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MARCH

PCN Europe

processing & control news

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Here We Go. Again

The new year has started and is passing so quickly that we are already in March, the month that marks the beginning of the "editorial year" for PCN Europe. We consider it as our **New Year's celebration** issue and for this reason we decided to put a lot on our plate, **from the starter to the dessert**.

As a starter, we offer you a brief analysis of the state of the **gas engine market**, by taking stock of what happened in 2017 and anticipating future trends and upcoming developments. Since **energy efficiency and clean emissions** are relevant topics today, we must take into consideration that if on one hand gas engines are helping to support this process towards reduced emissions and a greener world, – especially compared with **internal combustion engines** – it is evident that more could be done to enhance the high potential and efficiency of gas engines. **Routine maintenance**, for instance, is an essential ingredient of this good recipe.

As a main course, we have an insight on the **Food & Beverage Industry**, with a special attention paid to the implementation of management systems to effectively **track food records**, meeting the needs of F&B supplier companies, like Carolina Beverage, for document creation and workflow organization. Characterization of nanomaterials in complex food sample matrices is a current theme, in response to the **European Union definition of nanomaterials**, and some solutions for this purpose are presented. **Packaging** is a sub-insight of the Food & Beverage special, and presents a secondary and tertiary packaging line for a wide range of applications.

The side dish is the **Achema Preview** with an article written by Dr. Kathrin Rübberdt, Achema Communication, about electricity as a chemical resource. Thanks to the potential of the **Power-to-X** process, unused electricity for chemicals production and storage can be reconverted to energy. This will lead to a transformation of business models and value chains.

To satisfy even the most refined tastes, we have **Explosion Protection & Safety** for dessert. Safety can be a challenge in hazardous areas, like refineries, but with the right technology and know-how also the hardest challenges can become opportunities. And when Safety gets to Industry 4.0, the combination of **innovation and digitalization** results in increased productivity and employee's protection.

We drive the digestion with the **Motion & Control Technology** feature with an overview on Bonfiglioli Synchronous Reluctance Motor Technology, that offers the highest efficiency on the market or higher performances in a compact motor, depending on clients' needs.

Don't forget to visit PCN Europe **renewed website** and to read the newly designed **digital issue**, for a more mobile-friendly experience.

Sara Ibrahim

Editor of PCN Europe

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Pipeline Construction: A Virtual Process to Identify Wastes and Opportunities

Lloyd's Register. Pipeline construction is often like a moving manufacturing assembly line. However, rather than raw materials arriving at a plant and travelling through it in a closed environment, the materials are brought to a point and the construction process travels in a linear but open environment. Over the decades, there have been many improvements in manufacturing processes, probably the most notable being Henry Ford's moving assembly line and more recently, the concept of Lean Manufacturing, originally devised by Toyota. Pipeline construction can also evolve by adopting leaner practices. Can pipeline construction and manufacturing be compared? What can be done to reduce waste, and enhance visibility, accuracy, regulatory compliance and project efficiency?

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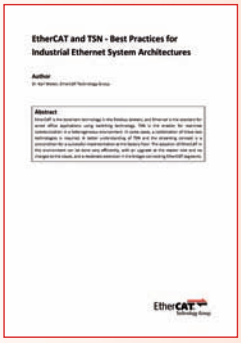
Best Practices for Industrial Ethernet System Architectures



EtherCAT Technology Group. EtherCAT is the dominant technology in the fieldbus domain, and Ethernet is the standard for wired office applications using switching technology. TSN is the enabler for real-time communication in a heterogeneous environment. In some cases, a combination of these two technologies is required. A better understanding of TSN and the streaming concept is a precondition for a successful implementation at the factory floor. The adoption of EtherCAT in this environment can be done very efficiently, with an upgrade at the master side and no changes to the slaves, and a moderate extension in the bridges connecting EtherCAT segments. This whitepaper explains how to use this up-and-coming technology in the context of industrial automation.

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New Exhibitors Record Expected at Anuga FoodTec 2018

More than packaging: Anuga FoodTec, the leading international supplier fair for the food and beverage industry, is opening its doors from 20 to 23 March 2018. Around 1,700 exhibitors are expected in the Cologne exhibition halls. "Anuga FoodTec will continue its success story. We are once again forecasting a +13 percent increase in the number of exhibitors compared to the previous event. As such, as the only trade fair worldwide, Anuga FoodTec covers all aspects of the food production and will convince in the coming year even more than ever due to its enormous variety of offers and quality," said Katharina C. Hamma, Chief Operating Officer of Koelnmesse GmbH. In line with the high demand on the exhibitor side, Anuga FoodTec is again increasing its exhibition space in 2018 up to 140,000 square metres (+8 percent) and is being staged in Halls 4.2, 5.2, 6 to 9, 10.1 and for the first time additionally in Hall 10.2. Anuga FoodTec is also presenting itself in good form in terms of its degree of internationality: Companies from more than 50 countries will be presenting their new products in Cologne.

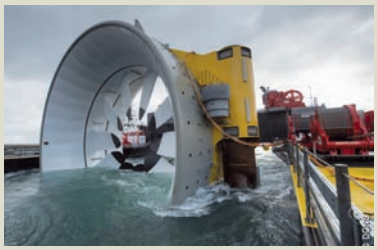
The Motion Control Industry Brought Together in Birmingham

Being held on Tuesday 10th April 2018, at the National Conference Centre near Birmingham, the Motion Control Industry Awards Dinner will once again bring together the entire motion control industry in a celebration of business and professional excellence. Recognising and rewarding the achievements of both individuals and companies operating within this important industry sector, personal endeavour, technical innovation, engineering advancement and commercial acumen will all be acknowledged and celebrated. Sponsored by some of the biggest names in the sector, including ABB, BCAS, Beaumanor Engineering BFPA, Bosch Rexroth, GAMBICA, Parker Hannifin and PI, the awards programme can again claim widespread support. Co-located with a suite of industrial exhibitions at the adjacent NEC, including Drives & Controls, Fluid Power Systems, Airtech, Smart Industry Expo and Plant & Asset Management, and building on the 200+ industry professionals who attended the 2nd event last year, the 2018 awards dinner looks set for further success.

2018
MOTION CONTROL
INDUSTRY AWARDS

The Powerhouse of a Global Tidal Energy Industry will be France

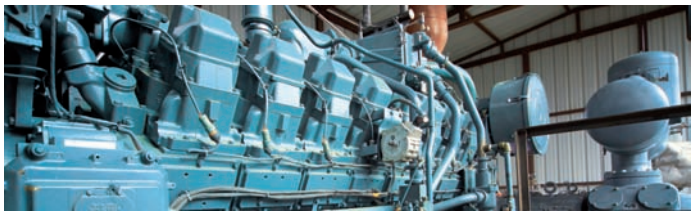
Secretary of State for the Ecological and Inclusive Transition, Sébastien Lecornu, announced preliminary studies to the launch of a tidal energy tender in Paris yesterday evening. The announcement is an important first step and strong message to the sector. A tender for tidal energy will see France become the global centre of tidal energy manufacturing. The tides in northern France are among the most powerful in the world. Following a decade of R&D development, tidal energy technology is now ready to use this resource. Tidal farms will generate predictable renewable energy, while creating significant jobs opportunities and local economic activity. Speaking at the Colloque Annuel of Syndicat des Énergies Renouvelables (SER) yesterday, Secretary of State for the Ecological and Inclusive Transition, Sébastien Lecornu, announced the launch in 2018 of preliminary studies of tidal zones in Brittany and Normandy. Rémi Gruet, CEO of Ocean Energy Europe, welcomed the announcement and called for the launch of a tender for tidal energy as soon as possible.



Invertek Strengthens its Presence in North America

Global variable frequency drives (VFD) innovator and manufacturer, Invertek Drives, has announced it is strengthening its presence in North America with a new US headquarters near Chicago. Recognised as one of the main global innovators in easy to use VFD technology, UK-based Invertek Drives has promoted its Global Sales Manager, Wayne Morris, to Vice President of Invertek Drives USA and recruited Pete Roberts as Sales Manager. They will be based at new offices and a distribution centre in Libertyville, Illinois from where they will work with existing US distributors and Sales Rep Groups, as well as expanding and developing the US network. "North America is a significant market for us outside Europe. We have a strong network of distributors throughout the Americas as a whole and the expansion of our team in North America will bring additional support and opportunities to them and their customers," said Rhydian Welson, Sales and Marketing Director at Invertek Drives.

The Gas Engine Scenario



Taking stock of the current market scenario becomes necessary to analyze what happened in 2017 and anticipate future trends, getting ready for 2018 developments

As we move towards year-end, I'd like to take stock of the current market scenario, while anticipating future trends.

LOOKING BACK AT 2017

The European Union has a number of initiatives to promote energy efficient operations as we strive for a greener world – and the industry is gradually responding. Gas engines, in particular, are helping to support this mission as a clean energy source with a wide range of applications that can help to reduce waste.

As a result, over the past twelve months, gas engine usage has experienced steady growth. This is largely down to the energy efficiencies that gas engines offer, particularly when compared to internal combustion engines.

