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Customers in the cosmetics industry require their machine builders to provide them with packaging systems that feature maximum flexibility because the market demands ever-faster changes in product presentation and packaging. See this month’s cover story for more on how Unista developed an innovative solution based on Beckhoff’s eXtended Transport System and other automation components.
Technology trends for 2020

By definition then, digitalisation is a multi-faceted methodology and some aspects can be expected to gain traction faster than others. These are the ones that are forecast to go mainstream in the very near future. Digital twins and open automation technology are two to watch.

According to ABB, digital twins for measurement devices will become more common in 2020 and the focus will be on optimised engineering, production and maintenance processes. The perceived benefits will accrue from increased ‘right first time’ outcomes through improved process performance modelling, as well as a comparison between ideal and actual performance. Through AI (machine learning) algorithms, anomaly detection will allow abnormal operating parameters to be detected early, before costly defects in product quality or equipment failure bring the line to a halt. See the article on page 32 for more.

On the matter of open systems, the Open Process Automation Forum is in the process of developing technology standards that support interoperability, avoid technology obsolescence and deliver added business value. The basic idea is to reduce the cost and effort required to monitor and optimisation applications, without losing the real-time determinism provided by modern process control and platforms. Proof-of-concept systems recently showed the viability of these ideas and forecasters expect to see workable products entering the market in the foreseeable future. Since this initiative is driven through an end-user consortium that includes the calibre of ExxonMobil, Aramco, BASF, ConocoPhillips, Dow, Georgia-Pacific, and Linde, it will be interesting to see how the big automation vendors adapt. The ARC Advisory Group is close to the progress being made through this ground-breaking initiative and interested readers can find more detail on page 30.

Since no objective rules exist for determining the next big thing, prophesy-style articles are simply the opinion of their authors, and contradictory views abound. The market for commodities is a good example with both bullish and bearish price forecasts in evidence for 2020, all supported by convincing arguments. By contrast, the articles I’ve seen so far on industrial technology trends for the year ahead stand out due to the ubiquity of view shared by all commentators – digitalisation is on the rise.

Since digital transformation is an evolutionary concept, it might be useful to pause for a moment and review the current status quo. Over the last few years, digital transformation has shifted its primary focus from digitisation to digitalisation.

Digitisation involves creating digital versions of previously analog data, such as replacing paper-based work orders with digital versions and replacing legacy analog control and field instrumentation systems with digital counterparts. Digitalisation, on the other hand, involves using digital data and technologies to make work processes more efficient: for example, utilising data from a digital work order to improve maintenance scheduling and execution, or using digital twins to improve engineering processes.
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Emerson named IIoT company of the year for third time

Emerson has been named “Industrial IoT Company of the Year” by IoT Breakthrough for a third consecutive year. The honour recognises Emerson’s commitment to helping customers in industries such as chemical, life sciences, power, and oil and gas to define and execute a practical path to digital transformation. Emerson recently introduced a new, dedicated digital transformation business that combines Emerson’s leading sensing technology, operational analytics and broad services capabilities to deliver targeted digital solutions to customer challenges.

IoT capabilities can enable a step change in performance, but many companies lack a clear path to get there. A recent survey by Emerson showed more than 70% of companies do not have a vision for data analytics with a clearly defined roadmap to success. Emerson’s new digital transformation business brings together critical resources, along with its existing expertise in consulting, project execution, smart sensor technologies, data management and analytics, to help manufacturers develop and implement pragmatic digital transformation strategies.

BMW to source industrial PCs and control panels from Beckhoff Automation

Beckhoff Automation will supply the BMW Group with technology for use in car manufacturing through 2030. According to the terms of the recently signed agreement, Beckhoff will supply the production facilities worldwide. Beckhoff industrial PCs and multi-touch control panels will be used for machine connectivity, access control, data acquisition, visualisation and other PC-based tasks. Standard Beckhoff products will be used that have been adapted to some extent to ensure optimum retrofitting in existing plants and to include customer-specific key extensions. The bundling of all product development steps at Beckhoff, from IPC motherboard and BIOS development to mechanical adaptations, enables optimal answers to customer-specific requirements. In combination with full control over the added-value chain based on in-house assembly, Beckhoff offers the ideal infrastructure for a long-term partnership. In addition, the globally available services provided by Beckhoff ensure optimum support of customers’ manufacturing facilities distributed all around the world.

Rockwell Automation joins digital transformation alliance

Businesses that are digitally transforming their operations need an ecosystem of partners that can help them simplify technology deployments and quickly achieve goals like higher productivity. The new Rockwell Automation Digital Partner Program connects companies to expertise and solutions from market leaders like Accenture, Microsoft, PTC, Ansys, and Eplan to streamline the implementation and enhance the quality of digital initiatives.

