

# PCN

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processing & control news

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Kay Petermann  
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Dear Reader,

I am back from an interesting week visiting Hannover Messe and meeting a lot of people. The biggest event I visited since the beginning of the COVID 19 pandemic.

In the beginning it was a bit strange, but a very interesting event with a lot of new products and solutions. At the Festo stand one of the highlights was a demonstrator for biomass cultivation through artificial photosynthesis with algae. Goal of the project is to bind carbon dioxide more efficiently than it is possible with land plants and generate raw materials for packaging, cosmetics or pharmaceuticals.

Heart of the bioreactor is a quantum-based particle sensor, developed by Q.ANT, a Trumpf subsidiary. The sensor measures the biomass accurately to control the process for optimum yield. That is an example that is a step beyond what we would classically call digitalization. But in this issue we want to present you some interesting examples for the digitalization in process industries that follow some more conventional ways – but only compared to a quantum-sensor.

The editorial on page 14 introduces a way how Apps can be used in an innovative way for process instrumentation and the article on page 16 shows how an AI-based predictive detection tool can be used without being a specialist. You can also find out what opportunities a cloud-based fluid management offers for production and services.

End of August another big event will take place in Frankfurt, the ACHEMA. We will be there, on the lookout for new products and solutions. If you are there as well, and want to meet us, please don't hesitate to send me a mail to set an appointment.

As always, I wish you an interesting read.

Editor of PCN Europe



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**Innovative Solutions, Intellectual Property and Investment with DCS Technology.**  
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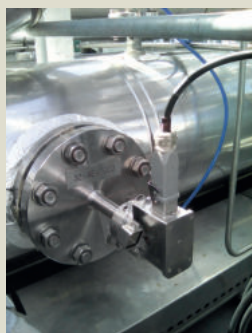
## BTC Europe and NXTLEVVEL Biochem sign distribution agreement on levulinate



BTC Europe GmbH and NXTLEVVEL Biochem have recently signed an agreement on the distribution of biobased and biodegradable solvents derived from levulinic acid for the European market. Levulinic acid can serve as a versatile building block for chemicals and materials derived directly from biomass. Due to their broad solvency power, low volatility, high safety profile and biodegradability levulinate solvents offer a sustainable alternative to solvents based on fossil feedstock for a wide range of applications. Both companies seek to leverage their expertise and industrial know-how to respond to the high demand for more sustainable and low-emission products on the European market and enable customers to make more environmentally friendly decisions in their procurement and development processes. Through the cooperation, customers will have access to resource-efficient solutions derived from non-food crop biomass with which they can reduce their carbon footprint and secure long-term sustainable competitive advantages.

## GERG Industry Study on LNG Measurement

The aim of the GERG evaluation project was to validate the measurement capabilities of Raman technology to deliver reliable, accurate and precise composition measurements for energy calculation in LNG custody transfer applications. During the multi-year study, thorough testing was performed at a baseload LNG transfer facility at Fluxys LNG in Zeebrugge, Belgium. To ensure the data met LNG metrology standards, reference LNG samples were provided by EffecTech, a leading provider of inspection, calibration, and testing. Measurements of LNG were taken directly in the liquid phase by an Endress+Hauser Raman system comprised of a Raman Rxn-41 cryogenic probe fiber-optically coupled to a Raman analyzer optimized for LNG. The published GERG report, "Raman method for determination and measurement of LNG composition," concluded that Endress+Hauser Raman analyzer systems offer equivalent LNG measurement uncertainty with significantly lower operating expense and technical expertise than traditional GC/vaporizer systems. Not only did the Raman system reduce the complexity of the LNG monitoring system and have faster start-up stabilization times, but it also proved to have better repeatability, responded more quickly to process changes and required no maintenance during the entire evaluation period (experiencing >99% uptime).



lent LNG measurement uncertainty with significantly lower operating expense and technical expertise than traditional GC/vaporizer systems. Not only did the Raman system reduce the complexity of the LNG monitoring system and have faster start-up stabilization times, but it also proved to have better repeatability, responded more quickly to process changes and required no maintenance during the entire evaluation period (experiencing >99% uptime).

## Automation Technology Facilitates Large-Scale Biomass Cultivation Using Artificial Photosynthesis

Festo and Q.ANT, a wholly owned subsidiary of TRUMPF, are entering into a strategic partnership to cultivate biomass on an industrial scale. The two companies aim to achieve this using a combination of automation technology from Festo and quantum technology from Q.ANT. Algae offers significant potential in this context. Algae have an extremely high photosynthetic efficiency in their natural environment, binding ten times more carbon dioxide (CO<sub>2</sub>) than land plants. When algae are grown in bioreactors equipped with appropriate sensors, control technology and automation, this efficiency can be increased even further, reaching a hundredfold that of land plants. The substances created in this process can be used as raw materials for pharmaceuticals, packaging and cosmetics and, ultimately, recycled in ways that create a climate-neutral system. This gives algae considerable potential to drive the circular economy. One of the biggest challenges lies in accurately determining the amount of biomass. To do this, Festo relies on quantum sensor technology from Q.ANT. "Our quantum-based particle sensors open the door to new processes, applications and industrial products. Using this technology for industrial photosynthesis is a great way to demonstrate how much potential it offers for the future," says Dr. Michael Förtsch, CEO of Q.ANT.



## Customer Experience at the Heart of new Headquarters

Fluke has announced the launch of its new European Headquarters in Eindhoven, Netherlands, which includes a 400sqm customer experience centre. For the first time, customers will not only be able to see Fluke's range of tools, but experience using them in a variety of real-world applications. Eric van Riet, Strategic support and training manager at Fluke describes it as a dream come true: "What we wanted was for customers to experience our tools in an environment as close to reality as possible to show where and how our products are used, and provide the opportunity to deliver training," he said. The individual environments in which each of Fluke's tools are used have been reimagined in the heart of the building. From miniaturised electrical substations to small scale factories, a scene has been set for each. The aim of the centre is to create user experiences, a first impression for customers through a showcase of Fluke products, to offer an environment to use and demonstrate the products and to offer a first-class training facility.



## WIRELESS AUTOMATION SYSTEM ADDITION

Entry-level model for simpler automation applications



**JUMO** variTRON 300 is based on a powerful CPU with an 800 MHz single-core processor. The software has a modular structure based on a Linux platform and uses the CODESYS V3.5 programming environment SP16. Another special feature is a customer-specific configuration and process data editor. In addition, individual applications

can be created using the modern programming environment. The central processing unit has 1 USB host, 2 Ethernet interfaces, and 1 RS485 connection as connection options. Up to 32 wireless JUMO Wtrans sensors can be connected via a wireless gateway for various purposes including measuring temperature or pressure. A large selection of connection modules with high-quality, configurable analog inputs and reliable, independent PID controllers with an autotuning function can be connected using a specially developed 1-port router. Displays in various formats are available for visualization. JUMO provides visualization libraries for individual customer-specific operation via CODESYS Remote TargetVisu or CODESYS WebVisu. A high degree of flexibility is also guaranteed by the integration of all important fieldbus systems via CODESYS (such as Modbus RTU or TCP master and slave, PROFINET IO controller, EtherCAT master, and OPC UA server).

▶▶ 61575 at [www.pcne.eu](http://www.pcne.eu)

## SELF-CALIBRATING MOISTURE ANALYZER

Trace moisture analyzer for biomethane injection



Increasingly, biomethane is being injected into national gas transmission networks along with natural gas. The quality of the biomethane, especially moisture content, is monitored to ensure that there is no risk to

equipment or loss of calorific value down the line. Monitoring the moisture content of the biomethane is essential to ensure that no liquid water condenses in the pipeline to avoid the risk of corrosion or ice formation. Drying the gas to a low dew-point greatly reduces formation of corrosive compounds and increases the overall efficiency of the plant. A fast-responding moisture analyzer is needed for monitoring the moisture content of the biomethane prior to the point of compression. Quartz Crystal Microbalance technology is a good choice for this application because it is fast and responsive to changes in moisture content. Ideal for monitoring the stream of biomethane at the compressor station. QCM analyzers are also a low-maintenance option, giving operators a low lifetime cost of ownership. The **Michell** QMA401 process moisture analyzer includes a self-calibration to ensure long-term reliability. The analyzer includes an internal moisture generator, which has a traceable calibration to NIST/NPL. The QMA401 uses this moisture generator as a reference against its own sensor and is able to readjust its measurements to guarantee long-term measurement stability.

▶▶ 62128 at [www.pcne.eu](http://www.pcne.eu)

## MEDIA-RESISTANT PRESSURE SWITCH

With rotatable touch display and IO-Link



Switching pressure at the touch of a finger, only? The brand new P.Touch pressure switch makes this possible, intuitively operated via integrated touchscreen.

**AMSYS** offers with the new P.Touch a media-resistant pressure switch for hydraulic fluids

or water in the range of 10 bar to 600 bar. The rotatable display and the (programmable) color coding allow a quick visual control on site, the IO-Link a control from a distance. Two switching outputs with 200 mA switching current allow direct connection of most common relays and many valves. An analog output is available as an alternative. The IO-Link output makes it easy to integrate the sensors into a manufacturer-independent Industry 4.0-compliant sensor network, even at a later stage - should the need arise. The full functionality of the sensor is available centrally in the network making it easy to implement a central warning system (predictive maintenance) The system can be operated and programmed remotely and can be monitored even without direct access to the machinery. Thanks to various sealing materials and the pressure connection made of 1.4404 stainless steel, even aggressive media with temperatures in the range of -25..100°C do not pose a problem. It is connected to the piping via a G1/4" internal or external thread, the electrical connection is made via an M12 plug.

▶▶ 62462 at [www.pcne.eu](http://www.pcne.eu)

## SEPARATOR FOR BEVERAGES AND OILS

Variety of sizes for different size of applications



Separators are used to separate the finest solid particles from liquids. To be able to offer customers more options and the optimum solution, the separator portfolio is expanded with a new machine size: the **Flottweg** AC1700 separator. The AC1700 separator fits between the

popular AC1500 and AC2000 series and completes the product portfolio for the food and beverage industry. With over 70,000 m<sup>2</sup> / 753,474 ft<sup>2</sup> of clarification area and an acceleration of 11,000 g, the compact separator ensures an optimally clarified final product with a high throughput. In addition to the large clarifying area, the AC1700 - as well as all other separators in the Flottweg AC series - is engineered and made in Germany and is characterized by two essential features: the separator is very robust with low-maintenance requirements and remains calm even under extremely high g acceleration. The hygienic requirements that the machines must meet are particularly important for the food and beverage industry. The separators, including the AC1700, meet high hygienic standards. If desired, the separator can be easily integrated into existing CIP (Cleaning in Place) processes. The hygienic design ensures that even the smallest product residues can be easily removed during cleaning.

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## DIGITAL HUMIDITY & TEMPERATURE PROBE

For harsh environmental conditions up to 120 °C



The **E+E Elektronik** HTP501 probe features a rugged IP66 stainless steel enclosure, a high-temperature cable with moulded M12 connector, and a choice of different filter caps.

The electronics are well protected inside the probe and therefore safe from condensation and corrosion. A proprietary coating protects the humidity sensing element and its leads against dust and corrosive deposits, ensuring excellent measuring performance and long-term stability in harsh conditions. An optional sensor leads protection helps to significantly extend the service life of the sensing element in particularly aggressive environments. The HTP501 measures the relative humidity and temperature in an operating range of -40 to 120 °C. The high-quality humidity sensing element, temperature compensation and configurable pressure compensation ensure excellent measurement accuracy. In addition to the measured humidity and temperature values, the sensing probe calculates further humidity-related physical quantities such as the dew point temperature, absolute humidity or mixing ratio. The measured data are available on the RS485 interface and can be easily integrated into process control using the Modbus RTU protocol. Two probe lengths (200, 400 mm) and three different cable lengths offer the user a huge flexibility for installation.