After all, internal combustion engines remain incredibly inefficient at turning fuel into usable energy, averaging just 20% thermal efficiency. Gas engines, on the other hand, achieve approx. 40% and, in some cases, can reach up to 47%.

KEY TRENDS FOR 2018

I see two key trends emerging as we move into 2018: the rise of dual-fuel engines and changes in maintenance considerations. Dual-fuel engines present a number of advantages to operators for their ability to switch between fuels depending on demand. Typically, a dual-fuel engine will start using diesel and later add natural gas, which ignites quickly, thus helping to start the engine at a high efficiency rate. This adaptability helps optimize engine efficiency to suit specific operating conditions. When it comes to maintenance considerations, regular checks and care are always important to ensure optimal performance. However, when operating engines on new sources or varying power demands it is essential to monitor performance. Developing a routine maintenance schedule is therefore central to enhance the high potential and efficiency of gas engines.

Sara Ibrahim

The Digital Transformation Takes Off at HANNOVER MESSE

PCN Europe met Marc Siemering, Senior Vice President – Industry, Energy & Logistics at Deutsche Messe AG, who explained how the digital transformation changed the industrial world and triggered the Industry 4.0 revolution

PCN Europe: In 2018 there will be a change in the leading trade fair themes. For the first time, IAMD (Integrated Automation, Motion & Drives) will be launched, a combination of two topics, Industrial Automation and MDA (Motion, Drive & Automation). What was the trigger for that change?

Mr. Siemering: Industrie 4.0 erases borders between industries and shortens innovation cycles. Not only industrial companies have to react to these changes. HANNOVER MESSE also has to adapt to the new reality. Companies from the power transmission and fluid technology sectors have traditionally exhibited biennially at the show, but market demands have changed. In the digital age, companies bring products to market faster than ever and therefore want to display their innovations more often. An annual presentation at HANNOVER MESSE is the solution for these companies. Therefore, we combined Industrial Automation and Motion, Drive & Automation (MDA) to form IAMD–Integrated Automation, Motion & Drives. Of course, we still offer a home to the companies that want to exhibit every two years.

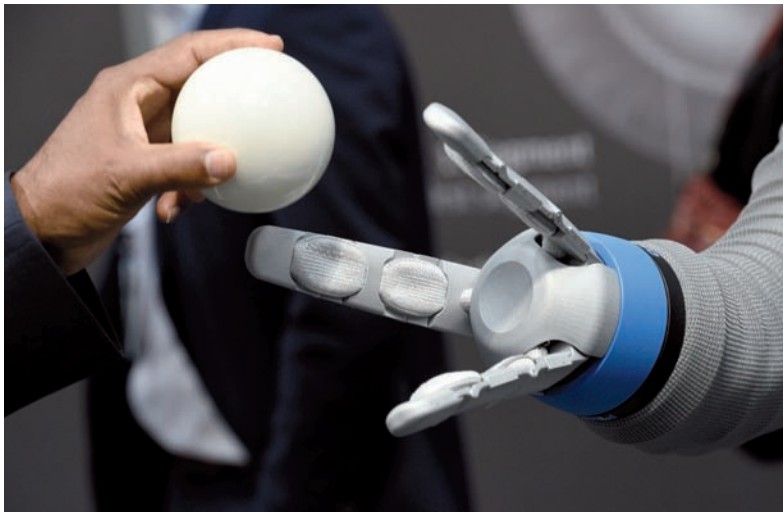
Marc Siemering, Senior Vice President - Industry, Energy & Logistics, Deutsche Messe AG

PCN Europe: Under the IAMD brand, the topic of digitization/industry 4.0 is to be communicated worldwide and made tangible. What has been the response so far?

Mr. Siemering: The market has responded positively. From a technological standpoint, Industrial Automation and MDA were already growing together during the past few years. The fusion follows the logic of a global market that both offers and demands more and more cross-industry and cross-system solutions and networked products. The new IAMD strengthens HANNOVER MESSE's position as the world's leading tradeshow for Industry 4.0. From components to data management in the Cloud, HANNOVER MESSE provides an overview of the complete solution and not just the separate parts. This strong brand and the key players behind it also give us more influence in the international exhibition market.

PCN Europe: On the website of the Hannover Fair you can find the announcement of more than 500 events in the IAMD environment. What spectrum of events can trade visitors expect?

Mr. Siemering: Every year we stage more than 80 conferences with more than 1,700 talks and



panels about a broad range of topics. Some examples related to IAMD are the Motion & Drives Forum in Hall 23, the special area Smart Power Transmission and Fluid Power Solutions, and the Industry 4.0 Forum. Participants in these events will learn about the next steps on the way to a smart factory.

PCN Europe: The topic Industry 4.0 has already reached a degree of maturity at the last Hannover Fair that a large number of marketable products have been exhibited. What figures and developments are you expecting this year?

Mr. Siemering: In 2018, for the first time we are staging HANNOVER MESSE together with CeMAT, the world's leading tradeshow for intralogistics and supply chain management. This brings a new dynamic to the show, further driving the digital transformation of industry through the interplay of automation and energy technology, intralogistics, IT platforms and artificial intelligence. Our lead theme "Integrated Industry - Connect & Collaborate" shows the potential of this development. HANNOVER MESSE is the pacesetter for Industry 4.0. Only in Hannover will you experience the rapid development of Industry 4.0 and its consequences. And only in Hannover can you see the digital transformation of industry presented as a complete system.

PCN Europe: Already during the last editions of the Hannover Messe, the topic of robotics, especially with regard to the aspect of human robot collaboration, aroused great interest among the visitors. These topics will of course also be in the spotlight at CeMAT. In your opinion, which visitors can benefit from this constellation?

Mr. Siemering: Robotics will play a big role in 2018, too. ABB, Epson, Kawasaki, Kuka, Mitsubishi, Schunk, Stäubli, Universal Robots, Franka Emika and Yaskawa – the list of companies signed up for HANNOVER MESSE 2018 reads like a "Who is Who" of the industry. Robotics companies, system integrators and providers of gripping technology demonstrate their solutions for smart factories and intelligent warehouses. It is no secret that robots and driverless transport systems have become indispensable in modern production facilities and automated warehouses. Robotics firms continue to set new standards for man-machine collaboration. Moreover, the trend that more and more small and medium-sized companies are discovering reasonably priced, flexible robotics solutions remains unbroken. At CeMAT, the startup Magazino from Munich will show its robotics competence with two robots: TORU picks cuboid objects in e-commerce shipping warehouses and is already in commercial use. SOTO works similar to TORU but can handle much larger and heavier objects such as small load carriers or boxes up to 15 kilograms. SOTO is currently in the prototype phase and will go into operation later in 2018.

PCN Europe: At the leading trade fair Digital Factory, the focus is on industrial software along the entire process chain in production. Is this a "little sister of CeBIT"? Where do you see similarities and differences?

Mr. Siemering: Digital Factory and CeBIT are two completely different events. As part of HANNOVER MESSE, Digital Factory serves the manufacturing industry. The exhibitors show IT and software solutions for virtual product development, production planning, process control, and predictive analyses as well as concepts that enable the secure distribution of data in the digital factory. CeBIT has a completely different, much broader scope: It provides a 360-degree view of digitalization in companies, government and society.

PCN Europe: The fair's partner country will be Mexico. The country's economic relations are strongly oriented towards its northern neighbour USA. Where do you see the greatest opportunities and points of contact for Europe and Germany?

Mr. Siemering: Mexico's relationship with the USA, until now its biggest trading partner, stands at a transition point. Right now, Mexico is very interested in growing trade with other countries as well as promoting structural change with the necessary infrastructure domestically. Mexico will use HANNOVER MESSE to present a range of innovative products, systems and industrial sectors as well as to expand its trade and economic relations with Germany. Germany is already Mexico's most important trading partner in Europe and fifth most important worldwide. Furthermore, Germany is the fourth biggest European investor in Mexico and sixth biggest worldwide.

PCN Europe: Thank you for this interview Mr. Siemering!

Kay Petermann

Deutsche Messe
▶▶ 54676 at www.pcne.eu

Tracking Food Safety Records

The co-packing producer expert in the beverage manufacturing industry, Carolina Beverage, decided to implement EtQ Reliance™ Quality Management System to effectively manage and track food safety records

The co-packing producer Carolina Beverage targets customers in the beverage industry with specialty-size packages that need strategic production on the East Coast. Carolina Beverage has the capability to produce a variety of package sizes including 8.4oz, 12oz, 16oz, 24oz Cap Can, and 32oz cans, as well as various glass and PET bottle shapes. In the Food and Beverage industry there is a growing demand to implement automated systems to manage and track food safety records. Carolina Beverage recognized this need and sought to enhance their method of managing documents within their organization. This led to a need for an enterprise document management process.

FILLING THE GAP

Carolina Beverage had two specific criteria in mind when looking for a software vendor to meet their need: The software had to be user friendly and a comprehensive solution for all document management processes. EtQ met both of these requirements exactly by offering web-based a solution that is intuitive, flexible, and is able to support multiple document types across multiple workflows.