Through the programme, businesses can consult with industry advisors to create roadmaps for their digital initiatives and learn how industrial IoT concepts like digital twin, the factory of the future and a connected workforce can improve their uptime and efficiency. During implementation, businesses will have access to integrated hardware, software and turnkey systems from industry leaders that improve business performance leveraging their existing assets.
SMART HOME AUTOMATION

Monthly electronic news brief

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- Temperature control
- Fire detection
- CCTV cameras
- Remote viewing of home and family
- Communications with home and security response company
- Alarm control and remote control/communication
- Access control and identification

Already covering factory automation and Industry 4.0 in our publication SA Instrumentation & Control (www.instrumentation.co.za), security in our publication Hi-Tech Security Solutions (www.securitysa.com), and the Internet of Things in our publication Dataweek, it was a logical next step to cover the subject of home automation and security, without diluting the focus of our existing technical publications.

The monthly Smart Home Automation news brief will cover product information relating to the hardware and software technologies that enable control and management over appliances and devices within a home.
What to expect from the electronics industry in 2020 and beyond

The last few years have been tough within the electronic industry, from Brexit to the China tariffs, to economic struggles. This year, an expected rise in electronic component sales is anticipated, along with less market volatility, so what trends can we expect to see?

Artificial Intelligence (AI) making a breakthrough

Artificial intelligence is a controversial subject. Many people are not in favour of the idea due to the perception that electronic machines will suddenly become empowered with the ability to judge right from wrong. AI could make a breakthrough in 2020 and become more socially accepted as simply machine intelligence, where it could feature in the medical, automotive and education sectors. Within the next decade, AI also looks set to have a significant impact on marketing and sales strategies, where it can be used to leverage customer information and deliver targeted messages back to them.

Multipurpose electronics in higher demand

Multipurpose electronics is the term used for electronics which has more than one purpose. In 2020, expect to see more devices emerge with multipurpose functionality designed to solve storage and efficiency issues. Products such as ‘Alexa’ have proved a success due to their ability to multitask (play music, answer questions, contact people etc.) along with their small, sleek design.

Tariff problems become more pronounced

Over the past year, the world’s two largest economies have been locked in a bitter trade battle over the tariff of goods. This has affected many companies due to increased costs and decreased profit margins. Smartphone camera sensors, glass used in liquid crystal displays and organic light-emitting diode (OLED) screens are specifically affected. Not only this, semiconductor testing and sorting equipment are also included. According to Reuters, import tariffs on multi-component semiconductors will be cut to zero. We can expect possible further tariffs on electronic goods that will have an impact on electronic companies.

Environmental priorities

Environmental impact is hugely topical at the moment, for obvious reasons. One electronics company that has taken this responsibility seriously is Panasonic, with ambitious goals in terms of energy, both efficiency and renewables. As an owner-managed company, Beckhoff also stands for dependable support. As an owner-managed company, Beckhoff has found a supplier with great flexibility and a global distribution network that ensures quick response times, service and support. As an owner-managed company, Beckhoff also stands for dependable cooperation without sudden strategy changes, for continuity in support from long-term contract persons, and for quick decision-making infrastructures when solving technical challenges.

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Husky Injection Molding Systems honours Beckhoff Automation with supplier award

A fruitful development partnership as well as trusting and reliable relationship such as the one that has existed between Canadian machine manufacturer Husky Injection Molding Systems and control system supplier Beckhoff for roughly 20 years now is a rarity these days. Husky recently underscored this by honouring Beckhoff with its EMEA Supplier Award at the K 2019 trade show held in Germany.

When Husky chose Beckhoff as its control systems supplier in 1999, the renowned company was ready to step off the beaten path and work with a pioneer in the area of PC-based control technology. Beckhoff was still a relatively young and small company at the time, so Husky’s decision was not without risk. That the company decided to move forward with the relationship based on its trust in the trailblazing potential of the PC-based control philosophy of Hans Beckhoff. The openness of the industrial PC platform, based on Windows standards, opened up a new world of competitive benefits for Husky. It replaced the legacy control concept, which was based on a multitude of dedicated controllers and PLC hardware, with a single industrial PC and TwinCAT as an integrated software platform.

During the development phase, it quickly became apparent that Beckhoff, with a strong innovative spirit, was the perfect match for Husky as the technology leader in high-performance injection molding machines. After a successful trial phase, Husky went into series production with Beckhoff control systems and declared them the standard for its entire machine portfolio. It was also one of the first companies to rely on the fast EtherCAT standard introduced to the market by Beckhoff in 2003. With EtherCAT, Husky’s machines not only became faster, but also more accurate, which in turn increases performance and quality, while making them more resource-efficient. The technical and economic success of both companies went hand in hand with these developments.

In Beckhoff, Husky has found a supplier with great flexibility and a global distribution network that ensures quick response times, service and support. As an owner-managed company, Beckhoff also stands for dependable cooperation without sudden strategy changes, for continuity in support from long-term contract persons, and for quick decision-making infrastructures when solving technical challenges.