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## STREAMLINED INDUSTRIAL TRANSMITTER

Precise measurement and visualization for one parameter



**Vaisala** has launched its Indigo510 transmitter, which is compatible with all Indigo smart probes. The features include modular support for one probe at a time, and a large touchscreen display for local data visualization.

The Indigo510 builds on the modular platform and includes the same metal casing, software, and display as the flagship Indigo520 Transmitter. Indigo510 is available also without a display. The Indigo510 is an ideal choice for demanding industrial applications where precise and accurate measurements are needed for a single parameter at a time. Its rugged IP66 and NEMA4-rated metal enclosure ensures reliable performance in the toughest environments. The streamlined transmitter has been designed to meet demands for a simpler solution with single-probe support and without compromising the benefits of modularity by customers who needed not the full functionalities of the flagship transmitter. Measurement of humidity, dew point, moisture in oil, temperature, carbon dioxide, and vaporized hydrogen peroxide are possible with the assurance of reliability, accuracy, and the strong chain of data provided by the Indigo ecosystem. The transmitter extends the options for data visualization, connectivity, supply voltage, and wiring compared to using a stand-alone probe. In addition, customers benefit from regular platform and software updates.

▶▶ 62455 at [www.pcne.eu](http://www.pcne.eu)



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## FLEXIBLE CLAMP-ON FLOWMETER

For the versatile measurement of numerous fluids



Ultrasonic flow measurement with clamp-on sensors has been used successfully in many industries. But even in basic and standard applications, requirements are growing steadily due to process automation. Prosonic Flow W 400 therefore combines proven ultrasonic measurement with the advantages of **Endress+Hauser's** Proline device series, thus meeting the requirements of plant operators: cost efficiency, comprehensive process

monitoring and maximum freedom when planning measuring points. The clamp-on design enables safe measurement of even corrosive, abrasive and toxic fluids - regardless of conductivity or pressure. Prosonic Flow W 400 can be ordered optionally with the unique FlowDC function that detects and compensates for effects of flow disturbance, e.g. downstream of pipe bends. This makes it possible to maintain a consistent accuracy even with a significant reduction in inlet runs. A maintenance-free contact foil (coupling pad) provides optimum sound transmission between sensor and pipe. The resulting constant, high signal strength ensures stable measurement results over many years. Depending on the line size, fluid and pipe material, the sensors are delivered with different ultrasonic frequencies (0.3 - 0.5 - 1 - 2 - 5 MHz).

▶▶ 62306 at [www.pcne.eu](http://www.pcne.eu)

## ANGLE SEAT VALVES WITH IMPROVED SAFETY

For optimization of processes for many applications



**Emerson** expanded its range of angle seat valves with the new ASCO™ Series 290D, available now in Europe and globally by late 2022. After 25 years of proven use in the field, Emerson identified key opportunities to

optimize this series for new and existing markets. The robust, modular design of the expanded 290 Series comes with a new array of valve bodies and actuator materials, fittings, functions, certifications and accessories. Significant features include fugitive emissions certification, switch box with IP69K protection level and safe actuator dismantling. These customizations improve process efficiency and safety while reducing costs in many applications, including industrial, food and beverage and specialty chemical. In the new 290D Series a wide range of valve bodies, actuators, options, control box and certifications are provided for enhanced application versatility. Built-in modularity makes it possible to interchange different actuators on the same body for on-site modification of the valve characteristics after assembly. Both IP66 and IP69K enclosures are available for either indoor or outdoor use. The new Series 290D is also suitable for a wide range of media, including aggressive fluids, steam, gas, vacuum and superheated water. The Series is designed with a highly reliable fluid control mechanism engineered for exceptionally safe shutdown.

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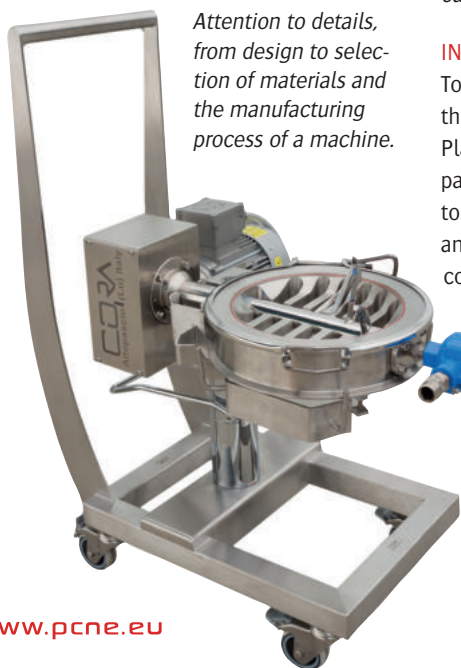
# Services Around Your Bulk and Solids Project

**A holistic approach on customer support for the Chemical and Pharmaceutical Industries**

Talking about assistance today more than ever, it has become for CO.RA. the main objective to assist all customers where they need it.

More and more CO.RA. offers a 360° service guarantee: to be ready at all times to intervene, remotely or on site, with specialist technicians that assist the customer to choose the right solution, with tests in the company's technology center and during installation or with the start-up with CO.RA. qualified servicemen. Also staff training performed by CO.RA. servicemen is on the list of possible services. The usual lead time for technical assistance is within 48 hours from report of the problem. Sharing proposals, solutions and technologies with customers to transform projects into reality, is important opportunities for growth, which made the company one of the leaders in the field since its founding in the 80ies.

*Attention to details, from design to selection of materials and the manufacturing process of a machine.*



*Is everything going as expected? Extensive testing is important to achieve the best for the customer.*

## **INTEGRATED SYSTEMS AND TURNKEY PLANTS**

Today CO.RA. can boast of a vast experience in the supply of Integrated Systems and Turnkey Plants for pharmaceutical and chemical companies. The staff is able to guarantee all customers 360° services, providing established and/or experimental technologies, technical competence, reliability and collaboration: necessary ingredients that go beyond the supply of a simple plant.

Despite the current situation, that is our context, CO.RA., through suitable technological tools, is also present for its customers abroad, through remote assistance solutions and remote qualification tests, with SMART solutions within reach of each device.

The attention to detail, which the staff puts in the foreground, has given rise to the creation of a plant designed, built and qualified in accordance with cGMP principles. Only with an HMI panel it is now possible to define a recipe, monitor the main operating parameters and control four coordinated dosing lines to create a single bulk.

In particular, the control system was programmed and customized according to the specific needs of the customer and in consideration of the aspects of data integrity.

The plant consists of 4 stations, each of them complete with STERI LIFT, HR CRUSHER, BAG EMPTYING, DOSING SYSTEM and BIN.

Each station allows the loading and dosing of an ingredient which, mixed with the others in







**CO.RA**

**Need for a Digital Technician?!**

At CO.RA. we are committed to providing service solutions for process and equipment.

Always at your side, we solve problems directly on site or via remote assistance.

Would you like to share information or ask any technical questions?

We can help you make adjustments and show you where exactly to act.

Remote assistance with a specialized technician is a real service worth trying.

Smart remote processes are an important addition to the portfolio.

subsequent processes, will formulate the finished product. The BIN will be automatically moved by the system to receive the quantity of product foreseen in the recipe set by the general control panel. Once the fourth station is reached, the BIN is automatically returned to the starting point, ready to be transported to the next processing step. The qualification activities were performed remotely with the help of high-quality equipment and professional and specialized staff.

#### A STAFF OF SPECIALISTS

CO.RA is able to offer complete service packages to their customers, from choosing the best solution, to installation and after-sales assistance.

Some of the main activities are:

- Analysis and verification of user, P&I and customer technical specifications;
- Meeting and technical inspection to define the project;
- Design and proposal of a Customized Technical Solution;
- Drafting of specifications and documents necessary for the realization of the project;
- Realization of verification and tests at the CO.RA. Technology Center with customer products;
- FAT, at CO.RA. or in SMART SERVICE;
- Installation and SAT at the customer site;
- IQ and OQ protocols, use and maintenance manuals complete with certifications;

- TECHNICAL TRAINING for personnel training, in presence or in SMART mode;
- Technical assistance in presence or in SMART mode;
- Scheduled maintenance;
- Spare parts replacement planning;
- Management of complaints and reports of anomalies.

#### GOOD CONSTRUCTION STANDARDS

All CO.RA. components and systems are completely made of certified stainless steel, designed according to the European referenced standard for lifting loads, according to the lifting regulations and according to the FDA regulations, ideal for use in sterile environments and in compliance with cGMP recommendations (Current Good Manufacturing Practice). Complete traceability of components is guaranteed thanks to laser engraving directly on the steel

#### NORMS AND RECORD TO CUSTOMER DISPOSAL

As per all CO.RA. products, all components have related certification and documentations for the following are offered upon request: Surface roughness certificate, functional specification, operation & maintenance manual, Layout, EC certificate of conformity, FAT & SAT records, IQ & OQ records and Declaration of suitability for ATEX environments.

►► 62043 at [www.pcne.eu](http://www.pcne.eu)

#### COMPANY PROFILE:

CO.RA. was founded in 1989 in Altopascio, a Town near Lucca in Italy. The company started as a supplier of components to connect machine "A" to machine "B" in the pharmaceutical and chemical industry. During the more than 30 years of activity the company and staff of experts gained experience and specialized know-how to offer customers a complete service in the SOLID HANDLING process.

The staff is composed of researchers, production designers, engineers and customer service team.

The 30+ years of tradition in chemical and pharmaceutical SOLID HANDLING allow CO.RA.® to guarantee its products based on strict norms (FDA, ATEX). Design and development manufacturing are completely based in Altopascio.

CO.RA.® has left a trail of success that customers follow with trust - many of which we have been serving for more than 20 years.

To get a better knowledge of the company, products and the services offered, visit the website [www.coraitaly.net](http://www.coraitaly.net).



## Innovative Solutions, Intellectual Property and Investment with DCS Technology

The DCS has been the link to production information from the plant floor for decades. We interviewed Mark Taft from ABB who gives a review on DCS technology, digital transformation, and sustainable production.

**DCS technology (Distributed Control Systems) is well established in a broad range of industries. What were and are the key drivers for the technology and have they changed?**

**Mark Taft:** DCS technology has aimed to provide safe, efficient, and reliable operation of industrial processes. However, today's automation practitioners want more from their suppliers, including innovation agility, and reduction of the lifecycle costs of their automation.

Our customers are working through several standardization initiatives. Examples include the Open Process Automation Forum (OPAF), a consortium of end-users and automation providers working to define a standards-based, open, secure, and interoperable architecture for tomorrow's process automation systems.

It aims to integrate best-in-class components and preserve asset owners' application software at a significantly lower cost.

