

# Cloud-Based Sensor Service

White paper

Sensorik

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 **PEPPERL+FUCHS**

# Abstract

## Cloud-Based Sensor Service from Pepperl+Fuchs GmbH and connectavo GmbH

Effective supply management is an extremely important topic, particularly with smaller machines that form part of independent units. These systems pose an increased risk of running empty and, in most cases, refilling is not efficiently planned. By intelligently evaluating sensor information, long-term gains in efficiency can be achieved through advance planning and supply chain management.

In collaboration with connectavo, Pepperl+Fuchs is offering a solution in the field of intelligent supply management designed to boost efficiency. Numerous benefits can be achieved by connecting Pepperl+Fuchs sensors with the connectavo cloud in real time.

## Contact

**Pepperl+Fuchs GmbH**  
Lilienthalstrasse 200  
68307 Mannheim  
+49-621-7760  
info@de.pepperl-fuchs.com

**connectavo GmbH**  
Grafinger Strasse 6  
81671 Munich  
info@connectavo.com

# Classification

## Sensorik4.0® Solutions for Industrie 4.0 Applications

Industrie 4.0 is the pioneering concept of totally interconnected production systems that support the exchange of small or large amounts of data within a process – via the cloud – and can also communicate with higher-level information systems outside conventional corporate boundaries. In contrast to the classical strategy of hierarchically structured communication (horizontally, vertically), this modern interconnected methodology offers the advantage that communication can occur anytime, between any participant, on any hierarchical layer. Sensors having the ability to communicate is a significant characteristic of Sensorik4.0®. This term embodies Pepperl+Fuchs' innovative sensor solutions for applications within the Industrie 4.0 framework.

## The Solutions Park Brings Industrial Sensors to the Internet of Things

The Solutions Park demonstrates real-world sensor solutions that highlight the customer benefits of Industrie 4.0. The customer benefits of Industrie 4.0 stem from the availability of process and diagnostic data from sensors and actuators within a company's internal or external IT systems. For instance, using this data, these IT systems can perform visualization, realize model-based optimization processes, and schedule demand-based preventive maintenance processes. For such applications, Pepperl+Fuchs and our IT partners offer solutions that allow sensing technologies to be directly connected to a company's IT infrastructure.

Pepperl+Fuchs offers a wide range of products designed to collect data from spatially dispersed sensors. Then, we make that data available to application-relevant databases on the Internet. This data is accessible on these Internet portals through mobile devices or can be used by downstream processes. In the context of Industrie 4.0, the idea of continuous engineering throughout the entire product life cycle plays a crucial role: All of the data must first be collected in a digital format, then made available for electronic processing. To this end, Pepperl+Fuchs has developed a system that directly compares quality data obtained during the manufacturing process to the design data – deviations are automatically identified.

## The Industrial Sensor in the Internet of Things

The Internet of Things extends the range of potential applications for industrial sensors beyond the boundaries of conventional mechanical engineering. Spatially separated measuring points distributed over a wide area can be networked and the information they provide evaluated centrally and utilized further. The cloud-based sensor service has already been implemented as an application.

# Description

## Supply Management as a Value Driver

Effective supply management (e.g. level measurement) is an extremely important topic, particularly with smaller machines that form part of independent units. As refilling is generally not efficiently planned, these systems pose an increased risk of running empty. By intelligently evaluating sensor information, long-term gains in efficiency can be achieved through advance planning and supply chain management.

## Benefits for You

Fill levels are recorded on an ongoing basis using corresponding sensors. In order to use this real-time data effectively, it needs to be aggregated from the local plant at a central location and processed further. With this in mind, in collaboration with connectavo, Pepperl+Fuchs is offering a solution in the field of intelligent supply management designed to boost efficiency. Numerous benefits can be achieved by connecting Pepperl+Fuchs sensors with the connectavo cloud in real time.

- Permanent access: Real-time data can be accessed even on mobile devices thanks to Web-based access.
- Flexibility: Limit values can be adjusted directly, regardless of location.
- Service on demand: If the fill level approaches a critical value, the person responsible for maintenance is informed via text message or e-mail.