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Rope-access specialist Skyriders has helped keep the lights on for a major retailer at its 75 000 square metre warehouse in Midrand. “We were called on to provide a maintenance service for the lighting, replacing globes that had failed and highlighting any faults to be attended to by a third-party electrician,” explains marketing manager, Mike Zinn.

The fast-track maintenance project became critical as it was affecting operations in the vast warehouse. Skyriders deployed rope access and basic fall-arrest principles to reach roof height and then to move along to the various lights requiring attention. Faulty lights would be disconnected and lowered safely to the ground for the attention of the electrician. Once any necessary repairs had been carried out, the 10 kg light units would be hoisted back up and plugged in again.

Commenting on the application of rope access in a warehouse environment, Zinn points out that it all depends on the set-up and roof height. Traditional warehouses can be accessed easily by means of scissor lifts or even cherry pickers, but a major warehouse like the Midrand facility posed a particular challenge. The fact that it was a fully working warehouse meant that Skyriders had to structure its rope access in terms of specific areas and times so as to facilitate operations. Another challenge was the presence of conveyor systems on the ground, which meant that scaffolding was not ideal to provide access to the lighting.

“Given the constraints of the site itself, and the fact that essential lighting maintenance was required while the warehouse was ‘live’, meant that rope access was the safest and quickest solution for this particular project scope,” concludes Zinn. “Our highly experienced four-person team was able to carry out the work as efficiently as possible,” Zinn concludes.

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South Africa is classified as a water-scarce country, with some projections estimating that, at present, it exploits roughly 98% of its available water-supply resources. In many areas, the water challenge is looming ever larger.

“When a severe multi-year drought, coupled with difficult water-management parameters is experienced, such as was the case in the Western Cape from 2015 to 2018, water-crisis conditions hold serious implications and challenge everyone concerned,” highlights Hanine van Deventer, senior engineer at Aecom.

During the ‘Day Zero’ crisis in October 2017, when the City of Cape Town predicted it would effectively run out of water by March 2018, Aecom was approached by various private companies to provide professional services that would improve their resilience in response to water-supply interruptions.

This was driven largely by commercial interests, as well as liability concerns in terms of safety and insurance requirements. Other aspects were the long-term goal of reduced utility costs, or ultimate independence from the municipal water supply.

“Some clients noticed the impending crisis, requested budget, and engaged early. Some were more structured, but many left these interventions too late, and were required to respond to all the critical concerns simultaneously to manage the immediate crisis,” points out van Deventer.

The emergency solutions and mitigations ranged from fairly innovative to more radical measures. Water-saving initiatives included replacement of conventional sanitary fittings with water-saving technology. Supplementary water sources were also investigated. These included rain and grey water harvesting, reclaimed groundwater, potable water tanker supply (trucking water in via tanker water service), and use of bottled drinking water.

“When faced with the daunting task of implementing infrastructure to combat an unprecedented event such as ‘Day Zero’ in Cape Town, stakeholders are often not aware of the level of intervention required;” concludes van Deventer. “In a world where climate, environmental, and demographic changes impact our access to water, it is imperative to ensure that the risks posed to water security are mitigated effectively by improving our state of resilience.”

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rain launches intelligent 5G transport network

Mobile data network operator, rain, has launched its intelligent 5G transport network in partnership with Huawei. CTO Gustav Schoeman elaborates: “With Huawei’s E2E solutions and new products, our first 5G users can experience 5G ultra-high speed broadband service at home. We will further strengthen its partnership with Huawei in 5G network innovation and practice to offer a top service experience to users.”

In terms of 5G transport network construction, Huawei embraces the concepts of ultra-broadband network, intelligent connectivity, and committed high availability. The NetEngine 8000 M series intelligent metro routers provide high-density 10GE-to-site access and 100GE uplink, accommodating demands for rapid traffic growth. The fabric architecture achieves a large capacity and congestion-free forwarding. The Optical solution uses Huawei’s 200G+OXC solution based on OSN 9800 equipment, providing huge bandwidth with lower cost of per bit and reduced optical-layer commissioning time, while also saving on footprint and power consumption. Huawei Network Cloud Engine (NCE) also enables service automation and intelligent O&M on this network. The E2E IP network with optimal optical foundation and intelligent NCE helps to build the low-latency and superior-experience 5G transport network.

“With both parties dedicated to constructing highly efficient, stable, reliable, intelligent, and trusted 5G transport networks, the partnership between rain and Huawei is aimed at offering more digitised services to the South African market,” says Leo Liu, CTO of Huawei Network Marketing and Solution Sales Dept.

Drawing on Huawei’s 5G end-to-end solution, rain’s 5G network deployment in Phase 1 will cover the major regions of Johannesburg and Pretoria. It will be expanded to cover all major cities and towns in South Africa and provide supreme ultra-broadband services for homes and enterprises.

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Cummins supplies power solution to Zain Jordan

Cummins authorised distributor, SETI Jordan, has provided a complete power solution, from project design to installation of the genset and switchgear, for Zain’s headquarters in Amman. This included special design and consultation for the generator foundation base.