In particular, they liked EtQ's capability to be maintained by business users, which enabled them to save IT resources and implement the software in a way that is most effective for matching their company's unique business processes. In addition, Carolina Beverage was able to leverage EtQ's intuitive user interface to train users on creating documents and workflows within the system. This ability helped flatten the learning curve for their users and speed up the training process.

EtQ also stood out as the premier solution at Carolina Beverage through reputation; individuals within the company had previously worked with EtQ and touted a positive experience. With all these considerations in mind, Carolina Beverage chose to implement EtQ Reliance™ Quality Management System (QMS).

REAPING THE BENEFITS

EtQ Reliance™ was seamlessly implemented at Carolina Beverage and they were pleased with the end result. They consider EtQ to be "easy to maintain and interface with." Since implementing EtQ Reliance™, Carolina Beverage's initial challenges have been effectively addressed. They now have almost all Standard Operating Procedures (SOPs) housed within the EtQ system and have removed all uncontrolled copies from their file server. EtQ's Document Control system uses specific workflows, escalation rules, email alerts, and links to training, which help to efficiently manage all controlled documents. Furthermore, EtQ's workflow-enabled change request process allows Carolina Beverage to track and manage revisions to new documents as well as to archive obsolete documents. Carolina Beverage has been pleased with their investment in EtQ Reliance™ and has been able to see positive returns in meeting their overall objectives thus far. The company continues to reap the benefits of EtQ's solution and seeks to expand their use in the future.

LOOKING FORWARD

Carolina Beverage plans to build a Quality system that is compliant with one of the GFSI standards in order to ensure continuous, high quality products for their customers. They will leverage EtQ in this process to ensure compliance with the GFSI food safety standards. EtQ's ability to automate processes, streamline employee training, and provide overall ease of use in a Document Control system has resulted in a solution that will grow with Carolina Beverage and continue to help nurture their business processes. EtQ's Quality Management System has provided them with the tools needed for document management within their organization as well as with the ability to ensure compliance to applicable regulations, which will help in future implementations.

EtQ

54678 at www.pcne.eu

DISTANCE COUPLING

For connection of far distant shafts

Enemac offers a new product line, the distance coupling EWLC. Even in difficult areas, such as medicine, pharma, food and beverage technology, long distant shafts have to be connected often. Distance couplings have been created in order to avoid complex and cost-intensive design work for necessary intermediate bearing arrangements. The distance coupling EWLC, with an overall length of up to 3 m, has a length-variable intermediate pipe made of stainless steel A2 or A4, which is adapted according to customers requirements. This pipe is connected with two metal bellows couplings made of stainless steel A4. In many cases, the EWLC distance coupling can be used as a play-free connection, power train or synchronous shaft. Misalignments can be compensated with this type in a considerable range.

▶▶ 54710 at www.pcne.eu

UNIQUE MIXPROOF VALVE

For product safety equipment lifetime

Corrosion challenges are often demanding for manufacturers of products containing high chloride concentration or low pH-levels. Meeting the demand for higher corrosion resistance, **Alfa Laval**'s newly launched high alloy versions of its well-known Unique Mixproof valve secure superior product safety and longer equipment lifetime. The new Alfa Laval Unique Mixproof High Alloy version comes in two optional materials: Hastelloy C22 and AL6XN. The new Alfa Laval Unique Mixproof High Alloy, manufactured in either Hastelloy C22 or AL6XN, provides two solutions for higher corrosion resistance, longer equipment life and reduced production downtime. The UltraPure version of Alfa Laval Unique Mixproof valve was launched to meet the high standards needed in the growing pharmaceutical industry.

▶▶ 54241 at www.pcne.eu

VACUUM TECHNOLOGY

For increased efficiency

Leybold released its vacuum technologies for the food processing and packaging industry. The efficient solutions of the vacuum supplier are used worldwide. At one of Italy's largest producers of meat products near Parma, the installation of a Leybold system has reduced packaging time by around 20 percent. In addition to high vacuum performance, the meat product specialist attaches particular importance to an energy-efficient production process with low service and maintenance costs. The system based on the DRYVAC dry screw pump has been running reliably and without interruption for years, so that the customer was able to devote himself to the core tasks. Leybold's modern vacuum technology such as the CLAWAC offers special product properties especially in the rough vacuum range.

▶▶ 54711 at www.pcne.eu

VALVE ISLAND

Designed for optimal compatibility

Until recently, the pneumatic control valves within the valve island have had very little diagnostic ability, which could make fault-finding quite time consuming. However, this has now changed with the introduction of the Type 8647 AirLINE SP valve island from Bürkert. With a direct internal connection, all of the valves in the **Bürkert** island can now be seen as digital outputs on the Siemens operating system. An integrated liquid crystal display also shows pilot valve status, switching status of the process valve, current pressure values, switching cycle counter as well as a diagnostic report. This makes commissioning and maintenance much simpler, providing fast and permanent fault diagnosis. The AirLINE SP also uses ring networking topology and a media redundancy protocol (MRP) to ensure continued operation of the system in the event that a communication node fails.

▶▶ 54712 at www.pcne.eu

An All-in-one Outside the Box Approach

Benny Magrafta, Head of Unitronics R&D Software Department, explains how Unitronics, founded as a young and creative start-up in 1989, has soon enough become an international all-in-one PCL+HMI manufacturer, distributed to over 50 countries an recognized as a reputed innovation company in the industrial automation field

PCN Europe: Unitronics is a name that is gaining considerable industry recognition. How old is the company? What were the first products and how did it develop?

Mr. Magrafta: I joined Unitronics the same year the company was founded, in 1989. Our original goal was to execute turn-key automation projects using PLCs manufactured in-house. Each project has its requirements - and its problems. We were a young, creative startup, and so we believed in the 'think outside the box' approach. This creativity is embedded in the company's DNA. It is why Unitronics has developed award-winning products in the realms of both hardware and software, and why we have a reputation as innovators in the field of industrial automation.

I am proud to be a part of Unitronics - today, our controllers are marketed via a global distribution network of over 160 distributors in over 50 countries. Our Logistics Solutions division serves well-known companies such as Teva pharmaceuticals, and our new, "green" sector: automated parking technology, served by Unitronics' award-winning Parking Solutions division.

Benny Magrafta, Head of Unitronics' R&D Software Department

PCN Europe: Judging by appearance alone, Unitronics products do not seem to be typical PLCs. Your new UniStream 5" is a good example. What is the concept behind this?

Mr. Magrafta: True - our controllers are not typical in appearance, and this is the story behind it: In those early years, an HMI was a few buttons and maybe a single-line text display. It was clear to us that the HMI was the window into the soul of the application, the absolutely best way to improve operational efficiency. And so we created what we called the "OPLC" (Operator Panel + Programmable Logic Controller).

Today, we call them All-in-One PLC + HMI controllers. As far as I know, Unitronics was the very first company to create and manufacture such programmable controllers. Our products are based on this concept, and so they do not 'look' like typical PLCs – the front contains the HMI panel, the rear the PLC, and our controllers generally offer either built-in or snap-on I/Os. Today, common HMIs are color, resistive touch-screens. Our new UniStream 5", like most Unitronics controllers, is a single, convenient, integrated device that you install to serve as both operating panel and PLC, which means reduced wiring, and eliminates the hassle of programming to establish PLC-to-Panel communications.

PCN Europe: How does the UniStream 5" appear in terms of functionality?

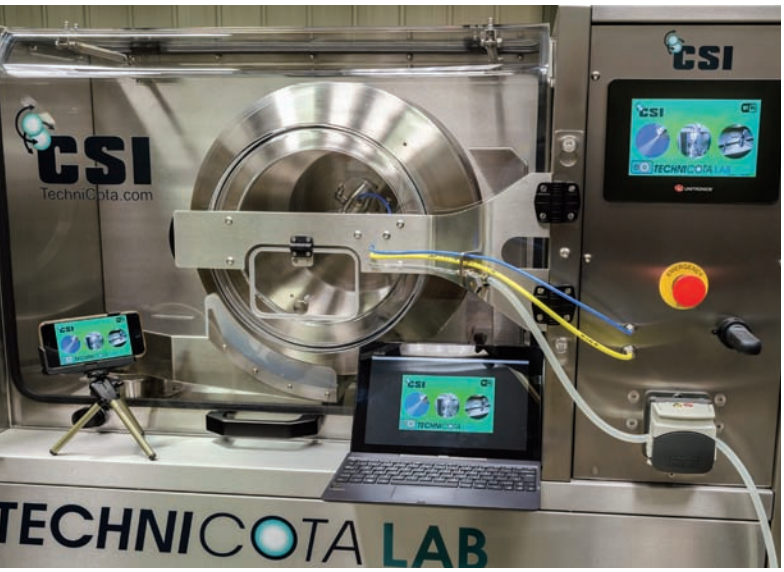
Mr. Magrafta: UniStream 5" is a member of our UniStream series – powerful PLCs and HMIs, embedded with multi-processors and multi-

O/S (LINUX & RTOS). They differ in HMI screen size, 15.6", 10.4", 7" and now 5" – but all offer a rich range of built-in functionality. Let's look, for example, at our set of advanced Data Tools. The Data Sampler records dynamic application data, say, tracking multiple temperature values, which UniStream regulates via embedded, auto-tuned PID. You can display the running values on the HMI screen using Trend – or Gauge – widgets. You can easily log those values into Data Tables, where you can organize and manipulate data via Ladder, or let the user do it via HMI. The PLC can export them to Excel, attach them to an email and send it – or export the values into Data Recipes, to control dynamic, complex production processes.

