offset scan planes, generated by a rotating mirror inside the sensor housing, to perform noncontact 3-D scanning of its surroundings.

### **Large Measuring Range, Adjustable Monitoring Field, and Unmatched Angular Resolution**

The R2300 has a measuring range opening angle of 100°, a large measuring range of up to ten meters on bright objects and up to four meters on dark surfaces, a measuring rate of 50 kHz, and selectable scan rates of 12.5 Hz and 25 Hz with up to 4000 pixels per scan. These features enable the multi-layer scanner to cover the most important requirements of a wide range of applications. In addition, the monitoring field can be customized either by selectively hiding areas outside of the detection field or by installing a second R2300 alongside the first device, thus increasing the field of view to 180°. A distinguishing feature of 3-D sensors is the small—and therefore high—angular resolution of only 0.1°, which no comparable LiDAR or multi-layer sensor can currently achieve. In combination with the precise infrared light spot typical of lasers, the R2300 is able to reliably detect intricate object structures and contours.

### **Designed for High Ruggedness and Availability**

The possible applications of the R2300—including fields such as intralogistics, mobile equipment, and robotics—meant that the multi-layer scanner required an especially rugged design. For this reason, the sensor housing is constructed from durable plastic material and the electronics in the sensor head are fixed components, providing effective protection against vibrations. The Pulse Ranging Technology (PRT) in the R2300 ensures not only a high degree of independence from object and surface properties, but also a high level of resistance to interference from extraneous light, HF lamps, and optical reflections from the application environment. Another unique selling point of the R2300 in the multi-layer scanner market is the mechanical separation of the emitter and receiver within the optical unit. The separating element in the sensor head reliably prevents optical short circuits that can occur if the front panel is dirty and part of the emitted light is directly reflected back onto the receiver element. This ensures that the R2300 always provides correct measurement results and a high level of detection reliability in practice, while at the same time significantly reducing maintenance costs. For the user, this means less downtime, significantly longer cleaning intervals, and improved availability and process reliability.

### **Pilot Laser Simplifies Commissioning**

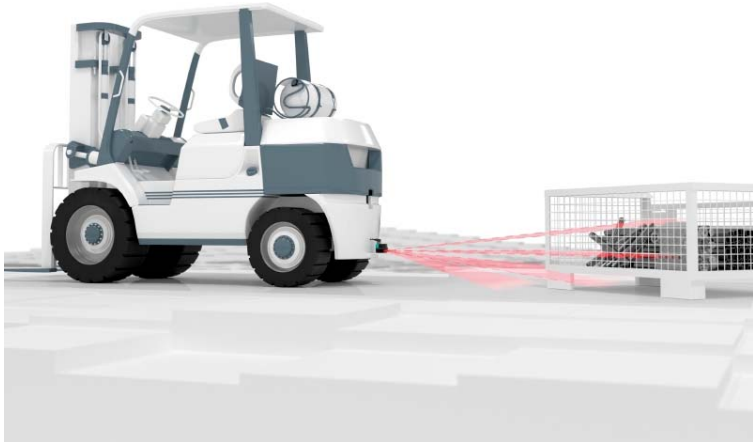
The integrated pilot laser of the R2300 simplifies the process of aligning the sensor with surfaces and specific targets during commissioning. It is switched on for alignment and is active only during commissioning. No other tools are required because the visible, red laser beam follows the same path as the actual infrared measuring laser.

**Data Output as Raw Data**

The R2300 outputs the data for angle, distance, and reflectivity with the associated timestamp. The data is transmitted via the Ethernet interface of the sensor, allowing the data to be accessed by a large number of automation systems. In the foreseeable future, the R2300 will become available in a switching version and will offer additional connection options that can be integrated in a simple and cost-effective manner via the flexible interface module.