Zain’s headquarters consists of three buildings, one of which houses the main data centre and core equipment. It reconfigured the existing power sources for the two storey building by adding a new utility path and transformer, which required a new backup genset for the utility.

A Cummins C1675DS genset, installed inside a 13 metre sound-attenuated PowerBox container, provides 1500 kVA of reliable backup power for the utility in the second path of electricity. Zain Jordan has been a Cummins customer since 2004, with around 60 installed gensets to date.

Cummins is also the power provider at hundreds of other Zain installations in the region, including mobile base stations and the Kuwait headquarters. Cummins’ ability to meet unique requirements of the project, such as low noise and vibration levels with the PowerBox, along with SETI Jordan’s capabilities in delivering the complete turnkey solution of supply, installation, testing and commissioning, in addition to aftersales and service capabilities, are key features of the partnership with Zain.

Zain Jordan introduced mobile phone services into the country in 1995. Part of the Zain Group, it has led the telecom sector by continuing to invest in new technologies and partnerships. With over 8000 cell sites, Zain Jordan covers the entire kingdom.

Over the years, the communication landscape in Jordan has evolved through many other firsts from Zain: it was the first Middle Eastern operator to launch MMS, mobile data services and infotainment solutions, and the first to introduce WAP connectivity, 4G/LTE and mobile banking in Jordan.

For more information contact Deepa Rungasamy, Cummins Africa Middle East, +27 11 589 8512, deepa.rungasamy@cummins.com, www.cummins.com
Michael Brown’s Practical Process Control Training Courses and Loop Optimisation Services

Courses:
These well known courses are unique and invaluable to new comers as well as experienced practitioners and process engineers in the field of industrial regulatory control optimisation. The courses offer a new and very practical approach to this subject, which very few people really understand properly.

Courses are available on demand for six or more delegates and are suitable for instrumentation and control technicians and engineers, and for plant process engineers. Many chemical and mechanical engineers have attended the courses as well as metallurgists.

Even people with many years of experience in this field have found the courses a real eye opener.

Optimisation Services and Consulting:
Michael Brown has had 35 years of experience in control loop optimisation, and in that time has successfully optimised controls in many different types of plants, including pulp and paper, power stations, chemical and petrochemical, oil, steel, mining and metallurgical recovery, cement, brewing, glass, dairy, food, and sugar, both in South Africa and many overseas countries.

His work has proved invaluable to plants and has resulted in greatly improved performance and ROI.

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MICHAEL BROWN CONTROL ENGINEERING CC

www.instrumentation.co.za February 2020 9
February marks the end of my 2-year term as elected president of the SAIMC, so it is a great time to reflect on what has happened in the past two years.

Industry 4.0
Industry 4.0 has been a continuous focus point where we even saw tangible commitment from the president of South Africa. Although the representation on these committees is mostly from the academic fraternity, we are grateful for this step in the right direction. It is now up to industry to ensure that we give our input to this forum. Within the SAIMC, we have seen enormous progress from the individuals focusing in this area.

Education
Education is changing; we all know it. Most of us will quickly google something or watch a YouTube tutorial or take an online course when we need knowledge. But, our education system has not adapted, and we worry about our kids and the students in tertiary institutions as we hear how industry needs individuals with different skillsets and knowledge to that which is currently provided. Within the SAIMC we are partnering with industry and education to ensure that we are part of the change to ensure that our fraternity adapts and is future fit.

Sustainability
We have continued to show focus on delivering a service to our members.

Structure changes
Going into 2020, there will be a lot of changes to our structure. The aim is to ensure that we create optimal opportunity for members to have a voice and be able to pursue their passion within industry. This is built on a legacy started by our current directors in a relentless pursuit of improvement to challenge the norm and be the guiding voice in industry.

Branches
We have eight SAIMC branches in South Africa, and one in Zambia. We see continuously how the branch managers have worked endlessly with their teams to ensure that the members in their area are getting the networking opportunities and knowledge sharing that is relevant to them. The activities within the branches vary and that is part of the excitement for the members – knowing that you really can join a technical tribe to share your passion for technology.

Collaboration
We have continued collaboration as this is a key component of our success and ability to ensure that we challenge the norm to facilitate change. Continued relationship building with industry, educational institutions and government remains a high priority. The SAIMC is built on people and the work that each one does to ensure we all have a better future. For that, I would like to thank every person who has been a part of this journey.

Thank you to everyone I have interacted with over the last two years. I am proud to be part of an organisation which is showing social responsibility, dedicated to change and creating opportunities for individuals that are aligned with their passion.

Yours in automation,
Annemarie van Coller.

Branches

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Johannesburg branch

When you are passionate about the industry that you work in you can achieve great things. The Johannesburg branch proudly achieved Gold Status for 2019. This was a team effort by all involved and included the following:

• Sponsoring of two scholars from Sutherland High School to compete in Spain for the robotics competition, where they took first place. #ProudlySouthAfrican.
• Technology driven events held each month, where we all learnt more about products, applications and processes within industry.
• Networking opportunities at the ladies tea, on the golf course at Jackal Creek and at our Year end Function that was held at Marks Park.