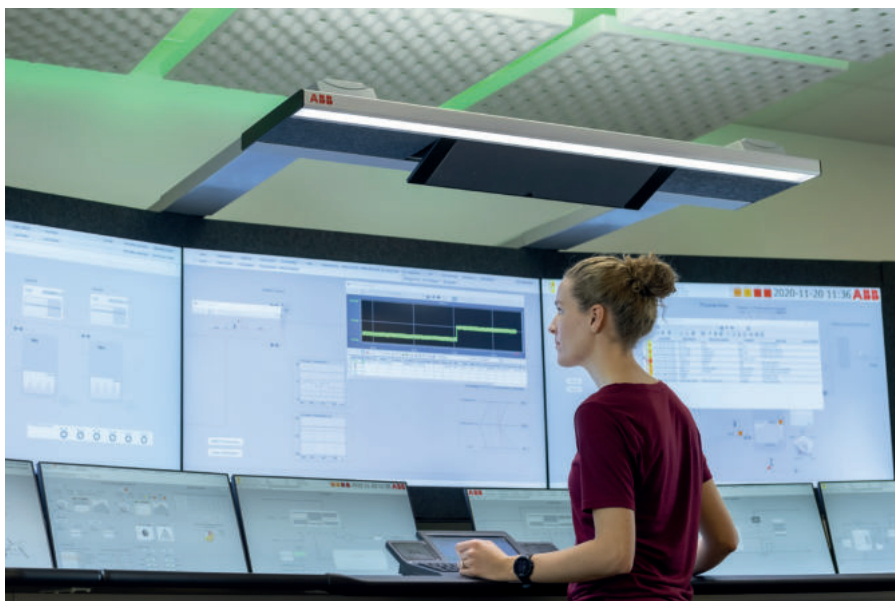
NAMUR has defined an open architecture model NOA (NAMUR Open Architecture) that segregates core control and automation functionality from non-time-critical monitoring and optimization applications described by the Industrial Internet of Things (IIoT).

**With digital transformation more and more data is created in every production line. How can this information be turned into helpful insights of processes?**

**Mark Taft:** The DCS has been the link to production information from the plant floor for decades. ABB has a long history of integrating electrical systems, telecoms, CMMS, asset management, documentation, and opti-



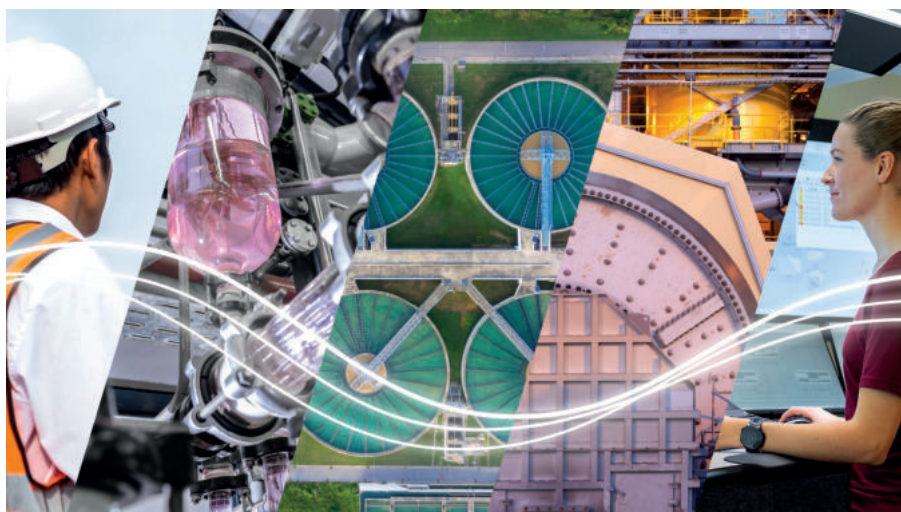
Mark Taft, Group Vice President at ABB



mization applications into our system, giving the user consistent access to plant assets for maximum efficiency and performance.

New standards such as OPC UA, and APL with PA DIM provide platform independent access to the information source, while also aiding high level interoperability between systems and applications from different suppliers. With cloud and edge technologies, we can separate non-critical extended automation applications from the core control assets. This gives more computational power, and more agile deployment of technologies such as AR, VR, machine learning and artificial intelligence at the edge, without disrupting plant process control.





**In constantly changing markets companies need more flexibility for their production processes. How can up-to-date DCS system support customers here, especially when it comes to a modular automation approach?**

**Mark Taft:** Modularity is key to more flexibility and enhancements to our current automation systems will have modular hardware and software. Independent modules will be integrated to provide the system level interaction, orchestration, and consistency that our customers have become accustomed to with our Extended Automation offering. These individual modules may be upgraded or replaced without affecting the automation solution.

Process control applications will be based on libraries of reusable application function modules, cutting effort. Using well-defined communication interfaces will avoid the need to coordinate these functional modules.

NAMUR's MTP or modular automation concept evolves this with a standardized, modular concept applied to the automation associated with process "skids" provided by equipment and process OEMs to offer full process control and operations support. A major pain point in automation has been mapping data and commissioning interfaces to third party PLCs and controllers. Standard interfaces make it easier to integrate controllers into complete processes. Combined with modular implementation, processes can be adapted quickly to make new products.

**Sustainable production and transformation into a decarbonized industry are important challenges for you and your customers. How can you support your customer's efforts and help them, e.g. when it comes to integration of more volatile sources to their energy mix?**

**Mark Taft:** Industry is trying to adopt renewable, zero-carbon energy sources. Many will need to electrify processes to use wind and solar generation as well as grid-supplied electricity from renewable sources. There will also be the need to switch sources to take advantage of optimum costs.

Renewables are intermittent and also need energy storage. Optimizing process operations under these constraints requires vendors who can integrate process automation and electrification.

ABB has this expertise and is identifying which process and material buffers can partially offset renewable intermittencies. Optimization strategies need to consider that a particular process heater can be turned off for 20 minutes without upsetting production, while a nearby piece of rotating equipment cannot withstand a power sag of even five milliseconds without tripping.

**Demographic shift is affecting the industry and will do even stronger in the future. What concepts are needed in the future for a safe, and effective production?**

**Mark Taft:** One issue is knowledge lost from retiring operators. Tomorrow's operators will not only monitor levels and pressures but maintain optimal operations throughout the plant's lifecycle. Artificial intelligence can help create a decision support system from existing data sources such as process, alarm, and event data; engineering documents; standards and safety procedures. A new digitally native workforce will find this more attractive.

These trends can lead to increasingly autonomous plants – particularly in dangerous or remote locations - overseen by remote operators aided by experts around the globe.

The shortage of experienced talent has led ABB to design its next generation automation systems to use pre-made, pre-tested functional software supplied complete with elements for control, visualization, and associated services. Overall process orchestration of the software modules will be facilitated by the system, with control engineers moving from programming control logic to configuring process-specific automation requirements. As well as saving time and effort, quality controls on pre-tested code will help the unit get operational quickly. It will also allow the agile control strategy upgrades and reconfiguration of processes to fulfil demand for new product variants.

Automated engineering methods will help develop process control logic. For example, piping and instrumentation diagrams (PI&Ds) can directly generate a good first estimate of effective control logic.

**ABB is an innovation leader in automation and DCS technology over a long time now. What developments are you expecting for the next few years?**

**Mark Taft:** ABB's next-generation technology for Process Automation Systems will empower industries to compete in a fast-changing world by delivering adaptable and reliable, integrated, modular and secure automation solutions for autonomous operations and sustainable performance.

The systems will facilitate digital transformation and collaboration between people, systems and equipment through secure OT/IT integration, ensuring the safety of people and the environment.

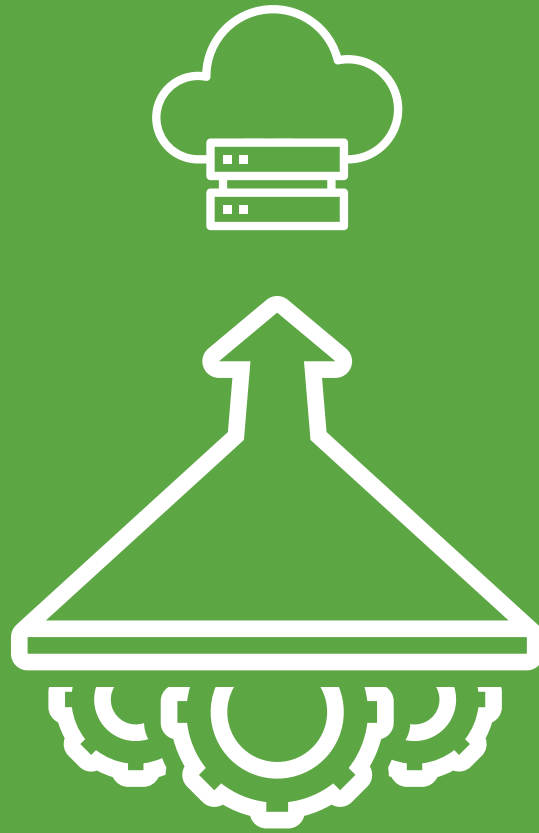
These systems will be engineered and deployed with tools providing a more modular and flexible, simpler and faster, more automated project engineering execution and commissioning process.

ABB has an installed base of over 35,000 systems. We have a history of balancing new technology introductions against production continuity, and a sustained commitment to protecting our customers' investments, by providing a path forward for their systems.

Our next generation systems will allow our customers to use the latest, innovative solutions while protecting their intellectual property and investment in applications, meaning they can retain their current ABB control infrastructure when moving from existing to new technology.

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## Open Standard for Sensor-to-Cloud Integration



Did you know that all networked devices can be FDT-enabled? It's true. There are millions of them in service around the world. FDT offers secure, seamless, standardized integration and information exchange for the intelligent enterprise.

Now, with the FDT (3.0) Unified Environment (UE), all that device data is available in a single FDT Server solution. Imagine an integrated web server mobilizing field device management and a prewired OPC UA Server for enterprise real-time device data access.

[fdtgroup.org/innovation](http://fdtgroup.org/innovation)



# FDT Unified Environment Empowers Data-Centric Business Models

**FDT 3.0 provides the standardized universal solution for open automation integration, configuration, monitoring and mobility**



Modern technologies highlighted in Industrial Internet of Things (IIoT) strategies are helping forward-thinking end users, system and device suppliers reap the benefits of smart manufacturing.

At the heart of the IIoT is the FDT Group's integration standard. The latest version of the standard, FDT Unified Environment (UE), or FDT 3.0, has evolved to a distributed, multi-user, client/server approach. It offers a robust combination of features, including a data-centric platform with built in security offering faster performance, ease of use, and investment protection.

For end users, system and device suppliers, FDT 3.0 is the data interoperability standard for the secure and reliable configuration and visualization in industrial automation devices and systems independent of communication protocol,

vendor, device/device type/representation or information model, supporting all aspects of a control system lifecycle.

The unified environment and distributed control attributes include a single user interface that benefits both the automation supplier and end user communities in the process, hybrid and discrete manufacturing markets as these major market sectors merge and streamline per market demands and for better overall efficiency, production and quality.

The key driver of FDT's smart manufacturing functionality starts with Device Type Managers™ (DTMs™) running the new FDT 3.0 standard. Globally adopted and internationally recognized by ISA 103, GB-T 29618-2017 and IEC 62453 organizations, tens of millions of DTM-enabled devices world-wide are serviced by FDT hosting environments, and all major control

by placing all certified DTMs in the FDThub™ DTM repository for automatic download and installation.

## JUMP-START MIGRATION

Today, there are millions of DTMs deployed using FDT 1.2 and FDT 2.0. Those DTM-enabled devices can integrate into new FDT UE hosting environments. To take advantage of FDT UE's new capabilities, device vendors need to update their DTMs to support the new FDT 3.0 specification to allow IT/OT data consistency and mobile access via any OPC UA or FDT client.

From a single-user desktop application for device integration, configuration, and monitoring to a multi-user distributed server application architecture, FDT UE enables modern remote operational lifecycle management.

system and device vendors support FDT technology.

The flexible FDT Server architecture and robust FDT Desktop environment bridge the FDT install base with next-generation technology. Enhancements focus on enabling mobility of the architecture, and eliminating device management headaches

The vendor community can jump-start FDT development with a modernized Integrated Development Environment (IDE), known as Common Components, to create next-generation, data-centric FDT Server, FDT Desktop and FDT DTM solutions.