Did I say HMI? You can do the same via your web browser – UniStream includes an embedded Web Server. Or, use your favourite VNC app to view and operate the HMI program remotely. Or take Alarms, easily configurable, multi-level Alarm displays that are compliant with the ISA standard, ANSI/ISA-18.2-2009, or UAC – multi-level User Access Control – that prevents unauthorized access.

PCN Europe: What industrial sectors do your products serve? How about special requirements, e.g. for robustness under environmental conditions?

Mr. Magrafta: Our controllers target a broad range of sectors: water technologies, pumps, oil & gas, power and energy, packaging, F&B – they have even been integrated into Data Centers. Many of our products are certified for hazardous environment standards, CFR-21.11, and F&B spray-and-wipe industry standards.



"We have found Unitronics to be one of those companies which inspire you to push the boundaries". David Graham, Coating Systems International. Pharmaceutical Industry

PCN Europe: Industry 4.0 is an important issue, growing in importance every day. Which functionalities are built into your product range to support your customers in the age of 4.0?

Mr. Magrafta: UniStream supports Industry 4.0 via its advanced communication features. Since the controller supports SQL Client, it can communicate via existing Ethernet infrastructure to interface with factory ERP/MRP servers. You can run tag, struct, array, and complete table queries. You can also access your controller via VNC – or web browser – and control it from a remote location. Ethernet interfaces and TCP/IP support also provide access to the PLC for file transfers (FTP) and email support, so that the PLC can send messages directly to personnel. SNMP support enables you to integrate UniStream into the IT infrastructure and manage it as an IT asset. We have more features under development: This is a major focus of our activity!

Unitronics

▶▶ 54684 at www.pcne.eu

Characterisation of Nanomaterials in Food

The advanced Multiflow Field Flow Fractionation system for separation of proteins, macromolecules and nanoparticles, engineered by Postnova Analytics, was used by the inorganic analysis team within LGC UK to characterize nanomaterials

Fulfilling the characterization of nanomaterials in complex food sample matrices was possible at LGC (Teddington, UK) thanks to the use of the AF2000 Field Flow Fractionation platform from Postnova Analytics, coupled to Inductively Coupled Plasma Mass Spectrometry.

HOW NANOMATERIALS ARE USED IN FOOD

Nanomaterials are known to be present in over 1300 food and commercial products. As a result of the European Union (EU) recently providing a precise definition of a nanomaterial for regulatory purposes, it has become important to be able to characterize nanomaterials reliably to understand their behavior in contact with humans and the environment.

LGC is an international life sciences measurement and testing company with a history stretching back 175 years, providing reference materials, genomics solutions and analytical testing products and services. It is home to several national government roles, including the UK National Measurement Laboratory, the Designated Institute for Chemical and Bio-measurement and the Government Chemist.

CONCENTRATION ANALYSIS OF NANOMATERIALS

The inorganic analysis team at LGC - led by Principal Scientist and Science Fellow, Dr Heidi Goenaga-Infante - has established world class expertise in size-based and number concentration analysis of nanomaterials using hyphenated techniques to support the development of reference methods and materials, with field flow fractionation coupled to ICP-MS (FFF-ICP-MS) being the centrepiece of their multi-modal analytical approach.

Dr Goenaga-Infante commented "Over the last 15 years, Field Flow Fractionation (FFF) coupled to ICP-MS and other sizing detectors has proven itself a powerful tool for the characterization of nanomaterials. For complex samples FFF seemed the ideal choice for matrix separation/sample fractionation, enabling us to achieve selective detection and characterization of nanomaterials, that otherwise would have been hampered by the matrix components".

Dr Goenaga-Infante added "Having decided that FFF was the technique for us, we approached the two leading FFF manufacturers. We selected Postnova Analytics as our vendor of choice on the basis of their fast response to queries, scientific credibility and knowledgeable technical research assistance. The Postnova AF2000 system works robustly online when coupled with ICP-MS if a systematic approach is undertaken. We very much look forward to extending this collaboration into a partnership for life."

FLOW FIELD-FLOW FRACTIONATION (FFF) PLATFORM AF2000

The Postnova AF2000 is a high-performance Flow Field-Flow Fractionation (FFF) platform for separation of nanoparticles, macromolecules and proteins in complex matrices such as foodstuffs. Modular in design, the AF2000 incorporates the combined experience, expertise and technological advances from Postnova Analytics' two decades of leadership in FFF. Incorporating a range of FFF modules in a single integrated system to provide universal separation, the AF2000 offers more flexibility, better performance and more robust results than any system before.

Postnova Analytics

▶▶ 54702 at www.pcne.eu

GRIP CHAINS

For precision feeding, transport and positioning

Grip chains from **iwis** have wear- and corrosion-resistant clamping elements that ensure safe and reliable feeding, transport and positioning of thin-walled materials with a large surface area. Grip chains are used, for example, in packaging, medical technology, electronics, PCB production and metalworking industry applications. For use in food processing, all chains are available with food-grade lubrication. The clamping elements allow the chain to grip and hold thin-walled materials with large surface area, such as films. Different levels of spring force allow a wide range of materials to be gently gripped and securely held.

▶▶ 54713 at www.pcne.eu

O-RING SEALS

Provide long term operation under arduous conditions

The deformation of metal seals can be reduced or even virtually eliminated by utilising the DuPont Kalrez perfluoroelastomer (FFKM) O-ring seals. The Kalrez® O-ring seals are available in the UK from authorised distributor **Dichtomatik** Ltd. Finished O-rings, custom shapes, sheet and cords are manufactured exclusively by DuPont from raw material right through to the finished products, and Kalrez is now the choice of elastomer for demanding sealing applications. Kalrez perfluoroelastomer is resistant to over 1800 different chemicals while offering the temperature stability of PTFE (327°C).

▶▶ 54714 at www.pcne.eu

FOOD GRADE ROBOTS

To meet a wide range of applications

The new Motoman GP7 and GP8 food grade robots from **Yaskawa** are a good example of the drive to apply the benefits of increasingly sophisticated automated handling and robotics solutions to the widest possible range of applications, including the food industry. The GP7 and GP8 robots are designed to meet the specific requirements of food, beverage and other 'hygienic' processing applications by offering a number of important features. For example, all moving parts use food grade grease and they are finished with a white, water based paint colour for food related applications. Robot speed, acceleration and deceleration reaches the same standards as with standard grease while the drip-proof outer design and finish ensures a smooth disposal of a liquid on the robot surface. In addition to the food industry application features, the GP7 and GP8 options also offer the other benefits associated with Motoman robots, such as, optimum productivity with high payloads and speeds. They allow for a wide variety of products to be transferred with different grippers which can be mounted with 7kg and 8kg payloads providing 38% greater allowable movement.

▶▶ 54715 at www.pcne.eu

From Tableting Technology to Final Packaging

Romaco presented its Promatic secondary and tertiary packaging line for a wide range of applications, especially in the pharmaceutical, cosmetics and food industries as well as the KTP 420X rotary press from Romaco Kilian

At the last Pharmtech exhibition in Moscow, Romaco showed its BIPAK vertical cartoner in line with the PAK 130 case packer in the semi-automatic standard model. With this version, the products are fed manually to the Promatic BIPAK and positioned in the open cartons from above by the machine operator. The feeding conveyor provides sufficient space for four persons and can be extended as required. This user friendly cartoner is ideal for the secondary packaging of upright products such as bottles or jars as well as for inserts like spoons, pipettes or booklets. The operator can switch the machine between continuous and intermittent motion, depending on the application. A simple setting on the HMI suffices. All in all, the Promatic BIPAK is a very versatile system: the basic machine is delivered with all the tools that are required to process the complete product range of the cartoner. At the customer's request, the machine can also be configured with a pick & place system, which feeds the products automatically. The Promatic BIPAK achieves a maximum output of 120 cartons a minute. Reliable processes and long servicing intervals are further hallmarks of this vertical cartoner.

The in-line Promatic PAK 130 case packer, which packs the folding cartons into shipping cases, is semi-automatic too. This machine groups, stacks and inserts the cartons fully automatically. The only manual steps are case erection, feeding and removal again after filling. An output of up to five shipping cases per minute is possible with the PAK 130, depending on the dimensions of the packaging. A system for closing the carton flap with adhesive tape can be installed as an option. The case packer has a compact, ergonomic design and is easy to set-up and clean after product changeovers. What's more, the technology is altogether affordable to purchase and inexpensive to maintain. The Promatic PAK 130 is hence the perfect final packaging solution for numerous line configurations.