For 2020 we are hoping to improve on what we offered in 2019, for all our loyal members. The year promises to be full of technology evenings with companies like Festo, Endress+Hauser, RJ Connect and Beckhoff etc., teaching us new things. For the social part of the calendar we will be hosting another ladies tea event as well as a golf day – looking forward to seeing you all at the planned events.

Should you be interested in joining us at the Johannesburg branch of the SAIMC please feel free to contact us directly jhb.secretary@saimc.co.za.

Durban branch

Industrial fieldbus and Ethernet: installation considerations and problem diagnostics were topics presented at the Durban branch’s final technology evening of 2019, held at the Durban Country Club on 4 December. The excellent attendance of almost 60 people, which was a pleasant surprise for this time of the year, indicated the relevance of the topic.

Kyle Roos, deputy chairman of The Profibus, Profinet Organisation of Southern Africa, explained the support available for those systems in the region. After pointing out the differences between Profibus and the Ethernet-based Profinet system, he spoke about fundamental requirements for their successful and reliable installation. There was strong focus on grounding and cable termination requirements, and he demonstrated how the information could get corrupted unless both aspects were installed and maintained correctly.

Kyle had a demonstration system which he used effectively throughout his presentation to help him visually respond to the numerous questions from the audience. After many questions had been answered, the formal presentation ended with chairman Hennie Prinsloo thanking Kyle for giving the talk and sponsoring the evening. Discussions continued over dinner and drinks.

The Durban committee is extremely pleased with how attendance has increased over the past year, and will be aiming to maintain or even increase the interest being shown, especially among newcomers.
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Process Dynamics

Process Dynamics specialises in industrial automation and process control. The company is one of Africa’s leaders in turnkey automation projects and specialises in the integration of scada (WinCC, PCS7, Wonderware, Citect) and PLC (Siemens, Schneider, Rockwell) as well as MCC and control panel manufacturing and installation. Process Dynamics is ISO 9001:2015 accredited as well as a registered CIDB company.

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SAM – Systems Automation and Management

Systems Automation and Management is a supplier of data acquisition systems and innovative automation solutions and is one of the leading integrators of PLC, scada and fieldbus systems in South Africa. The company’s comprehensive range of capabilities includes industrial networks, automation and control, scada, custom solutions, information delivery, data warehousing, hardware and software, BMS, MIS and MES.

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Contact: jane@technews.co.za
Proconics came into being in 1995. Through acquisition, organic growth and cutting its teeth on petrochemical giant Sasol, it has developed the capability to execute electrical and instrumentation engineering design projects of diverse scale and nature.

The company is adept at dealing with the unknown and has a track record with notable brownfields renewal projects and an ability to enter complex, hazardous operating environments and deliver bespoke renewal solutions. Quality is an absolute as is the delivery of true value for its clients. The company is truly global, with major office centres based in South Africa (Secunda, Sasolburg and Durban), Australia and the Middle East (Qatar).

Proconics employs over 200 qualified employees – ranging from engineers, designers, project managers, health and safety personnel – all dedicated professionals who take pride in their work and the organisation’s fundamental principles of delivering excellence to clients by believing in people, never compromising on safety and acting with integrity.

Clients, in both the private and public sector, are among the world’s biggest and best in their fields – Sasol, Eskom, BHP, Linde, ABB and Siemens, to name a few. Proconics’ size and breadth and depth of expertise make it the ideal partner to manage or participate in complex greenfields and brownfields electrical and instrumentation projects.

A local base with world-class experience
With its feet planted firmly on South African soil, Proconics has partnered and collaborated with some of the globe’s top engineering firms. The head office in Secunda, the industrial capital, allows it to deliver effectively on current projects, while the proximity to Pretoria and Johannesburg connects the organisation to Africa and the world.

Awards
Proconics has received several awards from independent parties and professional bodies and have also formed part of project teams which have received recognition for outstanding performance. Some of the more notable awards include:
- Sasol Badger award – project of the year 2009 – member of the team.
- Sasol Technology awards 2011 – reforming & U90 fire damage repair project.
- Sasol Synfuels project team of the year 2012 – phase 8 switchgear replacement project.
- Sasol Chemical operations project of the year award – U24/70

Certifications
- Registered gas practitioners able to issue COCs for SANS 329.
- Certified functional safety practitioners.
- Professionally registered engineers, technologists.
- Certified Master Installation electricians.