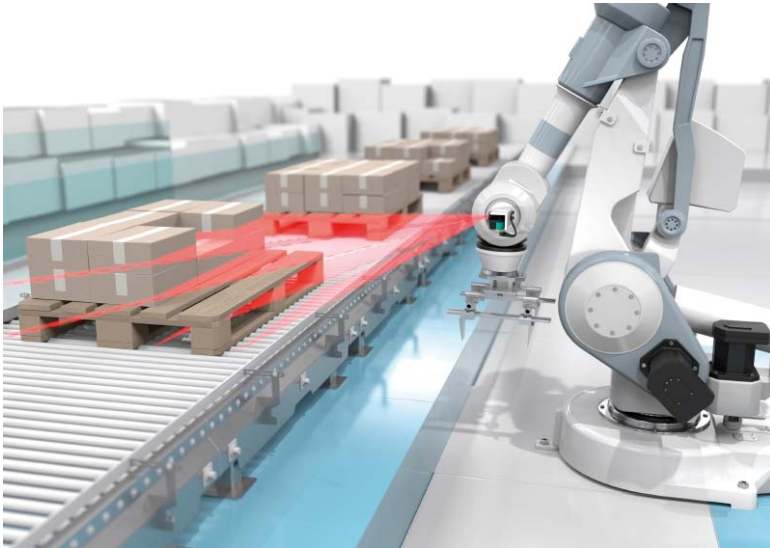
R2300 Multi-Layer Scanner



Reliable rear zone monitoring



Reliable collision avoidance and navigation support for small AGVs/bots



Carrier detection in robotic applications

Key words: R2300, LiDAR, multi-layer scanner, collision avoidance, navigation, load detection, robotics, 3-D, PRT, Pulse Ranging Technology, raw data, angle measurement, distance measurement, AGV, AMR

Author: Thorsten Schroeder

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**At a glance:**

- IO-Link master with OPC UA
- End-to-end communication from the field level to the cloud

## IO-Link master with OPC UA

### Seamless Communication from the Field Level to the Cloud

**Pepperl+Fuchs has become the first company to offer IO-Link masters with an OPC UA interface and is therefore paving the way for end-to-end, transparent, and seamless communication from the lowest field level to the cloud**

The automation specialist Pepperl+Fuchs has acquired the business of Comtrol Corporation. Comtrol is a pioneer in the field of Ethernet-based industrial communication and a leading provider of IO-Link masters. Pepperl+Fuchs has therefore strengthened its position as a system provider in the IO-Link sector and has become the first company to be able to offer IO-Link masters with an OPC UA interface.

OPC UA is an Ethernet-based communication protocol and provides an easy and flexible method of communication between machines or between a machine and the cloud. OPC UA is characterized by its independence, which gives customers incredible flexibility when designing their IoT systems, and ensures that they have complete freedom, no matter which platform they choose to use.

By combining OPC UA and IO-Link, Pepperl+Fuchs has opened up completely new possibilities for end-to-end, transparent, and seamless communication from the lowest field level to the cloud. If IO-Link functions as the interface for the identification, diagnostics, and parameter data from the sensor technology, OPC UA provides the perfect solution for transmitting this data to PC- or cloud-based systems in full and in parallel with time-critical control communication. This is the only way to realize broader visions surrounding Industry

4.0 as detailed data can be collected from the lowest field level and evaluated in a target-oriented manner.



Figure 1: IO-Link master with OPC UA interface

Author: Lukas Pogoda

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## When Customers Become Partners

### Solutions as individual as you

**For a company to ensure its long-term survival in the market, it must understand its customers, their needs, and their wishes. The company must tailor its products and services to the specific requirements and preferences of each customer. Since no one knows what these are better than the customers themselves, why not involve customers directly in the development of their customized solutions? Pepperl+Fuchs has taken this exact approach in partnership with the company montratec.**

Digitalization is changing our everyday lives, both at home and in industrial environments. With this in mind, customizable products and systems are more important than ever for many companies. This trend of offering customer-specific solutions rather than a limited catalog of products is also noticeable at Pepperl+Fuchs. "As market conditions change, so do our customers' requirements," explains Andreas Dereux, Key Account Manager at Pepperl+Fuchs. "Plant operators are less concerned with standard products and are instead asking for solutions that are tailored precisely to their needs. In collaboration with montratec, we have developed one such sensor solution from scratch."

### The Key Feature

Based in Niedereschach, Germany, montratec manufactures modular monorail systems for internal transport operations and assembly processes. The development of their new montrac® Shuttle MSH5 was highly ambitious. "The MSH5 was not about simply enhancing the previous model, but instead about making a big technological step—if not a leap—forward," emphasizes Michael Haug, Product Manager at montratec. The sensor technology integrated in the previous shuttle generation was based on a one-dimensional, photoelectric sensor with energetic signal evaluation. This sensor emitted a simple switching signal and detected shuttles ahead using a single beam of light. This meant that the sensor could not

distinguish between fixed route components, such as tunnels, shuttles ahead, and even bends in the track. This will no longer be a problem with the new generation.