ROMACO KILIAN: "COOL, FAST & CLEAN" TABLETING TECHNOLOGY

With its modern design principles, the KTP 420X rotary press from Romaco Kilian is meanwhile firmly established in the market. "Cool" sums up all measures that keep the temperature in the process area at a constant level below 30°C, which is particularly ideal for processing temperature sensitive medications such as Ibuprofen or Metformin. "Fast" stands for the optimised retooling and cleaning times of the rotary press. With a maximum output of 360,000 tablets per hour, the Kilian KTP 420X can be unequivocally described as a high speed press for pharmaceutical applications. "Clean" refers to the hygienic design, which improves product quality and process reliability. The strict separation between the compaction, retooling and service areas prevents tablet dust from entering the machine compartment. The patented punch bellows protect the tablets from contamination with lubricants. The excellent OEE (overall equipment effectiveness) and TCO (total cost of ownership) values are key characteristics of Romaco Kilian's KTP 420X. The integrated HMI terminal featuring swipe navigation inspired by modern smartphones turns operating the rotary press into child's play.

The Romaco Group

▶▶ 54709 at www.pcne.eu

13TH INTERNATIONAL CONFERENCE AND EXHIBITION ON EMISSIONS MONITORING

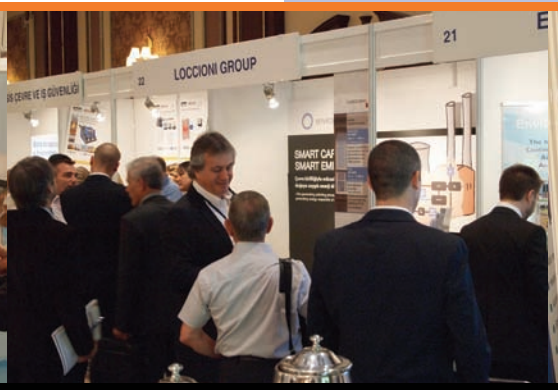
Are you responsible for emissions monitoring in your plant?

The international emissions monitoring community will come to the historic city of Budapest to network, trade ideas and discuss technology, methods, applications, legislation and standardisation relevant to all atmospheric pollutants which include particulates, SO_2, NO_x VOC, trace elements and greenhouse gases.

CEM 2018 will be ideal for delegates to attend from the Cement, Power, Petrochemical, Waste, Metals and Process Industries. Delegates will be able to network with regulators, fellow CEM users, manufacturers and suppliers of CEMs equipment and services.

CEM 2018 Conference Topics:

1. Emission Trading
2. Maritime Directives
3. Fugitive Emission
4. Fine Particulate Monitoring
5. Mercury
6. Standards and Quality
7. Predictive Emission Monitor Systems (PEMS)
8. Case Studies (Power industry, Cement industry, Steel industry, Chemical Industry, Glass industry)



www.cem.uk.com

Electricity as a (Chemical) Resource?

The Power-to-X process seems to be a valuable alternative to renewable energies for green energy supply and storage. The idea behind it is to reconvert to energy unused electricity for chemicals production that can be stored without significant loss

Author: Dr. Kathrin Rübberdt, ACHEMA Communications

"New records in renewable electricity generation"– "Wind and solar yesterday covered lion's share of energy demand" – media and the internet are not short of success messages on renewable energy generation in Germany. But this apparent good news has a downside, too: With an increasing share of renewable energy, especially wind and solar power, the volatility of energy generation increases. Peaks in energy supply are so high that up to 5 billion kWh of renewable electricity have to be cut off per year because the grid cannot accommodate it. At the same time, the nation struggles with meeting its climate goals due to the ongoing emissions from coal power plants that are needed in order to ensure the energy supply on windless nights. Thus, while on 1 January 2018, according to "Agora Energiewende" more than 95 % of the electricity in the German grid came from renewable sources, on 24 January 2017 more than 90% of energy demand had to be covered by conventional power plants, according to BDEW.

GUARANTEEING 24/7 ENERGY SUPPLY

So far, this "conventional reserve" is the only way to secure a 24/7 energy supply all year round. Expanding the renewable generation capacities with a geographic spread so that always somewhere the wind is moving a windmill or the sun is shining on a photovoltaic plant takes a long time and leads to increasing overproduction on windy and sunny days.

The existing storage capacities such as pumping plants and reservoirs are limited and in Germany almost exhausted. Battery technology is being pushed, but scalability is restricted and the consumer uptake of electric mobility is slow. Moreover, in order to level out summer/winter fluctuation in renewable energy generation, long-term storage is required.

POTENTIAL ALTERNATIVES: POWER-TO-X

Therefore, researchers and industry are looking for alternatives. "Power-to-X" is one of the hot topics of the day – a vision moving towards application. The basic idea: Unused electricity is used to produce chemicals that can be stored without significant loss and can either be reconverted to energy or used as a basic resource for the chemical industry. This is more than just a technological innovation – it will change businesses and value chains fundamentally. As sectors such as electricity, gas, mobility and the chemical industry become more integrated, new cooperations are essential.

The "traditional" conversion path of electricity to energy-rich substances is the electrolysis of water. Hydrogen has multiple potential uses, making it a flexible and versatile energy store, especially as it can – at least to a certain limit – be coupled with existing gas infrastructures. So far, however, the technology is not competitive. Projects such as HYPOS – Hydrogen Power Storage & Solutions East Germany e.V. are taking up the challenge to find the most cost-efficient pathway and create a showcase by combining technological innovations and existing networks and infrastructure.

Current "Power-to-X" concepts take the approach one step further: They use renewable electricity to produce not only hydrogen, but

by drawing on CO_2 as an additional readily available resource, they synthesize methanol or more complex molecules such as synthetic fuels. This could provide the opportunity to kill two birds with one stone: By producing carbon-neutral fuels, greenhouse gas emissions from the mobility sector could be drastically reduced long before the onset of the era of electric mobility.

GREAT CHALLENGE

What sounds so easy in theory, however, poses big technological challenges: The conversion of CO_2 requires a lot of energy and/or highly sophisticated catalysts. Technology development is going at full blast: The Federal Ministry for Research and Education has launched the funding program "Kopernikus". It is divided into four topics: New grid structures and systems integration addresses questions of infrastructure and its interlinking. A project on industrial processes focuses on "demand side management", meaning possibilities to adjust production processes based on available electricity. And in "Power to X", 64 project partners from industry and research organizations are looking for the most effective solutions: Does the transformation of water and CO_2 via (co-) electrolysis to hydrogen or synthesis gas – platform chemicals with a plethora of uses – pay off? Should hydrocarbons or oxo-compounds for mobility or chemicals such as long-chain alcohols for the chemical industry be the goal?

In the course of Kopernikus P2X, coordinated by DECHEMA, RWTH Aachen and Forschungszentrum Jülich, a range of technical solutions will be developed, and different pathways will be evaluated. If these technologies become successful – and experts certainly expect this to happen – an unexpected challenge might arise: So far, CO_2 conversion technologies depend on punctual sources. One day, if CO_2 conversion is a standard addition to any CO_2 emitting plant, CO_2 might actually become a scarce resource. The Swiss company Climeworks is setting forth to address this problem: They have developed a technology to capture CO_2 from air and are aiming at capturing 1% of global CO_2 emissions from the air by 2025, says Dr. Jan Wurzbacher, Managing Director.

But is the success of Power to X technologies up to engineers and scientists alone? No, say experts almost unequivocally. Dr. Ralph-Uwe Dietrich, Deutsches Zentrum für Luft- und Raumfahrt e.V., warns: "Without strong political authority the market introduction of power-to-X will not start." And Dr. Max Peiffer, Assmann Peiffer Attorneys, adds: "The current energy legislation does not provide a proper framework for Power-to-X-systems. The legislator needs to implement changes."

Dechema

▶▶ 54701 at www.pcne.eu

ACHEMA CONGRESS SESSIONS

Visit the ACHEMA congress sessions "Future energy supply" and "Electricity as a resource" to learn more about technical solutions. The plenary lecture "Sustainable Chemical Value Chains: New Perspectives for Sector Coupling" on Wednesday, 13 June 2018, by Walter Leitner, Max Planck Institut für chemische Energiekonversion, Mülheim/D and RWTH Aachen/D, and Markus Steilemann, Covestro AG, Leverkusen/D, will show how partnerships between industry and science can promote this development.

Safety as a Challenge

The turnaround carried out by the oil and gas company OMV in its Schwechat (Austria) refinery implied security measures to be observed. Thanks to Hima safety planning and know-how, OMV was able to start up production again on schedule, after intensive inspections and repairs

The international oil and gas company OMV carried out a turnaround of the entire petrochemical area of the refinery in Schwechat (Austria) in April 2017. In slightly less than seven weeks, the plant and its systems were shut down, dismantled, cleaned and inspected, defective parts were replaced, and everything was put back together. That was a monumental task. 4 process ovens, 71 fractionating columns, 508 heat exchangers, 698 tanks, 4,188 fittings and 1,485 safety valves were inspected, and repairs were carried out on approximately 12 kilometres of piping. Some 220,000 screws and bolts were replaced during the turnaround of the systems at the Schwechat refinery.

CHALLENGING SERVICE WITH STRINGENT SAFETY REQUIREMENTS

A turnaround of this size, involving the shutdown and restart of a highly complex petrochemical plant, can only be managed successfully with the safety expertise of specialists. As part of the intercompany project team composed of specialists from OMV and about 50 partner firms, 18 experts from HIMA were deployed on site.