## Supply Management in Practice

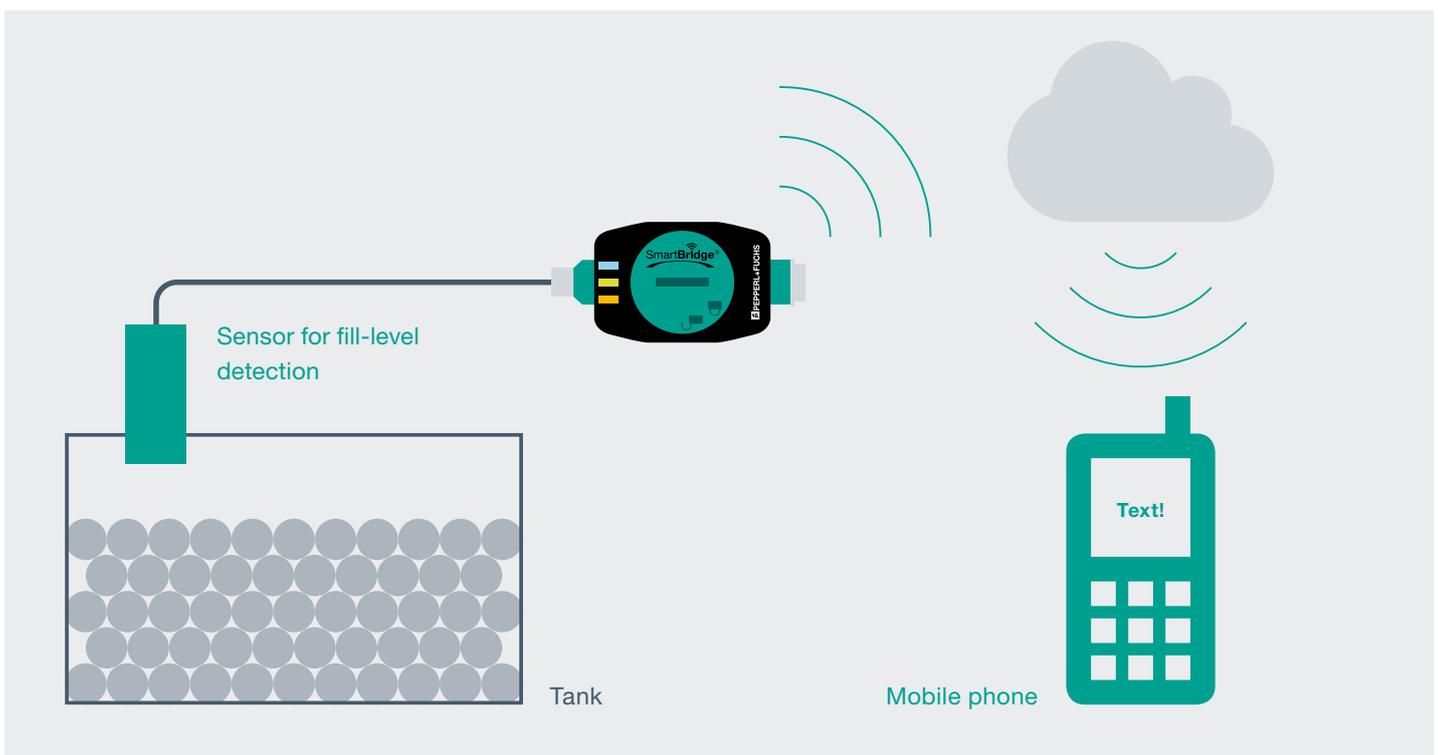
The solution to network sensors with the connectavo cloud is already being implemented in production systems. Where previously it was necessary to evaluate sensor data at regular intervals on-site, after implementing the system, a centralized and automated form of querying is possible.

Even interim storage solutions used previously are becoming obsolete. Additional interim storage solutions were previously often necessary to avoid shortages during the process; however, these solutions also took up valuable space in production areas. As the push logic of the newly implemented solution eliminates the risk of unscheduled material shortages, interim storage solutions can be done away with and the entire supply management process made easier and more efficient.

## Outlook

However, the application described here is merely the first step. Productivity can be optimized further still by connecting to existing systems or using analysis algorithms.

1. It is possible to link the transferred data in the cloud to external systems. In this way, product-specific data and the production schedule can be integrated into the fill level data via the ERP system. Linking this data makes it possible for the system to independently calculate the ideal time for placing an order and automatically trigger an order.
2. Additional conclusions relating to the machine can be drawn by analyzing historical supply data. If consumption in a specific production cycle is higher than it was in the past, this could be indicative of a change in machine behavior. It is also possible to calculate an optimized cycle and time for machine maintenance using algorithms and context data.



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## Explosion Protection

- Intrinsically Safe Barriers
- Signal Conditioners
- Fieldbus Infrastructure
- Remote I/O Systems
- HART Interface Solutions
- Wireless Solutions
- Level Measurement
- Purge and Pressurization Systems
- Industrial Monitors and HMI Solutions
- Electrical Explosion Protection Equipment
- Solutions for Explosion Protection

## Industrial Sensors

- Proximity Sensors
- Photoelectric Sensors
- Industrial Vision
- Ultrasonic Sensors
- Rotary Encoders
- Positioning Systems
- Inclination and Acceleration Sensors
- AS-Interface
- Identification Systems
- Logic Control Units
- Connectivity