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Emerging structural market forces (internal and external) are reshaping the chemicals industry, and seemingly for the worse. This is due to evolving market indicators. New Chinese entrants into the market are yielding overcapacit y in some product lines and increasing competition in others. A 2017 McKinsey & Company report on the chemical industry contends on for slowing global demand by arguing, amongst others, that a middleclass car that a Chinese buyer trades up to does not necessarily contain more polymers than an entry level model. Secondly, trends in diet and nutrition are radically shifting the chemical space and bringing about new complexities. Against the indispensable moral obligation for chemicals companies to embrace the circular economy concept, it is likely that chemicals companies will be subjected to state regulations and pressure from customers to do more recycling (plastics etc.) with the cumulative effect of global demand reduction.

These set of challenges would be incomplete without mentioning the recent resurgence of nationalism, embraced by the current US administration and Brexit discourse, which threaten to rewire and somewhat re-localise the internationalised chemical industry. Chemicals industry internationalisation brought growth over the years fuelled by intercontinental demand pull (e.g. demand pull in Asia), and the reverse (re-localisation) may prove dire.

Should these market shifts persist the chemical industry may have to brace itself for a bleak future. Against this backdrop the proposition is for companies to look to digital technologies and innovation for rescue, and most importantly, to go beyond the molecule.

This means going beyond the current trend of operational efficiency to outcome based business models and customer interaction improvement amid changing customer behaviours and rising expectations. To this end, could chemicals companies rewire their business model and give their B2B customers the online relevant B2C tools such as product search, configurations, recommendations and status notifications? This leads to exploration of digitalised value chain collaboration alternatives.

**Digitalised value chain collaboration**

An emerging alternative is to disrupt one's own value chain processes and leverage on B2B platforms, similar to the Alibaba or Amazon business. A case in point is a German-based BASF, largest chemical producer in the world. After realising how customer behaviour was evolving, BASF opened an e-store on Alibaba in 2015 and secured access to a large number of small and medium-sized Chinese enterprises that already use the Alibaba platform. This move enabled BASF to begin servicing a new consumer segment – customers with relatively small scale and diverse needs.

Alibaba operates the largest online B2B platform for small businesses, handling sales between importers and exporters from more than 150 countries. At the centre of these already sophisticated e-commerce platforms are ‘no-touch’ merchandising processes, where sales orders and warehouses are automated to a point where some purchases require no human intervention. In addition, these platforms offer customer analytics, trend-sensing technology, dynamic pricing analytics, and can foresee developments downstream in customer – and even in customers’ customer – industries. Acting on these insights, suppliers can respond quickly with customised offerings, while at the same time leveraging on embedded lower cost to serve profiles. This type of value chain ecosystem collaboration, particularly in the supply chain, becomes important in managing increasingly adaptive complex chains, along with current volatility pain points in demand and supply. The benefits include, but are not limited to, access to new customers, smooth transactions and low costs to serve, powered by economies of scale phenomena.

Being bold and making early moves towards adoption of these digital value chain collaborations will aid in fending-off newly emerging market challenges and yield value in the long term.

**Oratile Sematle**

Executive director, SAIMC

Oratile heads a digital studio at Sasol Chemicals and leads multi-skilled agile teams tasked to deliver Minimum Viable Products (MVPs) such as predictive/dynamic pricing models, demand planning and optimisation and AI/ML engines using SCRUM and KANBAN frameworks. He holds a BSc degree in electrical engineering as well an MBA from the University of Cape Town. As a former president of the Society of Automation, Instrumentation, Measurement and Control (SAIMC), he helps to drive the vision shared by council to address issues specific to the automation industry, and is partly accountable for the development of the automation engineering profession in South Africa. Oratile is a conference speaker and has spoken at engineering events such as Industry 4.0 and African Automation Fair. His ambition is to form cross-industry coalitions to tackle the social and educational problems experienced by disadvantaged communities.
Customers in the cosmetics industry require their suppliers to provide them with packaging systems that feature maximum adaptability and flexibility because the market demands ever-faster changes in product presentation and packaging. To meet the needs of cosmetics company Shiseido, equipment manufacturer Unista developed an innovative solution based on the eXtended Transport System (XTS) and other automation components and software from Beckhoff.

Shiseido is a Japanese maker of high-end cosmetics with an international presence. Founded in 1872 in Tokyo, it is one of the world’s oldest cosmetics companies. Its European headquarters and two manufacturing plants have been based in France for thirty years. Machine manufacturer Unista, located in the Nantes region, was selected by Shiseido to develop and build two packaging machines. Since Shiseido uses containers in many sizes and shapes for its diverse portfolio of products in the luxury segment, the equipment had to deliver a maximum of flexibility.

Unista has produced packaging lines for ten years and specialises in robot-supported equipment. The newly developed machine model supports many different container types and lot sizes while keeping setup changeover times to a minimum.

Unista’s goal was to meet the central demand for flexibility without compromising the engineering, the motion controls and the production process. Anthony Forget, managing director of Unista France, explains: “To accommodate the broad product portfolio of Shiseido, we needed an extremely flexible machine.”

“Unista’s needs were very much in line with the properties of our XTS transport system, which now functions as the machine’s central component and makes the production much more flexible,” adds David Ranchy, sales engineer at the Beckhoff office in Nantes.