"There was a long list of requirements for the new sensor as the key feature of the shuttle, and I soon realized that we could not meet them with the products available on the market. We needed to find a partner with whom we could design a solution tailored to our application," says Rolf Wiechert, Vice President of Engineering at montratec. "It wasn't easy," says Haug. "Only Pepperl+Fuchs met all of the requirements for this collaboration with its experience, technological expertise, and its readiness to use the products in its portfolio to create something completely new."

### **A Milestone in Intensive Collaboration**

Mutual trust, understanding, and a clearly defined goal are key to successful collaboration—both at home and in the workplace. "We are both specialists in our fields: montratec understands the ins and outs of industrial intralogistics, and Pepperl+Fuchs knows the benefits that high-performance sensor technology can bring to this field," says Dereux. "We have combined these two perspectives." Before the actual development work began, various meetings were held at both montratec and Pepperl+Fuchs to establish a clear understanding of the application, the ambient conditions, and the shuttle and desired functionalities. Thorsten Schroeder, Product Manager at the Pepperl+Fuchs facility in Berlin, the competence center for photoelectric sensors, oversaw the project. "The collaboration with montratec was very intensive throughout the various project phases," says Schroeder, adding: "As a Product Manager, I was particularly involved in the first phase—the development of a comprehensive specification." The specification is the basic framework for all subsequent stages, which makes it a crucial phase in the overall project. The actual development work can only begin once all requirements are specified in enough detail.

### **Based on Pulse Ranging Technology**

"The crucial starting point for this development was the decision to use measurement technology, because in contrast to the sensor installed in the original shuttle, the new technology outputs distance values that can be used for further processing," explains Wiechert. Pepperl+Fuchs uses innovative Pulse Ranging Technology, or PRT, to carry out a specially developed time-of-flight measurement that measures distances from a few inches to hundreds of yards with millimeter precision using a direct measuring method. PRT has already proven itself in many products in the Pepperl+Fuchs portfolio, as has the R2100 2-D LiDAR sensor, which was used as the basis for the new sensor solution for montratec. "The biggest technical challenge was to tailor this core technology to the conditions in the shuttle,"



explains Schroeder, who goes on to specify: "The construction, hardware, and software all needed to be adapted."

### **Tailor-Made in Many Ways**

If you compare the sensor solution developed for montratec with the R2100 portfolio sensor, which was used as a starting point for the montratec solution, it is immediately clear that the two products now look very different. A completely new end product is now being produced on a production line set up especially for this project and processed using special calibration and testing devices.

The housing has been tailored to the shape of the shuttle so that it fits seamlessly into the shuttle design. This required a complete redesign of the measurement electronics. Individual sensors in a semi-circular arrangement now provide distance and intensity information from five different measuring points. "Dealing with a multi-channel sensor solution affected how measurements were evaluated, meaning that the software also needed adjusting," says Schroeder, outlining the additional customization processes required: "For the first time, we have completely modified a two-dimensional solution to resolve a customer's problem." His colleague Dereux, visibly proud, adds: "And that's what makes this solution special! Working together with the customer, in this case montratec, to use existing, high-performance technology to create something completely new—a technically perfect and efficient solution for both sides."

When the first prototype was ready to be implemented in the shuttle, both companies were equally delighted. "After so many months of close and intensive collaboration, seeing the successful use of the sensor in the application for the first time was certainly an emotional moment," a sentiment shared by everyone.

### **Real Added Value for Intralogistics**

The advantages of the new five-channel sensor technology cannot be overstated. With five measurement beams, the new Shuttle MSH5 has an additional, peripheral field of view, which enables it to reliably detect shuttles ahead and obstructions at any time—on both straight and curved tracks. In addition to better route monitoring and optimized collision avoidance, the wider beam angle of the five emitter LEDs makes it possible to transport wider workpiece carriers. If an additional sensor is used at the rear of the shuttle, reverse travel with sensor monitoring is also an option. "We now use a high-quality industrial sensor that is far superior to a switching solution due to its measurement technology," says Haug, satisfied. "With the new features, we create *real* added value for our customers in intralogistics."

Pictures:



2-D-LiDAR-Sensors: Standard-Sensor R2100 and customized sensor for montratec



Shuttle-Transportsystem mit specific 2-D-LiDAR-Sensor.“

Author: Pepperl+Fuchs

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