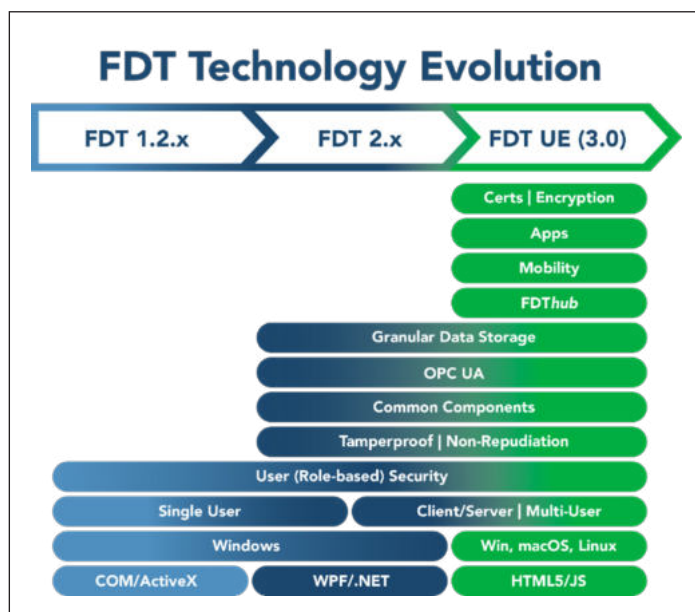
These toolkits, available for use with any of the major operating systems, ensure specification compliance, greatly enhance interoperability, and work together to help developers deliver an ecosystem of FDT IIoT-enabled solutions while expediting time to market.

Learn more about FDT 3.0 common components. FDT toolkits are available here: <https://www.fdtgroup.org/development/>

*Steve Biegacki*

*FDT Group Managing Director*

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## Adding Apps Into the Field!

What comes to mind when you hear the word "app"? WhatsApp? TikTok? Linked-in? Broadening our scope from these examples that deliver entertainment and connection, what can apps do for users in the process industries? Quite simply, an app is an application software that generates benefits for the user - on your mobile device, in the cloud or on a server 'under the desk'. Let's take a look at three apps for process instrumentation, exploring their different approaches as well as their advantages.

With the popularity of smartphones, the word "app" has become firmly established in the German-speaking world to mean specific user programs. With the help of apps, we can conduct banking transactions, communicate with each other in a variety of ways, navigate or play games – all while on the move.

But did you know that "app" is the abbreviation for application software? Every day, millions of people access the app stores for the major mobile operating systems Android and iOS, where the latest little helpers are available for download. What's more, mobile devices are not only used in the private sphere, but increasingly also in workplaces like yours. Process industries are taking advantage of the at-your-fingertips data that apps deliver safely and conveniently - and even include features like ATEX certification.

### CONVENIENT PARAMETERIZATION OF FIELD DEVICES VIA SMARTPHONE

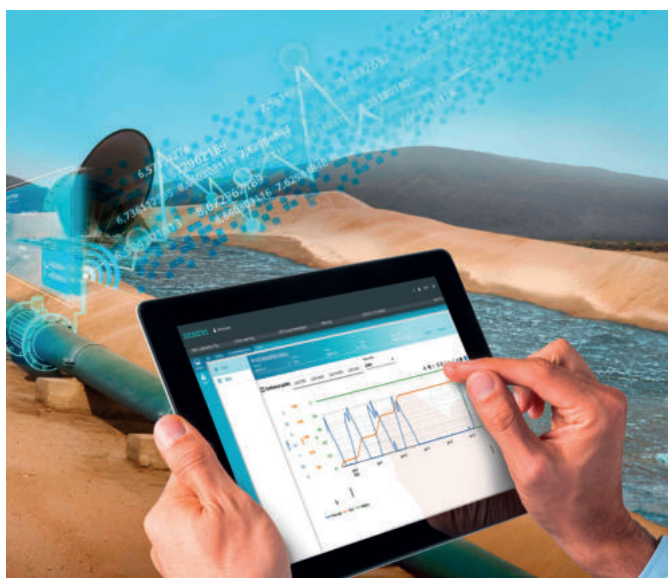
In a process facility, sensors are ideally located for a measurement task - but this often results in their placement in hard-to-reach places: in deep shafts, hidden in a tangle of pipelines or exposed on high tanks. Apps to the rescue: commissioning and parameterization of such field devices, such as those from the Sitrans LR100 device family, become exceptionally convenient with the Sitrans mobile IQ app.

To commission and set up such a compact 80 GHz radar transmitter, the user downloads the free app from one of the major stores to their mobile device and accesses the transmitter via secure Bluetooth connection. When the app is opened, all supported field devices in the environment are automatically detected and

displayed. Once the user enters the device PIN, they are granted access to individual transmitters. As soon as the device is connected, identification information is displayed, and users can now perform both a guided quick commissioning and a detailed setup.

Via the display of the tablet or smartphone, the technician can safely commission a Sitrans LR100 within a few minutes by entering several parameters such as operating mode, material, and application type. The app allows convenient viewing of measured values as well as echo profiles.

Even devices that are equipped with a service interface but no Bluetooth interface can be retrofitted with a Bluetooth adapter; examples are the current Sitrans Probe LU240 ultrasonic level transmitter or the Sipart PS100



Intelligent apps visualize events or measurement data in near real time





Cloud connectors are used to securely transfer measurement data from the field to the app and can be used there for analysis.

positioner. With mobile IQ and compatible Siemens field devices, commissioning and ongoing maintenance become much more efficient and convenient.

#### DATA CONNECTIVITY TO THE MOST DISTANT CORNERS

Process plants are never-ending sources of data. The comprehensive Siemens portfolio for flow, level, pressure, temperature or weighing technology makes a significant contribution to the availability of data.

In the following, however, we want to leave the completed, automated plants and instead look at measurement tasks that today are either not recorded at all or only with a great deal of manual effort. In the context of digitalization, data connectivity is now coming to the fore, and here Sitrans IQ covers two levels above the pure field device offering: on the one hand, the connectivity layer, or the extended communication options of the field devices themselves; and, on the other hand, the level of field device-specific apps, whether as an on-premises variant or in the cloud.

#### INVENTORY MANAGEMENT IN THE CLOUD

At least certain parts of most apps installed on mobile devices or PC screens actually run in the cloud. This has enormous advantages: cost-efficient and secure operation, fast response times, and availability of measured values - around the clock and around the globe.

Sitrans store IQ follows this approach: this tool for intelligent inventory monitoring and management uses the Siemens IoT platform MindSphere. The cloud-based app is open for almost any measurement technology

and allows for timely mapping of fill levels of tank farms or silos as well as stock levels in shelves - wherever there is no integration into an automation system, but measured values are still important. Because with the help of the values and Sitrans store IQ, users can optimize inventories and logistics processes. The application is based on what are called MindConnect elements, i.e., edge hardware that securely transfers measured values from the field to MindSphere, the leading industrial IoT-as-a-Service solution from Siemens. Well known connectivity hardware includes the Sitrans CC240 cloud connector or telecontrol units from the Simatic RTU3000C family. Once the data is stored in the cloud, Sitrans store IQ enables visualization. Users can calculate daily or summed values, display trends, and set up limit values - all based on values that are permanently updated. The user-configurable threshold values can then be used to issue alerts via email or SMS. Different basic subscriptions are based on the number of users or the number of assets monitored, allowing very cost-effective use and perfect scalability by the user.

#### ON-PREMISES PROCESS DATA COLLECTION FROM REMOTE SENSORS

But apps are not limited to mobile devices or the cloud, of course - they can also be run on locally operated industrial PCs or servers, even on virtual machines. One example of such an on-premises solution is Sitrans serve IQ. Widely distributed measuring points can be found in numerous applications, such as battery-powered flow measurements in water management. Typical users are public utilities, infrastructure operators (e.g. ports and

airports), but also manufacturing industries that report water withdrawals or intakes to environmental authorities.

Process data from these widely distributed or remote sensors are sent via cellular standards like 3G and 4G. Examples include the Sitrans FM MAG 8000 flow meter with a communication module already integrated, or the Simatic RTU3000C family of remote terminal units (RTUs). They send the data of any connected transmitters in the form of e-mails with file attachments.

Sitrans serve IQ receives this data, saves it locally and visualizes it. The app also supports the download of data series and it displays all sensors in a clear and geographically exact position. Other functionalities of Sitrans serve IQ include continuous monitoring of measured values within configurable upper and lower limits. User management allows the recorded remote sensors to be grouped and assigned to users according to their responsibilities. In this way, for example, an operator can transmit specific data to different customers in a targeted manner. Particularly convenient is the possible integration into existing SCADA systems via the IEC 60870-5-104 telecontrol protocol - this makes formerly isolated measured values available reliably and automatically.

Innovative apps combine with process instrumentation to form a powerful tool generating added value in industries across the globe. As a total system provider, Siemens delivers comprehensive solutions for its customers as a reliable partner for measurement tasks and for intelligent digitalization strategies.

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## Predictive Detection Tool for Paperless Recorders and Data Loggers

### Building AI-based detection tools without being a specialist

Yokogawa Electric announces the release of the Equipment/Quality Predictive Detection Tool. This addition to the OpreX™ Data Acquisition family is an AI-based tool for building equipment and quality anomaly predictive detection systems for GX series, GP series, and GM series SMARTDAC+™ paperless recorders and data loggers. With this software, even users who are not AI specialists will be able to build their own equipment and quality anomaly predictive detection systems for manufacturing sites. It will help them improve production efficiency by identifying equipment defects and deteriorating quality in their plants and other facilities at an early stage.

#### BACKGROUND

Recorders and data loggers are used at production and development sites in all kinds of industries to collect, display, and record data on voltage, current, temperature, flow rate, pressure, and other variables. As a leading company in this field, Yokogawa has provided many customers with data consulting services and technologies such as machine learning that can help them predict problems with plant equipment and product quality and analyze and identify causes. In recent years there has been a rising demand for AI-based solutions

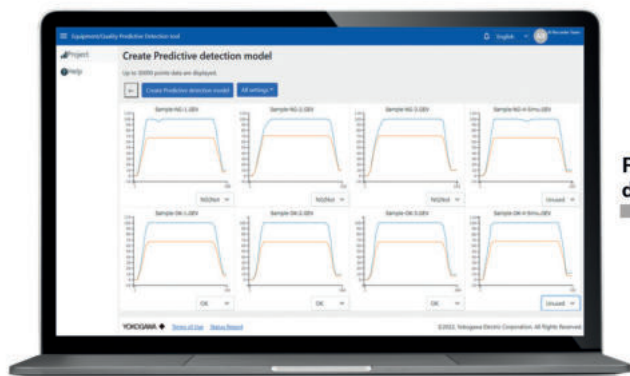
to improve production efficiency in plants. However, the hurdles for the application of AI are high as this requires significant expertise in specialized fields like data science. To address this need, Yokogawa has developed the Equipment/Quality Predictive Detection Tool, an easy-to-use AI-based software application for the recorders and data loggers that are commonly used in industry. To use this tool, no specialized AI expertise or consulting is required.

#### CREATING MODEL ON EXISTING DATA WITHOUT SPECIALIZED KNOWLEDGE

A predictive detection model can be created by importing past data into the software and simply flagging it as normal or abnormal, without needing to rely on an AI expert or consultant with knowledge about machine learning, algorithms, etc. Data recorded with Yokogawa and other companies' products can be used. Simulations can be run in advance to see how the AI assesses the data.