Unista employed an XTS with a track length of 4 m, which enabled them to keep the machine compact and put the available floor space to its best use. The transport solution is supplemented by two 6-axis robots for product handling. The first robot takes care of the loading and unloading. It places the filled cosmetics jars on the XTS, which uses 11 movers to transport them to the respective processing stations. The second robot places lids on the containers and lightly screws them in before they are fully closed with a specific torque and rotation angle at the following handling station. At the final quality control station, the containers are sorted into good and reject units. One of the key requirements involved was protecting the high-value cosmetics containers against any kind of damage to ensure that the packaged products are in line with the high quality standards of the Shiseido brand.

Operational agility
One key advantage of the XTS in that context is the individual product transport, which is not subject to rigid synchronisation between the processing stations. As a result of the individual and highly precise positioning with the movers, the machine delivers maximum throughput paired with gentle product handling.

In addition, the software-based control functions make it easy to adapt the system to changing formats, such as container diameters, on the fly. All it takes is a change in the software parameters instead of a complex and expensive machine reconfiguration.
“Unista’s needs were very much in line with the properties of our XTS transport system, which now functions as the machine’s central component and makes the production much more flexible.”

**A universal hardware and software platform**
Besides the XTS, Unista also employs servomotor terminals and servomotors from Beckhoff for the handling unit that screws on the lids. Other components from the Beckhoff portfolio include EtherCAT Terminals for the communication between the control components as well as TwinSAFE products for machine safety. The benefits are readily apparent. Sourcing all components from a universal hardware and software platform means a single point of contact and fast and easy integration.

The entire machine is controlled by a space-saving, cabinet-mounted CX5140 Embedded PC that runs TwinCAT 3 automation software. The drive technology of the handling unit features an especially compact design. EL7211 servomotor terminals control the dynamic AM8100 servomotors, which are connected via One Cable Technology (OCT). This reduces the cabling costs by 50 percent and gives the machine a very tidy appearance. A CP3918 Control Panel displays Unista’s own user interface.

**Simplified engineering and reduced time to market**
The simple engineering and straightforward commissioning with XTS and PC based control enabled the experts from Unista to complete a ready-to-operate machine in less than ten weeks. With its short time to market and high degree of operational flexibility, the XTS application for Shiseido represents a prime example of mechanical engineering in the age of Industrie 4.0 that is at the forefront of cosmetics packaging.

For more information contact Michelle Murphy, Beckhoff Automation, +27 11 795 2898, michellem@beckhoff.com, www.beckhoff.co.za
Pharmaceutical instrumentation has to be safe and easy to use, and contribute to the reproducibility of processes. The reliable and lasting performance of VEGA’s proven instrument portfolio has enabled plant operators to monitor and control with great precision chemical, thermal or biological processes, often under high temperatures and pressures. The modular basis of the proven instrument platform plics has enabled it to stand out from other competing products. Its highly compatible design and standardised adjustment concept pave the way for especially versatile application possibilities. An intelligent, proven modular system of sensors allows individual configuration: starting with selection of the right measuring principle, to connection and setup, to service. Operators benefit greatly from continuous plant availability and process reliability.

New sensors for hygiene-optimised standard applications
In pharmaceuticals production, trends towards continuous production processes and more intensive networking are bringing new challenges. In response, VEGA is expanding its portfolio for pharmaceuticals production to include a compact instrument series because the industry is not just looking for solutions for extreme applications, but for simple optimisation and efficiency improvement in many areas.

The company is focusing on a new series of compact pressure sensors and level switches that can be used to automate standard applications cost effectively. The focus here is on compactness, flexibility, safety and optimised hygiene.

The new Vegabar and Vegapoint instrument series are the answer to the growing demand for simple sensors with reduced variants that support increasingly efficient pharmaceuticals production. This requires more standardised products that are as easy as possible to use, but still cover all basic hygiene requirements. It also calls for better networked products, with easy connectivity to existing control systems and mobile devices.

Uniform standards extend through all areas of application. This applies especially to the fully hygienic adaptor system, which is designed to be compatible with the Vegabar pressure sensors, as well as the Vegapoint and Vegaswing level switches. Therefore, not only can it be flexibly selected, but also adapted, according to individual needs and – if necessary – quickly exchanged.

The acid test of CIP and SIP passed
Time is becoming an increasingly important factor in pharmaceutical processes, in particular for the production of high-potency drugs: especially when this takes place under strict cleanroom conditions. CIP and SIP cleaning are some of the most time-consuming process steps. The potential for savings here lies essentially in cleaning and sterilising systems more quickly through consistent hygienic design. However, in view of the industry’s extreme cleanliness requirements, this assumes that the cleaning process can be fully relied upon. It requires components whose geometry does not allow microorganisms to collect in dead spaces and which are also capable of withstanding the cleaning and sterilisation processes themselves.