Along with ensuring the safety of the plant system, the main challenge for the functional safety specialists was the large number of safety systems to be checked. A total of 61 HIMA safety controllers underwent a thorough general inspection and upgrade. In the ethylene cracker alone, 26 system cabinets were checked down to the last detail. For five weeks, HIMA engineers were busy with thorough inspection and upgrading of all existing HIMA safety controllers in various subsystems of the refinery. The safety controllers were also adapted and extended in line with the recently performed hazard and operability (HAZOP) study, so they could continue to ensure the availability and functional safety of petrochemical production.

Petrochemical production at the OMV refinery in Schwechat (Austria) resumed right on schedule after intensive inspection and repairs

SERVICE AHEAD OF SCHEDULE

HIMA started detailed planning one year before the turnaround. Within the tight time frame, all safety systems had to be checked and, in some cases, modified, and be fully functional again at the end. Thanks to precise scheduling and high personal commitment, the HIMA engineers were able to complete the required work even faster than planned. In this way they contributed to the successful turnaround of the petrochemical systems in the Schwechat refinery. Seven weeks after the start of the shutdown, OMV was able to start up production again, safely and on schedule.

QUOTE BOX

"HIMA was a competent and reliable service partner for the 2017 turnaround", says Fabio Lodigiani, Head of Safety Services at HIMA. "The functional safety provided by the HIMA safety controllers is essential for OMV. The technology of our petrochemical facility in Schwechat is very sophisticated. That makes this sort of turnaround a really challenging task, especially for our external partners who have to completely understand our situation and coordinate with each other. The on-time and professional implementation of the service and upgrade measures by the HIMA team contributed to the overall success of the project."

BACKGROUND: OMV TURNAROUND 2017

The fuels area of the OMV refinery in Schwechat was inspected in an earlier turnaround

During a turnaround period of slightly less than seven weeks, the systems were shut down, dismantled, cleaned and inspected, defective parts were replaced, and everything was put back together

in 2016. The petrochemical area – which accounts for about half of the refinery's systems and makes feedstocks for plastics production – followed in April 2017. This shutdown – a routine general inspection – is legally prescribed and is carried out every six years together with TÜV Austria. The project was preceded by two years of planning. Precise planning and intensive teamwork are required to successfully carry out such a complex turnaround and minimise the scheduled downtime.

Some 700 employees of the Schwechat refinery, together with an additional 3,500 service technicians from 50 partner firms in Austria and the rest of Europe, including HIMA, collectively performed around 820,000 hours of work. The project was also an enormous logistical challenge, requiring the creation of 1,500 additional parking places and the provision of meals for more than 4,000 people.

TECHNICAL DETAILS

Complete inspection of the safety controllers

As part of the 2017 turnaround, HIMA carried out a thorough inspection and upgrade of a total of 61 safety controllers installed in the Schwechat refinery:

- 42 Planar F system cabinets
- 14 Planar 4 system cabinets
- 4 HIQuad systems
- 1 HIMatrix system

In the ethylene cracker alone, there are 26 HIMA safety controllers that were inspected:

- 16 Planar F system cabinets
- 9 Planar 4 system cabinets
- 1 HIMatrix system

A turnaround of this size, involving the shutdown and restart of a highly complex petrochemical plant, can only be managed successfully with the safety expertise of specialists

HIMA SERVICE AND SOLUTIONS ENSURE HIGH SAFETY AND AVAILABILITY

The primary goal is to effectively protect people, systems and the environment. HIMA's service and the deployed safety controllers ensure safe system operation.

- **Expertise:** HIMA's service specialists know the customer's needs and the specific requirements of the systems. Service and upgrade tasks are also carried out reliably in overall project teams.
- **Service ahead of schedule:** Thanks to good planning, HIMA was able to complete the inspection of all safety controllers ahead of schedule, despite the complexity of the project. Compliance with planned downtimes increases cost-effectiveness.
- **Preventive safety management:** HIMA service focuses on the overall safety concept of the system. Shutdowns are utilised to efficiently keep safety technology up to date and make it fit for the future.
- **Long-term availability:** HIMA maintenance and service ensure long-term availably, even with legacy safety solutions such as Planar F.
- **Maximum safety:** The TÜV and SIL 3 certified HIMax and HIMatrix safety controllers, along with the SIL 4 certified Planar 4 controllers, ensure high system availability and safety.
- **Future-proof:** HIMA controllers fulfil all requirements for functional safety in the process industry (IEC 62443 and IEC 61511) and provide effective protection against the growing threat of cyber attacks.

HIMA Paul Hildebrandt

▶▶ 54705 at www.pcne.eu

Data is the New Gold for Industry 4.0

Safety technology not only protects employees from injuries, but it can also contribute to predictive maintenance and increased productivity. For this reason, it must offer a higher level of diagnostic information

Author: Christian Heller, Head of Product Management, Schmersal Group

Data is the new gold in Industry 4.0 / Industrial Internet of Things. Machines, tools and workpieces will become cyber-physical systems which collect and exchange data. The result is a whole new quality of production data which enables decentralised production control in real-time.

The future looks very promising: intelligent workpieces, machines and transport systems should be able to make autonomous "decisions" as to whether a subsequent production stage should be delayed or if another welding robot should take over in the event that one fails, for example.

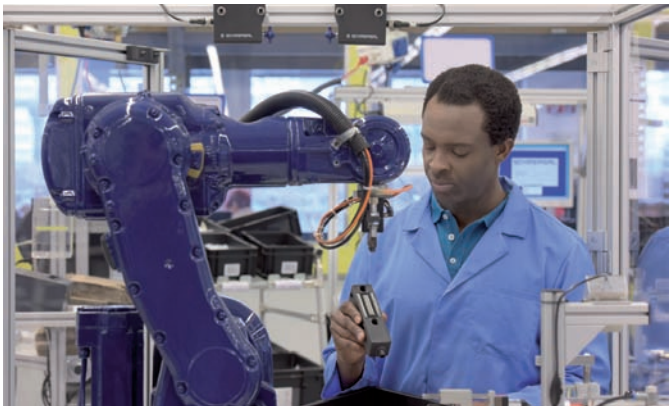
Converting production systems or machines to manufacture different product variants should also be possible on an automated basis in Industry 4.0. This enables companies a cost-effective production of customer-specific products in very small batch sizes. As a consequence, safety technology also has to be more flexible, individual and cost-effective in future. It also needs to offer a higher level of diagnostic information to allow companies to, for example, increase productivity and enable predictive maintenance and thus improve plant availability. And especially with the new, independent production systems, safety technology must, above all else, protect employees from injuries.

There are various modules which can be used to expand the PSC1 safety controller, e.g. with additional inputs and outputs, universal fieldbus interface, safe cross-communication and safe drive monitoring

The multifunctional safety relay modules in the Protect SRB-E range are a cost-effective solution

The new, modular safety controllers in the PSC product range from Schmersal offer the option of programming individual safety systems

The Schmersal safety installation systems: PDM passive distributor module, PFB passive field box and SRB-E active input extensions (from left to right)



Direct cooperation between humans and robots without separating safety fence will become more common with Industry 4.0

FOCUS ON SAFETY

For the safe signal evaluation, safety technology provider Schmersal provides solutions based on safety relay modules and safety controllers with a wide range of visualisation and diagnostic options depending on the level of complexity and connection depth of the safety circuits.

For smaller machines, for example, with one safety door plus emergency stop function, the safety relay module is the most cost-effective solution. The multifunctional relay modules in the Protect SRB-E range perform equally well in a wide range of applications. Each module has multiple functions, so the customer can simply select the application or function they require. No programming experience or software tools are required. The Protect Select safety controller is suitable for more complex safety-related functions. It has simple menu navigation through the clear text display which allows adaptation to the individual application. The user can select from four application programs which are predefined for the most common configurations of safety areas and cover around 80 percent of all applications. This should reduce the configuration required to a minimum without compromising on flexibility. For each program, the user has the option of simply activating functions such as the free allocation of feedback circuits (EDM), startup testing, cyclical testing, autostart, etc. Fast-moving sales markets demand cost-effective production of customer-specific products in very small batch sizes. In order to be able to produce smaller batch sizes, modular plants will play a more important role in future. Control functions are distributed across smaller, decentralised units which are networked to one another. Here, the new, modular safety controllers in the PSC product range from Schmersal offer the option of programming individual safety systems. Safe cross-communication is also possible across different PSC controllers thanks to Ethernet Safety Device to Device Communication (SDDC). This simplifies the design of complex, multi-part plants with interconnected safety sub-systems. With the integrated universal communication interface the user can simply select and configure various fieldbus protocols by using the software. The standard bus systems also make it possible to forward additional non-safe diagnostic signals from the sensors and safety controller to an automation controller. This allows, for example, signals to be evaluated which are relevant to avoiding downtimes or increasing plant availability.

SAFETY PRE-INSTALLED

Another option for safeguarding more complex plants and transferring non-secure diagnostics data at the same time is the safety installation systems from Schmersal. The safety switches are not connected directly to safety controllers or safety relay modules, but simply connected in series via distributor modules.