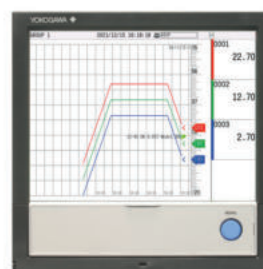
#### BUILDING A PREDICTIVE SYSTEM EASILY

By loading the predictive detection model created by this software into the SMARTDAC+ on site, an equipment and quality anomaly



Equipment/Quality Predictive Detection Tool

Predictive detection model

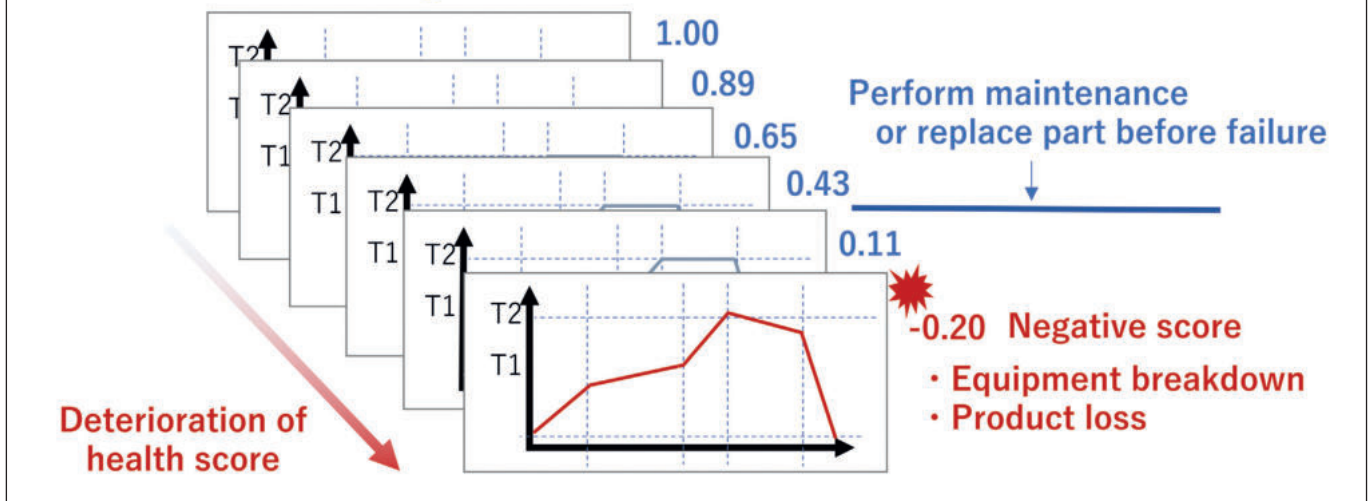


SMARTDAC+





## Abnormal signs can be detected with the health score



predictive detection system can be constructed. The degree of equipment deterioration can be confirmed before failure by checking the health scores. These health scores enable operators to be informed by alarm or e-mail when equipment needs maintenance, minimizing the likelihood of an unexpected breakdown that can impact production activities.

### CLOUD OR OFFLINE VERSION

The Equipment/Quality Predictive Detection Tool will be available as both a cloud and an offline version. The equipment and quality anomaly predictive detection system can be built using either version. The cloud version is more easily available and does not require any installations on a PC.

### SAMPLE APPLICATIONS

#### 1. Managing temperatures and pressures in tire production (vulcanization)

Pressure leaks due to packing deterioration and so on are an issue with the vulcanizers that are used to apply heat and pressure to tire rubber. By using the Equipment/Quality Predictive Detection Tool to monitor changes in a health score that is generated based on a vulcanizer's pressure readings, signs of packing deterioration can be detected at an early stage.

#### 2. Managing the thermal treatment of aerospace and automotive parts

In the thermal treatment of aircraft and automotive parts, issues like bad burners and inadequate sealing can lead to furnace downtime and poor product quality. The Equipment/Quality Predictive Detection Tool will enable signs of temperature problems to be detected before an alarm is triggered, so users can avoid product loss and predict when to perform maintenance.

#### 3. Managing sterilization of food and drug products

With the vacuum sealing of food and drug products after they have been sterilized, unexpected equipment breakdowns can bring the production line to a halt and result in product loss. The Equipment/Quality Predictive Detection Tool will enable the detection of loose valves and packing deterioration before an alarm is triggered, so users can prevent equipment breakdowns and reduce product loss.

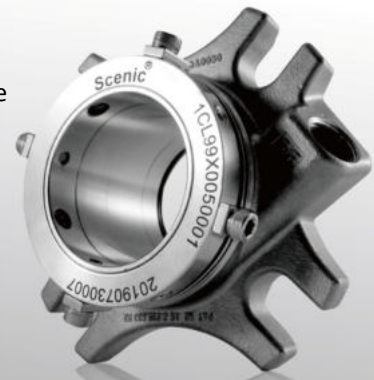
Major target markets are production sites for a broad range of industries, such as steel, power, chemicals, pulp & paper, food, pharmaceuticals, water and wastewater treatment, and electronics. But also consumer electronics, automobiles, semiconductors, and new energy development departments; university and public sector research institutions will benefit from use.

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# Cloud-Based Fluid Management Allows Innovative Opportunities

Cloud-based, smart solutions deliver transparent, digital communication. ProMinent's web-based platform ensures safe monitoring of system statuses and process data in the cloud from any location. This allows operators in various sectors to improve their process reliability and system efficiency.

The complex procedures prevailing in chemical plants and the process industry must not be interrupted, require high availability and must be safe. And they often involve the storage, transport and processing of chemicals that are harmful to health. At the same time, the processes need to run with maximum energy savings, maximum conservation of resources and maximum environmental protection. Monitoring and controlling the interwoven processes lead to an ever-increasing amount of data and information, which need to be made as transparent as possible.

If network-compatible components, such as metering pumps, disinfection systems, controllers and sensors are intelligently linked up, new opportunities occur:

- Timely response: all relevant system data is available at all times and from any location e.g. status, functionality, etc.
- Safe working: because the precise process and system status can be accessed digitally, there is no need for workers to go into potentially dangerous environments.
- More efficient service: accessing status and performance data from any location reduces travel for purely inspection and documentation purposes.
- Reliable storage and documentation: all measured values and system data are reliably stored in the cloud and protected from manipulation and loss of data. Regulatory documentation obligations can be met with ease.

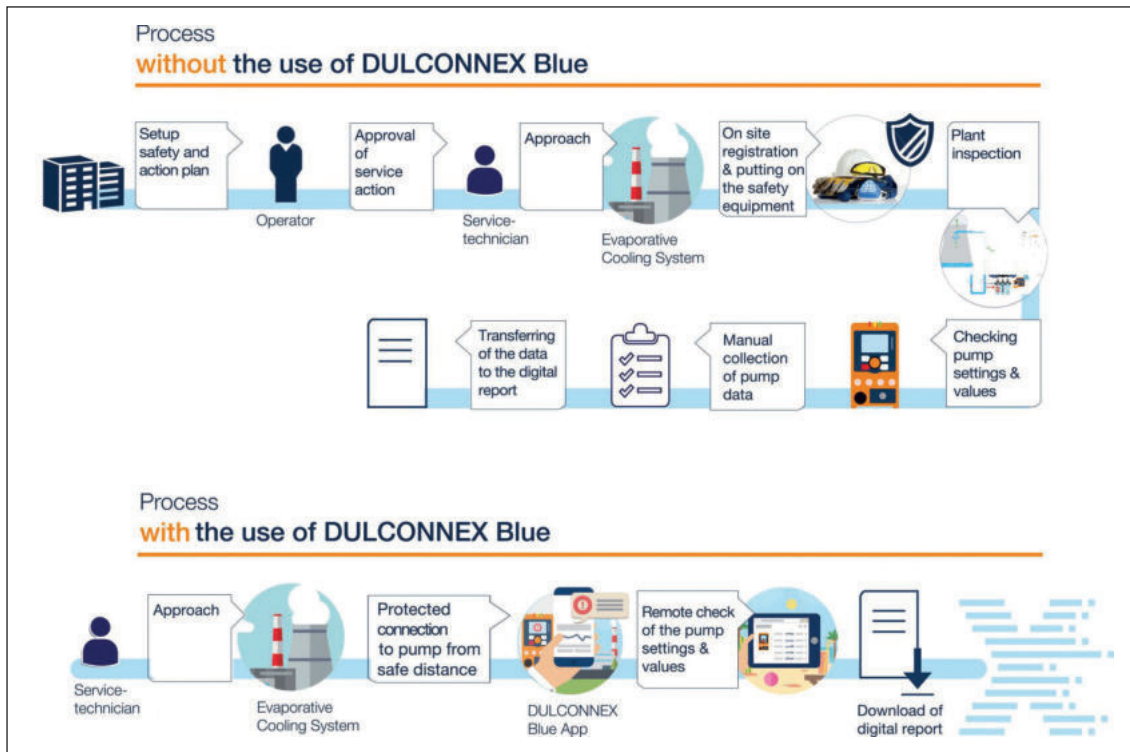
## SINK DISINFECTION: CONSTANTLY KEEPING AN EYE ON THE CONSUMPTION OF CHEMICALS

The Blanco group is a German manufacturer of kitchen fittings, including granite sinks. Holes for taps and accessories are milled during the sink production process. The milling machines operate in the dry, i.e. without any water, which leaves the sinks very dusty. The last stage of the production process is to wash them so that they can be packaged clean and free of germs. To minimise the amount of water in circulation for cleaning the sinks and therefore to minimise the consumption of fresh water, it has to be treated. The kitchen manufacturer uses hydrogen peroxide to do this. In accordance with EU Ordinance 2019/1148, it must be possible for consumption and use of this chemical to be meticulously traced at all times because it is considered a raw material for explosive substances. Using the intelligent ProMinent metering pump gamma/ X, the delivery volumes of the hydrogen peroxide solution are recorded as required by law and saved in a controller by means of an SD card. With its Teflon diaphragm, the intelligent pump is also ideally suited to metering the aggressive and out-gassing disinfection solution into the washing water.

During disinfection, the concentration of the washing solution is continually measured using a sensor for hydrogen peroxide. The controller keeps the H<sub>2</sub>O<sub>2</sub> concentration con-

*In the last stage of the production process, these kitchen sinks are washed so that they can be packaged clean and free of germs. The washing water has to be treated and ProMinent provides the technology to do this.*





Service process followed by SUEZ WTS France before using the gamma/ X and after deployment of the innovative pump with Bluetooth function and DULCONNEX Blue App.

stant. A liquid level indicator issues an alarm in good time if the hydrogen peroxide needs topping up.

The benefits for Blanco at a glance:

- Assurance of chemical supplies: a predictive alarm is issued as soon as chemicals need topping up.
- Consumption reports: no extra work or time is needed to ensure the compliance stipulated by law.
- Assurance of continuous production: deviations in the process trigger an alarm in good time, e.g. if a filter needs replacing, so there are no production downtimes. This is important in a company that runs a five-shift operation to produce a million sinks a year.
- Site-wide recording: chemical consumption can be globally determined in an instant.
- Elimination of manual processes: reports no longer have to be produced and evaluated by hand.
- Everything comes from one source: ProMinent supplies the complete hardware solution (metering pump, controllers, sensors) and the IIoT system networked into this for digital fluid management.

**APP-BASED COOLING TOWER DISINFECTION**  
Suez Water Technologies & Solutions (WTS) France is part of the international Suez group, which delivers industrial services and solutions. One of the company's remits is respon-

sibility for operating evaporation cooling systems. Chemical biocides are used to disinfect cooling towers. These have to be used to free the inner chamber of the cooling towers of naturally occurring legionella.

To supply these chemicals, Suez Wts France uses the intelligent metering pump gamma/ X with integrated Bluetooth module, which allows the pump to be remotely controlled using a mobile app. Thanks to the free DULCONNEX Blue App, service technicians can easily control the gamma/ X pumps on their smartphones from a safe distance. The mobile app gives them central access to all the data from linked devices. The current system performance data can therefore be called up using remote access, settings can be adjusted in real time or pump capacity and metering volume can be directly regulated. This is of major benefit to industrial areas of application where pumps are often hard to access or where protection involves stringent safety measures.

#### REMOTE ACCESS FOR MORE EFFICIENT SERVICE PROCESSES

By using the DULCONNEX Blue App, Suez Wts France has been able to not just improve safety for its service technicians but also make what used to be an expensive and time-consuming process much more efficient. Before they used the gamma/ X, whenever a service incident occurred or an error/problem was reported, Suez Wts France first had to

produce a plan of action and safety measures and have this approved by the operator of the evaporation cooling system before a service technician was able to set out for the system. Once on site, the technicians had to first identify themselves, register with the system and put on appropriate protective equipment. Only once kitted out in protective equipment could access be gained to the affected evaporation cooling system where the service technician could read the pump values and settings and manually record them. Having removed the protective equipment and left the system, the service technician had to then transfer the manually recorded data into a digital report.

#### TIME SAVINGS OF UP TO 60 MINUTES

Since switching to the innovative gamma/ X with DULCONNEX Blue, Suez Wts France is now saving up to 60 minutes per service incident. The service technicians travel to a location close to the facility and, following authentication from their cars via their mobile phones, can establish a secure connection to the pump. Pump values and settings can be accessed via the app and all relevant data can be exported to a digital report at the click of a button. There is no need for the entire creation and approval process required in producing a plan of action and safety measures in agreement with the system operator.

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# Integrate Your Field Data

Standardization provides the basis for digitizing the process plant

Digitizing the field level of a process plant presents its operators with special challenges. They are faced with the challenge of condensing data into information with concurrent operation of several generations of devices and communication technologies. This article describes approaches to standardizing and implementing the data integration of different technologies.

## LANGUAGES FOR DIFFERENT PURPOSES

Semantics define a common representation of like data. The NAMUR Open Architecture or Open Process Automation define frameworks. A main feature of NOA is definition independent of basic process control architectures, which can remain untouched while deploying digitalization to enable state of the art maintenance and operations procedures with legacy and existing field instruments. Cloud protocols with ingredients such as REST API, MQTT, keys, certificates, etc. are all IT standards enabling dash boards based on large data bases derived from the instruments.

With Ethernet as the physical language in homes, offices and manufacturing, the field of process plants now has its standardized physical layer dialect named: Ethernet-APL. It ruggedizes Ethernet to meet the needs from the field of process plants with long cable lengths, sturdy installation technology, power and communication over one cable and integrated and simple explosion protection with intrinsic safety. Finally conformance testing, which is mutually developed, agreed and accepted by the four major standards organizations serving process industries, provides users with the assurance of compatibility and thus reliable operations of both, hardware and software.



Communication for Process Industries

As a specialist for infrastructure, sensor technology, and communication, Pepperl+Fuchs is committed to all topics and is thus actively driving standardization. Only a stable footing rooted in open and accessible standards will provide benefits of all market participants.

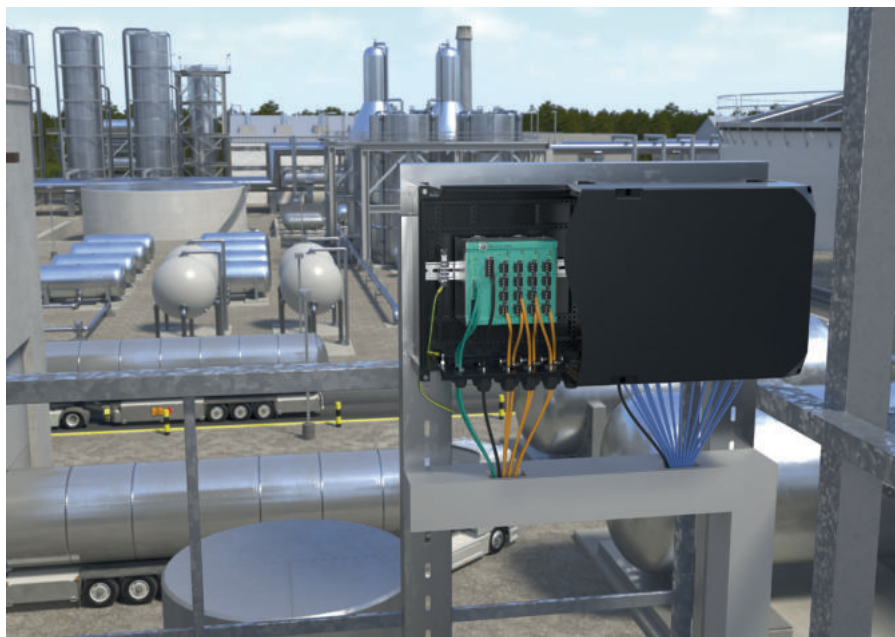
## ACROSS ALL AGES AND TIMES

Ethernet as transmission media provides the basis for industrial IT beyond the controller. It offers parallel access for standardized protocols with semantics. Data acquired from the field originates from classic 4-20 mA signals, field devices with fieldbus and soon native, Ethernet-based communications. To gain the benefits of data analytics, the user challenge is to gather this data with a minimum of interfaces and convert it for transfer to any system. Remote I/O installed in the field solve demanding tasks of adapting information from

the installed field device base to the new M+O tasks to achieve investment protection. They are designed for challenging environmental conditions requiring intrinsically safe explosion protection and the associated power limitation. Remote I/O are ideally suited to provide all M+O data from field devices via Ethernet. Edge gateways or other IIOT components can then process this data and pass it on to applications in the cloud e.g. via OPC UA. This enables users to deploy the NOA information model and the NOA diode in the field for legacy devices.

Cloud infrastructures provide both, storage capacity and computing power in a scalable manner. Now, suitable procedures and architectures must be agreed upon in order to provide the M+O data in a structured and uniform manner for processing in data platforms. The Reference Architecture of the Open Industry





Junction Box that can hold Remote I/O and Ethernet-APL switches near the instrument.

the Manchester Bus-powered Physical Layer (MBP) and can thus be configured quite flexibly to the installed base of PROFIBUS PA devices. It thus enables the simultaneous operation of new APL and existing fieldbus field devices on a common infrastructure.

Pepperl+Fuchs offers complete solutions for the integration of existing devices, migrations and plant expansions to the latest technology and new plants - all with connection to industrial IT via Ethernet. With complete solutions, even for hazardous areas, users can easily invest in the digitization of the process plant. The lifespan of the process plants thus sets the direction: For the next 20 years, the right mix of technologies will determine the success of digitization.

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4.0 Alliance provides a vendor-independent solution to easily implement end-to-end communication from the field device to the cloud, even in heterogeneous environments. Finally, Ethernet-APL has the potential to establish itself as a new, sustainable and trend-

setting infrastructure for new installations and expansions. Fieldbus and Ethernet-based protocols can communicate over a common infrastructure with the Ethernet-APL Field Switch of the FieldConnex® product family: in addition to Ethernet-APL, the Field Switch also handles



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# Compact Conductivity Sensor

## High temperature stability allows use in CIP and SIP applications

The new Baumer PAC50 process sensor allows conductivity measurement with a small footprint and is perfect for small-sized production installations. The new product scores with high performance tightly packed in a very compact design. The sensor fits for use in small production facilities - in general industrial applications but especially in the food and pharmaceutical industries. Its high temperature stability up to 140° Celsius allows for permanent and reliable use even in SIP systems.

Baumer now offers the little brother of the proven AFI4/5 series, a powerful sensor that easily integrates into tight production lines. Since here often a single millimeter counts. To realize the required level of compactness,

when developing PAC50 the Baumer engineers went to the limits of what is physically possible. And they succeeded. The sensor housing measures a mere 60 millimeters.

### ROBUST AND DURABLE

In addition to the compact design, PAC50 stands out by its robustness and durability. Thanks to the sensor tip in one-piece design it better withstands strong and frequent temperature fluctuations than sensors do with a two-piece tip. It delivers reliable performance even at temperatures of up to 140 degrees Celsius. Thanks to the sensor tip made entirely of high-performance plastic poly ether ether ketone (PEEK), it is also extremely resistant to chemicals. PAC50 in

its H version is hence ideally suited for CIP. Another bonus point is the all-stainless-steel sensor housing with all parts laser-welded. PAC50 in its H version complies with the EHEDG (European Hygienic Equipment Design Group) hygiene standard applied to the food, beverage and pharmaceutical industries and is 3-A certified. All media-contacting parts are FDA certified.

### ANALOG AND DIGITAL INTERFACE

With IO-Link as standard feature the PAC50 allows collecting secondary data such as temperature for process monitoring and communication to the controller. Via the IO-Link interface users can easily and quickly parameterize the sensor prior to and in operation - even when the sensor is integrated via an analog interface. The Dual Channel feature allows users to operate PAC50 via analog or digital channel or even both in parallel.

To optimally match different pipe cross-sections Baumer offers the PAC50 with three different sensor lengths: 37, 60 and 83 millimeters. Customers have the choice between the H and S sensor variant according to market requirements. The H variant features a sensor tip made of primarily produced PEEK (FDA certified). The S variant uses recycled PEEK granulate and this way Baumer supports companies aiming on more sustainable production. The sensor can be ordered with or without display. The display enables convenient sensor settings via touch operation and flexible colors of backlighting provide information on the process status.



►► 62297 at [www.pcne.eu](http://www.pcne.eu)



## DECENTRALIZED I/O SOLUTIONS IN EX AREAS

Block I/Os enable cabinet-free modularization in Zone 0



Turck has approved its IP67 block I/O modules for the TBEN-S and TBEN-L versions for use in Zone 2. The automation specialist is thus the first supplier to enable cabinet-free decentralized automation solutions with ATEX and IEC Ex approval, and thus considerably

reduce the required mechanical labor, wiring and also commissioning times. In conjunction with the devices of the IP67-rated IMC interface series, it is even possible to implement the cabinet-free connection of intrinsically safe signals from Zone 0 or 1. Users can also implement cabinet-free safety, RFID, IO-Link, controller or cloud solutions directly in Zone 2 since virtually the entire Turck IIoT eco system is offered in these designs. Users must also install protective housings when implementing the I/O solutions in Zone 2. They provide protection against shock and sparking caused by the accidental removal of cables. Applications requiring FM approval can also be operated without housings. The ARGEE logic software on the I/O modules enables autonomous applications to be implemented directly in Zone 2. This is useful for retrofit applications since existing controller systems do not have to be adapted. Condition monitoring via cloud systems can now also be implemented from Zone 2 without the need for a control cabinet.