The passive installation systems can also be fitted with an optional "Serial Diagnosis" (SD) interface for the transfer of non-safe status data. Safety sensors and interlocks connected in series and fitted with an SD interface can transfer extensive diagnostics data via the SD gateway and a fieldbus to a controller, e.g. status data or error messages.

For example, in the MZM100-SD contactless solenoid interlock this could, for example, be error messages, such as "Fault or short at a safety output", "Operating voltage too low", or "Defective actuator" to enable rapid error resolution. At the same time, these extended diagnostic functions will, in future, allow predictive maintenance and the avoidance of maintenance, for example, by forwarding non-safety-related status information to the operational controller, for example, an instruction to readjust the safety door if the door is out of alignment.

VIRTUAL CAGE FOR ROBOTS

Robots will increasingly be used in the digitally networked industry of tomorrow. Cooperation between humans and robots without separating safety fences is one of the hot topics in industrial automation. Schmersal has developed safety controllers for monitoring robots. The safety controller forms the basis for customer-specific solutions. The key features include the automated monitoring of axle position and speed and hazardous movements. If the forces and speeds are low enough, and all the axles are kept in a virtual cage, the robot or machine arm can interact directly with the human. With this development, Schmersal has laid the foundations for some of the newer safety concepts without safety fences which are already in use today.

In order to press ahead with innovation in this future-oriented area, Schmersal is supporting a three-year research project by the Bonn-Rhein-Sieg University of Applied Sciences. The aim of the "beyondSPAI" project is to improve safety in collaboration between humans and robots. Using multi-level sensor systems and intelligent software, the aim is that industrial robots should be able to detect whether there is a person in their movement range or simply an object.

Optical sensors and special process image processing algorithms are used in order to recognise human skin and process this data further. As soon as the robot recognises human skin, it "knows" that the situation is different. Put the other way, this means that if it is only an object moving into the movement range of the robot, a stop to the robot movements is not automatically triggered. This means users can achieve increased productivity and plant availability.

K.A. Schmersal

▶▶ 54706 at www.pcne.eu

TERMINATION CONNECTOR

Designed to replace closed-end (CE) terminals

Molex introduces the MUO 2.5 Termination Connector, designed to replace closed-end (CE) terminals. It will not only reduce cable assembly time for OEMs, but also improve reliability and processing time. The MUO 2.5 Termination Connector has just two retainers (2 and 4 circuits, which can be used in any of the three assemblies (4, 6 and 8 circuits). Retainers cover the terminal lance, protecting assembly personnel from a potential electrical hazard, and it also includes a wire entanglement protection feature. The separated retainers protect the cables and secure the terminal position while preventing the terminal back-out problem, which acts as an additional electrical shock hazard prevention.

54716 at www.pcne.eu

PORTABLE AREA LIGHTING SYSTEM

Adaptable to hand carry and easy to set up

The 9455Z0 RALS from **Peli Products** is a compact 7,3 kg portable area lighting system, adaptable to hand carry and easy to set up. Its multiple safety certifications for global use (ATEX Zone 0, IECEx ia and CI, D1) make it the perfect choice for the professional working in hazardous areas such as in Oil & Gas refineries, Offshore platforms, Fire & Rescue brigades, Petrochemical, among other high-risk industries. Its powerful LEDs radiate 1.600 lumens in high and 800 in low which extends the run time up to 10 hours. Powered by a maintenance-free rechargeable battery, the system offers a wide beam spread of 125° of clean energy that illuminates the entire area preventing workplace injuries.

VIDEO

54717 at www.pcne.eu

PARTICLE MONITORS

Ideal for explosive atmospheres

With the LPM-II-CX, **Stauff** presents the latest generation of particle counters for stationary use with ATEX2 certification according to EU Equipment Directive 94/9/EC. Thanks to the special design of the housing and the connectors, they are suitable for permanent installation in explosive atmospheres (zone 2/category 3G). The device meets all safety relevant requirements, for example for use in the oil and gas industry or in chemical and process engineering. The special feature: The new version is equipped with a large-area front display, which allows users to read out measured values in real time. This enables the machine operator to directly react to increasing contamination of the fluid.

54718 at www.pcne.eu

COUPLINGS FOR HAZARDOUS AREAS

Available with ATEX certification

R+L Hydraulics GmbH presents couplings for applications in hazardous areas. The specialist for power transmission technology and hydraulic accessories has various types of couplings available with ATEX certification, including gear couplings and disc couplings. A wide range of variants of these coupling types is offered, suitable for various potentially explosive atmosphere applications. Disc couplings with ATEX certification are used in pumps and compressors for hazardous areas, for example in the petrochemical industry. The disc couplings are robust, matching harsh environmental conditions. They function practically without wear and stand out due to their high torsional stiffness and zero backlash.

54736 at www.pcne.eu

CLEANROOM TECHNOLOGY

A solution to particle problems

In industrial manufacturing, in science and research the need for a clean particle and germ free environment plays an ever important role. For this purpose, **Spetec** from Germany designed elaborate clean room facilities and offers a cost effective and simple solution to the particle problem. In many instances, it is quite sufficient to create a localized clean room environment. The use of a Laminar Flow Box or a CleanBoy ® establishes clean room conditions at the location where they are needed. The FBS and the CleanBoy® are available as a floor-standing or table-top device. The Spetec clean room devices are equipped with a filter of the type H 14.

54737 at www.pcne.eu

STAINLESS STEEL CABLE

For a heavy duty crane system

Tsubaki Kabelschlepp designed and implemented a solid stainless steel cable carrier including a support structure for a rotating tower crane from AXTech. This was made possible by close cooperation with the customer, advanced 3D simulations during the design engineering phase and, last but not least, extensive testing under realistic conditions. With a lifting capacity of 420 tons, the innovative SHS Tower Crane from the renowned Norwegian manufacturer AXTech allows installation and maintenance of subsea systems and technical equipment in the North Sea: with a motion radius of 180°, it can lift heavy equipment and systems from the ship's deck and into the sea.

54738 at www.pcne.eu

SIL CERTIFIED FLOW METERS

Reduce process downtime

Emerson's Rosemount 8800 Vortex flow meters with a new SIL 2/3 functional safety certification, per IEC 61508, can now be used in facilities with safety instrumented systems, to help mitigate risk, enhance plant safety, and protect personnel. The non-clog Rosemount 8800 Vortex portfolio offers safety and reliability features such as online removable sensors to reduce process downtime and a critical process valve for aggressive applications which increases personnel safety by preventing exposure to hazardous fluids. A variety of configurations are available to suit a variety of requirements, including flanged, wafer, reducer, dual, and quad meter body styles, supporting installations up to 12in (300mm) line sizes. Per an accredited third-party assessment, a single Rosemount 8800 Vortex meter may be used up to SIL 2.

▶▶ 54670 at www.pcne.eu

HYDRAULIC HOSE

With high pressure capabilities

Eaton's range of hydraulic hoses has been expanded with the launch of the Dynamax EC881 hose series. Qualified to 1 million impulse cycles, this new two wire-braided hose has been designed to last and withstand tough applications. Intended for deployment in mobile applications such as compact construction equipment, agricultural vehicles, aerial lift platforms and forestry machines, this hose is also suitable for industrial applications such as hydraulic presses. Thanks to a new generation of inner tube and hybrid plies, EC881 delivers a 35 percent higher pressure capability when compared to standard hoses of standard EN857 2SC. Where expensive four spiral hoses have had been used to cope with system pressures, the new EC881 two wire braided hose can be an alternative hose which helps deliver a direct cost saving for OEMs. The new EC881 hose has been engineered to feature a 50 percent better bend radius.

▶▶ 54211 at www.pcne.eu

SIL2/PLD CONTROLLERS

For the control of hydraulic functions

Parker Hannifin Corporation's Electronic Controls Business Unit can now meet the needs of mobile machinery applications with new functional safety controllers. As well as offering high levels of robustness and straightforward system integration, the new RISE (SP) certified IQAN-MC4xFS controllers have been developed to provide a more cost-effective way of meeting the safety standards required for heavy mobile machinery. Typical applications include reach stackers, aerial platforms, refuse truck loaders, mobile cranes, telehandlers, and steer-by-wire forestry machinery and construction machinery. Designed for controlling hydraulic valves and certified to IEC 61508 SIL2, the IQAN-MC4xFS is an ideal choice for mobile machinery applications where electronic controllers are evolving with safety functions up to SIL2/PLd required.

▶▶ 54194 at www.pcne.eu

Efficiency or Performance? A Question of Choices

At the last SPS IPC Drives, Bonfiglioli launched a new electric motor series: the BSR Synchronous Reluctance Motors, released with two packages: The High Efficiency Package, that provides the maximum efficiency available on the market, the IE4, and the High Output Package, to get high performances in a more compact system. The series comes with a dedicated software to control the motor

At the last edition of SPS IPC Drives, Bonfiglioli launched a new series of electric motors: The BSR series. The new line is a Synchronous Reluctance Motor Technology that reaches IE4 (Super Premium) efficiency class. Comparing it to the standard induction motor, the new reluctance motor combines the three-phase induction motor stator with an innovative rotor. The BSR series works with traditional inverters ACU 410 series but with a dedicated Software.

This new motor series is available in six frame sizes from IEC71 to IEC132. The reluctance motor can be combined with Bonfiglioli standard gearbox. The new motor is designed and assembled in the Mechatronics Center of Rovereto, and the old and new technologies are combined to create the reluctance series. For the optimized control of the motor, a new dedicated internal software was created.

HIGH EFFICIENCY AND HIGH OUTPUT

The new line has been launched with two different packages: 1) IE4 High Efficiency Package which is covering a power range from 0.37 up to 18.5 kW from size IEC71 to IEC132. 2) High Output Package, which provides the customer not interested in energy efficiency with more performance, in two ways: Same size and power range up to 18.5 kW, or a smaller frame size but same output power and efficiency of the Induction motor, which is a more compact system.

In this way, Bonfiglioli is able to target new applications and market sectors, such as material handling for the IE4 High Efficiency Package, and for High Output Package more complicated applications needing torque and speed control.

INDUCTION VS RELUCTANCE MOTORS

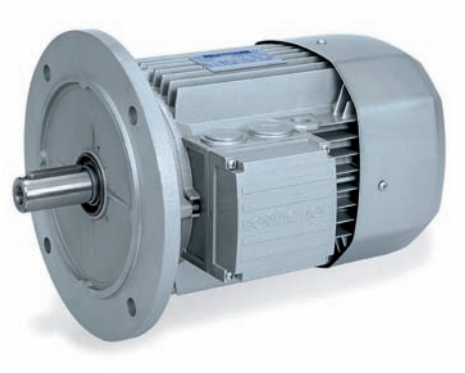
The Induction Motors won't be replaced, as the company's objective is not to replace existing product lines, but to figure out new opportunities and new applications on the market. It's important to point out that the software developed for the BSR series is very performant, allowing as many complicated applications as possible. This will allow a new market positioning, since reluctance motors currently available on the market are meant for entry level applications like pumps and fans. Bonfiglioli aims to find new application opportunities, in sectors like Packaging, Material Handling and Textile. Its main goal is therefore to fully boost its market.

A COMPLEX ENGINEERING

The complexity of the rotor inside the BSR motor, which is designed with a special shape that presents hyperbolic curves, required high engineering efforts to find the best matching between performance and industrialization. The dedicated ACU SW for BSR series includes a new field-oriented control method optimized for various type of applications. For this reason, developing a specific software was essential for vector control, with the addition of new functionalities in order to be very accurate and to allow high torque generation also at low speed. With additional control software developments, even additional application will be targeted.

PRODUCTION EXPECTATIONS

Production expectations for next year will be around one thousand units but the aim is to increase the request more and more thanks to the growing customer understanding of the motor and control benefits. This technology is not only a mechatronic product release but



can also improve the system design. Industrial applications can now include standard gearboxes, frequency inverters, and synchronous motors which are in between induction and servo motors. Bonfiglioli is very proud of this new motor technology that can represent a strong technology for the future.

IOT PHILOSOPHY

Bonfiglioli also looks at IoT and cloud platforms for predictive maintenance. The company had already the ability to sensorize some elements of the motion chain, like gearboxes, inverters, motors. Sensors allow to gather data and through open communication protocols like Ethernet TCP/IP, OPC UA it is possible to send information to local and cloud platforms. Today Bonfiglioli is not providing cloud platforms, focusing on the data and on the associated information content. This is the first step to push concepts such as Energy Efficiency, Smart Factory, industry 4.0, IoT for predictive maintenance and many other essential and useful operations.

Sara Ibrahim

Bonfiglioli Italia

▶▶ 54703 at www.pcne.eu

VARIABLE SPEED ACTUATORS

Enable full control of the motor speed

Auma has enhanced its proven SA actuator range with variable speed models. The new SAV multi-turn actuators for open-close duty and SARV multi-turn actuators for modulating duty are combined with intelligent ACV actuator controls, providing full control of the motor speed at any time. Variable speed offers significant advantages in a wide variety of closed-loop and open-loop control applications, since it allows the optimum operating speed to be selected for each change of valve position. Speeds can be set independently for the open and close directions. An emergency or failure behaviour can also be predefined. Auma's new type range excels in offering an extremely wide speed control ratio of 1:10, allowing operators to benefit simultaneously from both accurate positioning and rapid operation.

▶▶ 54739 at www.pcne.eu

SERVO MOTORS

Designed for Clean-in-Place

The new AKMH Stainless Steel Servo Motor Series from **Kollmorgen** is built to withstand the most rigorous of washdown regimens. The combination of the AKMH's IP69K construction and corrosion resistant materials, make for a servo motor that will last the life of the machine. The AKMH can perform quick cleaning. Designed for CIP (Clean-In-Place) with no need for covers, the AKMH will maximize your uptime and profits. With 19 sizes available in multiple standard configurations, the AKMH family will open the door for more opportunities to replace expensive air or dirty hydraulic axes with a clean and high performing servo motor solution. AKMH Stainless Steel Servo Motor features include: Maximum product safety and improved overall equipment effectiveness; Hygienic housing designed to prevent the build-up of bacteria and dirt pockets.

▶▶ 54740 at www.pcne.eu

ACTUATORS

With an integrated motor

The new Diakont DA78 series electromechanical actuator is now available from **Inmoco** and compliments the existing Diakont range. The DA78 uses the same roller screw technology as the DA67, DA99 and DA140 actuators and offers size and performance levels between the DA67 and DA99 units. All DA actuators have an integrated motor and roller screw to provide superior performance in a compact space envelope. The roller screw design provides a large contact surface for converting rotary torque to linear motion with minimal backlash. This makes the DA actuators best in class in terms of reliability, lifetime, load capacity, tolerance to shock loads, absence of vibrations and output efficiency. The permanent magnet synchronous motors used in the Das are designed to provide precision accuracy in highly dynamic force and motion applications, while also delivering exceptional reliability.

▶▶ 54741 at www.pcne.eu

AIR HOISTING TECHNOLOGY

With an integrated NFC sensor

J D Neuhaus has developed the new Mini series of air hoists and this has resulted in a compact liftin g device with an integrated NFC (Near Field Communication) sensor and service app. With various innovations incorporated in the concept, a multitude of improvements and new developments ensure maximum productivity, occupational safety and efficiency. Special emphasis was placed on reducing the end-user's total cost of ownership (TCO) of the hoist. Reliable processes in the working sequence contribute to increased efficiency, achieved for 100% of the active operation time, by extending the service life significantly. Not only is the hoist optimised for outstanding overall efficiency, but the new Mini is also available around the clock (365/24/7).

54672 at www.pcne.eu

EPMS SUITE

Based on a modular platform

Yokogawa recently released the latest version of an enterprise level pipeline applications suite, the Enterprise Pipeline Management Solution (EPMS) R1.03. The first launch to the market dates back to June 2015. The EPMS suite is the product of over 20 years of Yokogawa experience in implementing oil and gas pipeline management solutions worldwide. The EPMS supplements a core SCADA platform with specific gas and liquid applications that enable a pipeline operator to manage delivery contracts and associated logistics in a safe, cost effective, and efficient manner. It was developed for deployment at the heart of the pipeline operations management environment. The EPMS suite is a sustainable solution made up of pipeline applications that may be used in combination with common supervisory and monitoring functions, and is based on a modular platform.

54492 at www.pcne.eu

PROGRESSIVE CAVITY PUMP

Now available in six sizes

Netzsch Pumpen & Systeme has added to its line of FSIP (full service-in-place) industry-leading NEMO progressive cavity pumps. Ideal for wear-intensive applications, the maintenance-friendly FSIP™ design has been re-engineered to provide full access to all the pumps' rotating parts. NEMO FSIP is now available in six sizes (NM045 to NM105) for flow rates up to 180 m3 per hour and is now offered with differential pressures up to 6 bar (1-stage) up to 12 bar (2-stage), identical to the performance parameters of the standard series. Users can conveniently open the large inspection cover of the pump housing, dismantle all rotating parts, and simply install them again without having to remove the pump from the pipe assembly or having to disconnect wiring. The NEMO's rotor-stator unit can be lifted out after opening the inspection cover on the pump housing.

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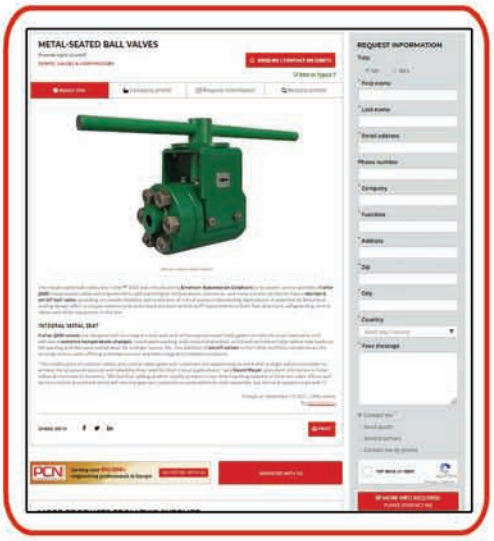

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