►► 62132 at [www.pcne.eu](http://www.pcne.eu)

## IEC 62443-4-2 CERTIFIED ETHERNET SWITCHES

Futureproof secure switches for resilient networks



Moxa announced the launch of its next-generation industrial Ethernet switches, the EDS-4000/G4000 Series with 68 models that will help customers build futureproof industrial networks to strengthen operational resilience in industrial spaces. As the number of connected de-

vices in industrial operations grows exponentially, the EDS-4000/G4000 Series provides multiple interface combinations with up to 14 ports and a range of options including fast Ethernet, Gigabit, 2.5GbE uplinks, SFP, and IEEE 802.3bt PoE connectivity. This enables customers to connect more devices especially in applications that require high-power and high-bandwidth networking. The EDS-4000/G4000 Series was the world's first IEC 62443-4-2 certified Ethernet switches to be certified by IECCE due to the built-in hardened security that was developed by following the stringent software development lifecycle described in the standard. The series is certified for NEMA TS2, EN 50121-4, IEC 61850-3/IEEE 16132, DNV2, ATEX Zone 23, Class I Division 23, to fulfill the needs of a wide variety of industrial applications. The series also features Turbo Ring and Turbo Chain fast network recovery to ensure smooth operations.

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## RADAR SENSOR FOR LEVEL MEASUREMENT

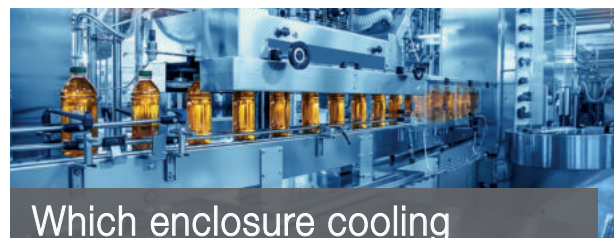
Quick and easy to install device for versatile applications



With VEGAPULS 6X, VEGA radar "thinks" in a new way. The result: A new radar sensor that can measure in every conceivable level application. The new VEGAPULS 6X offers the best that is technically feasible today: a self-diagnosis system that immediately detects damage or interference that ensures significantly higher availability and safety, it has new radar-chip technology, with expanded application possibilities and simpler operation. In addition to

SIL certification, the matter of cybersecurity has also been fully taken into account: Compliance with security standard IEC 62443-4-2, which specifies the strictest requirements for secure communication and access control. Level sensors should make it easier for users to monitor their industrial processes. The ultimate purpose of VEGAPULS 6X is maximum simplification. It is the one sensor that can handle any application. In the future, the customer will no longer have to worry about the technology, frequency or instrument version. Even setup and commissioning has been reduced to a minimum, requiring now just a few clicks and basic application parameters. In many cases, all application-specific settings can be made in VEGAPULS 6X before it leaves the factory.

►► 62155 at [www.pcne.eu](http://www.pcne.eu)



Which enclosure cooling measures for Food & Beverage?



To guarantee an adequate corrosion protection and easily cleaning, Fandis offers a **stainless steel hose-proof hood UL Type 4X for filter fans**, that effectively safeguards against water jets and foreign particles by securely sealing the ventilation openings (FDA-compliant).



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# Fast Coupling Device for Diaphragm Seal Systems

For safe and leakage-free decoupling for process connections and measuring devices

It is normally necessary to remove the process connection in order to replace or calibrate a measuring device. This causes an interruption to the process and what is more serious it leaves an opening. It is also a complicated, time-consuming and costly procedure, especially for hygienic processes or those involving toxic or sensitive substances, such as in the pharmaceutical industry, or in especially complex plants, such as in the chemical industry.

## NO OPENING OF THE PROCESS AVOIDS DANGER OF PRODUCT LOSS OR AIR INTAKE

Originating from an idea expressed by a sales employee, LABOM has developed the REconnect fast coupling device and applied for a patent. The new fast coupling device is installed between the measuring device and the process connection and in particular facilitates handling when measuring systems are mounted with a capillary, such as on vessels with large heights, when there is restricted space or in plants that are difficult to access. Operated by a special lock, it makes safe and leakage-free decoupling of diaphragm seal systems possible without affecting oil volumes and without loss of oil or intake of air. This means that the process no longer has to be opened to replace or calibrate mea-



suring instruments, because the diaphragm seal remains connected to the process. Subsequently, the measuring device and diaphragm seal are just as easily recoupled and the plant can immediately be put back into operation. This special separation process makes it possible to repeat the procedure as many times as necessary.

REconnect also offers a solution for mobile vessels, because it is no longer necessary to dismantle all the measuring systems, for example, while autoclaving the vessels. Another plus is the ability to keep a stock of replacement diaphragm seals that can be easily exchanged during an overhaul.

## SECURED AGAINST ACCIDENTAL OR UNAUTHORIZED USE

REconnect consists of two parts – one fitted to the measuring device, the other to the process connection – and with the aid of the special lock, they are easily separated. The lock is detachable and can be retained separately so that REconnect cannot be operated accidentally or by unauthorised persons. After separation, the two parts of the coupling are each closed with covers made of stainless steel to protect the measuring instrument and diaphragm seal. The fast coupling is vacuum-proof and has no parts that can be lost. It is suitable for all applications, whether in the

pharmaceutical industry, the food industry or in the chemical industry. Furthermore, REconnect is suitable for ex-protection and can be combined with all LABOM devices (mechanical or electronic) for measuring temperatures, pressure or levels and diaphragm seals.

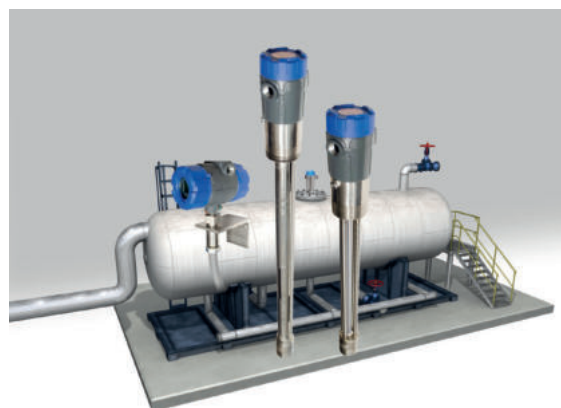
►► 62108 at [www.pcne.eu](http://www.pcne.eu)





# Multiphase Level Detectors

Measuring various layers in interface applications accurately



Multiphase level measurements exist throughout process industries. They are especially significant in the oil & gas and petrochemical sectors due to the value derived from effectively separating water and hydrocarbon. While level instrumentation has come a long way in measuring liquids of all varieties, multiphase level measurement remains challenging.

Magnetrol-AMETEK announces the new Genesis™ Multiphase Detector for multiphase detection, measurement, and control. It is designed

to measure multiple phases in applications with thick and dynamic emulsion layers and therefore is able to differentiate the following different phases in a tank: vapor, total level (e.g., hydrocarbon liquid), top of emulsion layer, bottom of emulsion layer (e.g., water level, sediment).

#### TIME DOMAIN REFLECTOMETRY

For measurement the TDR (Time Domain Reflectometry) technology is used. In this pulses of electromagnetic energy measure distances

or levels. When a pulse reaches a dielectric discontinuity (created by the surface of a process medium), part of the energy is reflected. The larger the dielectric discontinuity, the larger the amplitude of the reflection.

The detector has a 24VDC input with four 4-20mA outputs, (including HART) for control of the different levels. The signal is concurrently generated top-down and bottom-up for best measuring results.

▶▶ 62562 at [www.pcne.eu](http://www.pcne.eu)

## NEW FLOWMETER INTERFACE SOFTWARE

Improves functionality and remote control capabilities



**Titan Enterprises'** Atrato line of patented ultrasonic inline flowmeters consists of four models operating over a flow range of 2ml per minute up to 20 litres per minute. The USB connection gives the Atrato computer interface capability,

enabling the user to directly monitor the flow rate being measured and alter the operating parameters using a PC. The new interface software features four key functionality improvements: The ability to connect, configure and operate multiple Atrato flowmeters on a computer simultaneously whilst minimising CPU usage is one. Others are capability to run simple local and remote-control batching operations using an inbuilt relay, remote start/restart for long shut-down periods and the ability to increase signal gain via the software for liquids with poor acoustic properties. The Atrato interface software enables the user to log the flow data directly via USB. This data-logging capability gives a continuous picture of the flow characteristics of the system being monitored, such as flow, alarms, relay and pulse. The upgrade integrates developments in both the Atrato's internal software and the PC interface software, providing increased versatility and advanced operational features, giving a convenient platform for users to integrate into their processes or systems and supporting better diagnostic capability.

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## COMPACT PRESSURE SWITCHES WITH IO-LINK

Multi-rotatable LED display and adjustment module



**KROHNE** introduces OPTIBAR PSM 1010 and OPTIBAR PSM 2010 ultra-compact pressure switches for absolute and gauge pressure measurement in gases and liquids. Both devices aim at basic automation applications. Target industries include food and beverage, (waste-)water, environmental and OEM process equipment applications with restricted installation space. The new switches feature a

2-axis (multi-rotatable) display and adjustment module, a robust construction (IP67), and fully configurable communication outputs for all possible configurations: IO-Link and PNP/NPN as standard I/O, and 4...20 mA, 0...10 V or NPN/PNP as secondary output. Both devices offer excellent temperature stability due to advanced digital compensation. PSM 1010 is suitable for liquids and gases from 0.1...600 bar with process temperatures up to +125°C and excellent overload resistance. PSM 2010 aims at hygienic applications in the food and beverage industry from 0.1...40 bar and max. +150°C. Its hygienic construction features a fully welded front-flush diaphragm to meet the most stringent industrial requirements in terms of crevice-free installation with several 3A approved process connections.

▶▶ 62234 at [www.pcne.eu](http://www.pcne.eu)

# Accelerated Asset Inspections with Advanced Software Features for Reporting

Pre-planned routes and faster report compilation for optimised inspection processes

British inspection specialist PFE Limited uses FLIR Thermal Studio software to accelerate site inspections and reporting, and to deliver consistent reporting quality to its demanding customer base. Based in Wallasey, North-West England, PFE Limited is a family-owned business, specializing in a wide range of inspection and reliability services for industrial customers. The company has been using thermal imaging for more than 15 years for mechanical, electrical, and process-related inspections. One of the more specialized types of inspections that PFE Limited offers are furnace inspections, for which the company is using a FLIR Exx-Series pistol-grip camera.

## PRACTICAL, ALL-IN-ONE INSPECTION TOOL

The most tangible output that the company is offering to its customers are reports, so it speaks for itself these need to be of consistently high quality. PFE Limited therefore relies on FLIR Thermal Studio software with routing functionality from the FLIR Route Creator plugin. "We used to go on site for our inspections, combining the use of a thermal imaging camera with some kind of clipboard or electronic tablet," says Jake Ford, Reliability & Mechanical Engineer at PFE Limited. "For every asset and every image taken with our thermal camera, we used to jot down numbers and comments on a separate device. This was

not only unpractical, but it also took twice the time we spend on inspections today."

## PRE-PLANNED ROUTES

The PFE Limited team especially values the FLIR Route Creator plugin, which allows users to create pre-planned routes in FLIR Thermal Studio for their inspections. Routes can be downloaded to any FLIR thermal camera that has FLIR Inspection Route on-board software, and then run from the camera itself. This means inspectors no longer need to carry two separate items—which is much more practical—helps them stay organized when surveying large or multiple locations, and above all, ensures they don't miss any assets or inspection areas.

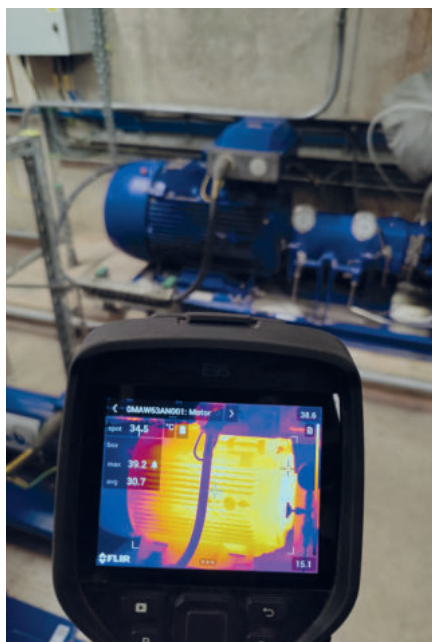
Also, inspection routes are not always linear: PFE Limited engineers do not always follow the same order. They often skip certain assets and need to go back and forth on different moments in time. With a simple clipboard or tablet, the risk of missing assets from inspections is much higher. When Inspection Route is active on the camera, the progress in the pre-planned route is always clearly visible and the software tells the user exactly which assets are left to do. "A typical furnace inspection used to take us about four hours. Now, we can easily complete it in two hours," says Ford.

## REDUCED DESK TIME

The time at the desk which is needed to compile the report is also significantly reduced. Thanks to FLIR Thermal Studio, users just need to open the file that is generated by Route Creator, and the images are already assigned to an asset. This makes the analysis



and reporting much faster and easier. "Desk time often used to involve working with spreadsheets or comparing thermal images with other files. This was a cumbersome and slow process, and prone to errors. With Thermal Studio, the reporting part has become a much cleaner, smoother and more consistent process," says Ford. FLIR Thermal Studio enables users to post-process images in batch. This accelerates the entire process and reduces desk time significantly. "Especially, with furnace inspections, there is often some post-processing involved," Ford explains. "Obviously, hot spots are part of a furnace, so not every hot spot is problematic. This means that we often have to manipulate the image and demarcate or annotate the area of interest. We can now choose to present the images in FLIR's UltraMax® mode, rotate them and draw a square around them, all in one single batch process. Before using FLIR Thermal Studio, we needed to do this on each individual image, now we can do this in batch. This makes FLIR Thermal Studio a huge time-saver."



FLIR Thermal Studio also makes it easier for the PFE Limited team to compile the detailed and vast reports which are required by

some of the company's insurance customers. These annual insurance reports often include hundreds of images, each of which needs to be represented on a single page. Without FLIR Thermal Studio, creating one page used to take a few minutes. With the batch process in FLIR Thermal Studio, the entire report can be set up in a matter of minutes.

#### COMPETITIVE ADVANTAGE

"As a small business, it's super important to be conscious of our time," says Ford. "We want to efficiently squeeze our time to keep all our customers happy, because customer satisfaction is our prime focus. FLIR Thermal Studio allows us to be faster on site. In terms of health and safety, that's already a plus, because the less time our inspectors need to spend near hot furnaces, the better. More generally speaking, it also means that we can do our job in less time and be more cost-efficient compared to our competitors."

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# Maximum Safety and Efficiency During Filling

Pharmaceutical powders form the basis for numerous antibiotics that are essential for comprehensive medical care. However, margins are low and production conditions are complex. This has led to a shift of manufacturing capacities to lower-cost markets. With this development in mind, how can supply bottlenecks be avoided? And what does it take to revive local production?

Antibiotics such as cephalosporins or penicillin are a proven therapeutic approach for common conditions such as pneumonia or tonsillitis. To bypass the gastrointestinal tract and increase the effect of the drug, patients often receive infusions based on antibiotic powders. The infusion fluid is formed shortly before administration by adding purified water. It is precisely this powdered form of the antibiotics that makes the manufacturing process highly complex.

## HIGHLY COMPLEX PRODUCTION CONDITIONS

Take the example of penicillin: the filling specifications are particularly strict. According to the U.S. FDA, for example, manufacturers are obligated to isolate filling machines and equipment. They must also ensure separate air supply and filtration and carry out regular tests for residues of the drug. In many cases, even separate factories are needed to comply with these requirements, which in turn leads to completely secluded internal production sites with separate offices and canteens for the different shifts to ensure operator safety – a highly necessary requirement, but also a huge financial expense.

## UNEVEN PRODUCTION DISTRIBUTION

Not all antibiotic manufacturers are or will be able to afford this kind of investment. Hence, the migration of global production capacities to Asia already began decades ago, according to a study on the security of supply of antibiotics by Pro Generika (conducted by Roland Berger). In the 1980s, for example, China started subsidizing domestic antibiotic production. Economies of scale soon

emerged, enabling manufacturers to produce large quantities of antibiotics at low prices. At the same time, the production of generics became more cost-intensive in the Western world. Increasingly demanding audits were one of the driving cost factors. Expiring patents of Western manufacturers further increased the market demand for economically viable production capacities. Many manufacturers found these in China and India.

## AUSTRIA: A SPECIAL CASE

The Covid-19 pandemic has shown that such regional dependencies can be somewhat problematic: in the event of supply bottlenecks, physicians must prescribe broad-spectrum antibiotics more frequently, which increase the likelihood of patients develop-

ing resistance. To counteract this development and to ensure more stable availability on the market, antibiotic manufacturers, physicians, and pharmacists' associations, as well as politicians are calling for a global redistribution of production capacities. Austria shows how this can be done with a government that supports the only site in Western Europe that both produces and fills antibiotics with extensive investments.

## THE ROLE OF MACHINE MANUFACTURERS

At the moment, it is difficult to predict whether other countries and manufacturers will follow this strategy. However, setting up similar programs would certainly help the market availability of antibiotics in different continents. Apart from suitable



*The powdered form of the antibiotics make the manufacturing process highly complex.*





*The AFG 5000 from Syntegon processes up to 480 vials per minute with a transport system that varies between continuous and intermittent transport.*

production sites, programs like this require extensive knowledge of the pre-requisites for antibiotic powder production and fill-finish operations, as well as efficient equipment that meets all regulatory requirements and is geared towards high efficiency. Of course, machine manufacturers cannot solve the challenges on their own. But they can contribute their long-term knowledge and existing technological solutions to change things for the better.

#### AIR SUPPLY AND HYGIENE IN THE FILLING AREA

While liquid pharmaceuticals already present numerous challenges to filling operations, pharmaceutical powders add an additional level of complexity due to their consistency. The finely ground active ingredients generate dust easily. Hence, machine operators must be protected from these sometimes-toxic ingredients and vice versa (i.e. to prevent cross-contamination): dust-tight barriers and a sealed air supply with efficient and powerful filter systems are essential in the filling area. For instance, an extended UDAF ventilation system cleans and tempers the circulating air of the filling area and regulates humidity. Machine cleaning is also particularly complex with powders, as the fine dust particles can settle anywhere within the machine. An open design, easy accessibility, and CIP-SIP for cleaning the product in-feed system provide a remedy.

#### SIZE AS A COST FACTOR

The larger the filling area of a machine, the higher the costs for containment, filtration, temperature control, operation, maintenance, and cleaning. Every centimeter counts; especially in cleanroom class B, where powders are usually filled. A vertical design with good accessibility and the possibility of wall mounting with maintenance options outside of the filling area offer enormous advantages. If the filling area is additionally separated from the infeed and outfeed, the space that must be dedusted and cooled with sterile dry air is reduced. A modular design that offers pharmaceutical manufacturers the flexibility to choose between different filling and weighing modules provides further space savings. In addition to size, time is another decisive factor for cost reduction: the faster format parts can be changed and the fewer product-contacting parts there are to clean, the faster a new batch can be initiated.

#### VARIABLE TRANSPORT FOR OPTIMAL SPEED

For example, the AFG 5000 from Syntegon processes up to 480 vials per minute. This is possible thanks to a specially developed transport system that varies between continuous and intermittent transport: while the vials enter the system continuously, the transport system precisely adjusts the speed as they progress to the individual workstations such as filling, weighing or stoppering to avoid de-

lays in the workflow. The vertically circulating transport system is designed to avoid idle times or jams. The carrier systems transport the vials to the respective workstations safely and quickly. As soon as the vials have been stoppered and are discharged, the shuttles return to the infeed in fast mode and are ready for the next transport. The 100% in-process control avoids any unnecessary product loss – a further important advantage to produce cost-sensitive antibiotics.

#### COMBINING SAFETY AND EFFICIENCY

If drug manufacturers want to be on the safe side when deciding on a particular fill-finish system, an early cooperation with a leading machine manufacturer is highly recommended. With more than 230 machines sold globally, Syntegon has been supporting customers in pharmaceutical powder filling for more than 60 years. The Syntegon experts are continuously passing on their extensive experience, for example in the powder lab in Crailsheim, Germany, where they support pharmaceutical manufacturers in selecting the ideal filling system, determining the optimum setting parameters, or carrying out basic tests. The goal is to combine maximum safety for operator, product, and patient with optimum efficiency – and thus contribute the equipment prerequisites for a regional antibiotic production strategy.

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**Powtech**  
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Nuremberg  
[www.powtech.de](http://www.powtech.de)

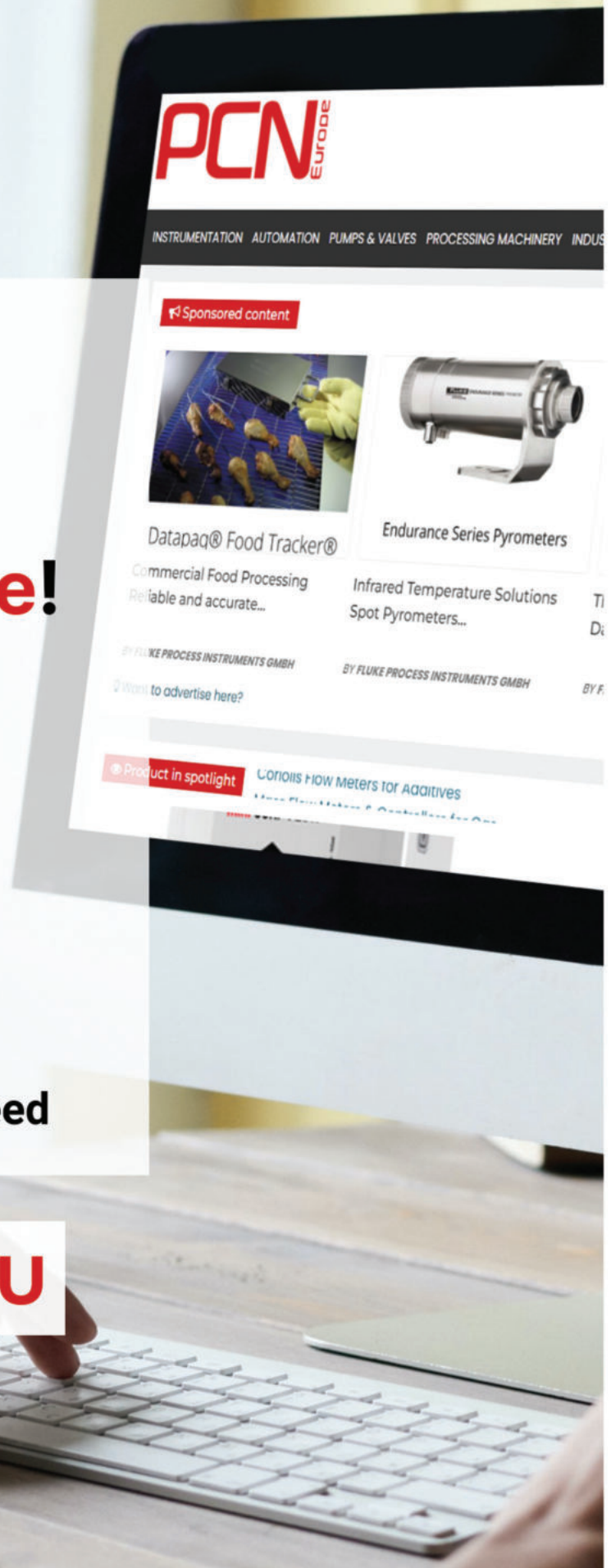
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