The aggressive cleaning agents used in CIP and the high steam temperatures used in SIP also demand correspondingly high chemical
resistance as well as temperature and pressure resistance. The new Vegabar and Vegapoint instrument series are resistant to both. The pressure sensors and level switches can tolerate high temperatures without loss of function and even cope with the combination of high temperature and long exposure times.

### 360° switching status display

Sensors are often used in very large spacious areas or in very tight spaces. The effort involved in reading a sensor quickly becomes considerable when a hygiene barrier first has to be overcome. However, it is crucial to be able to see sensor readings quickly and easily, so that operators can react as quickly as possible, especially in the event of a fault.

To ensure that the status of a process can be recognised at a glance from as far away as possible and from any direction, the development of the new sensors focused on simple handling, and the fast and easy readability that comes along with it. Thanks to the round, 360° display, all switching states can be visually detected from any direction. The colour of the illuminated ring, which can be freely selected from 256 different colours, remains clearly visible even in daylight. This allows the operator to choose the colour that is best visible in his particular environment, and it is up to the operator to choose the colour that best suits his needs and offers maximum additional safety and distinguishability in critical situations. It immediately shows the user if measurement is taking place, if the sensor is switching or if there is a possible malfunction in the process.

### New compact instrument series with IO-Link

In their maintenance decisions, plant operators rely on status data, which forms the basis for optimal planning of shutdown times. Almost all system builders now deploy intelligent sensors with I/O technology, as it offers universal advantages when it comes to data availability. Not only can these be quickly and cost-effectively installed using standard three-core cable, but, with IO-Link, sensors can also be replaced especially easily and without the risk of errors. The system can be put into operation correspondingly faster with the standard protocol, which reduces production downtime considerably. The option of having all sensor parameters written automatically into the new instrument by the IO-Link master or the controller during a replacement also makes for additional efficiency. Fast format or recipe changes, which are typical in the pharmaceutical industry today, can be carried out quickly and centrally in this way. The bottom line is that using IO-Link saves time while reducing the potential for errors to zero. In the end this ensures higher product quality, more optimal utilisation of the machines and increased process speed – in other words, noticeable savings.

### Efficient automation from a single source

Hygienic design, system availability, modularisation and networking are the decisive factors for greater efficiency in pharmaceutical processes and for asserting oneself in the face of growing competition. With its decades of experience, VEGA offers ground-breaking level and pressure measurement technology for the automation and monitoring of future-oriented production systems that operate under extreme conditions and strict requirements on system safety and flexibility.

The new instruments are perfectly tailored to standard applications that nevertheless require high quality. The standardised adaptor system of the compact versions provides the flexibility needed to keep effort and costs at a reasonable level through optimised spare parts stock-keeping. Their process fittings can be selected as needed and flexibly adapted to local requirements. And there is also sensor intelligence on board: the standard IO-Link protocol ensures especially simple, intelligent communication, which means that the instruments have a universal communication platform that enables seamless data transfer and simple integration into the control system. They are thus prepared for the production processes of the future and are already making a contribution to the implementation of Industry 4.0.

### Food grade electric chain hoists

New to Becker’s range of Kito hoists are food grade electric chain hoists, designed for safe lifting applications in contaminant controlled and corrosive processing environments, particularly the food and beverage sector where cleanliness is critical.

“Kito food grade ER2 series electric chain hoists meet the highest quality, hygiene and safety standards for lifting equipment used in food, beverage and pharmaceutical processing,” says Rick Jacobs, senior general manager consumables, Becker Mining South Africa. “It is critical that all equipment used in the food and beverage industry complies with stringent quality and safety requirements, to eliminate food safety risks.”

Lubricants used on the load chain and in the gearbox are NSF H1 compliant for use in facilities where incidental contact with products is a concern. Other standard features of the Kito food grade ER2 series include white epoxy paint, stainless steel and nickel-plated hardware, nickel-plated load chain, food grade oil and grease, a fail-safe brake and an extreme duty TEF cooling motor.

These hoists are available as single speed units or with adjustable dual speed selection.

Optional corrosive-resistant trolley kits include stainless steel trolley wheels, stainless steel guide rollers and a nickel-plated suspension shaft and suspension. Specially-designed accessories, for added convenience and enhanced performance, consist of stainless steel, fabric and plastic chain covers, as well as protective silicone pendant covers.

Mounting options include hook to hook, motorised trolley, plain trolley or geared trolley for smooth, precise and easy traversing and positioning. Maintaining safe and stable operation is critical for lifting equipment. To ensure these hoists are in pristine condition and operate effectively, it is critical that they are tested regularly at Becker Mining SA’s workshops, or at any certified repair centre.

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**www.instrumentation.co.za** February 2020 19
BMG’s Light Materials Handling division has launched a new range of dry running conveyor components for the food and beverage sector that offer high productivity, low energy and reduced water consumption, as well as a safe and hygienic work environment.

BMG has also introduced a new condition monitoring system, which has been developed to automatically monitor the coefficient of friction of bottling or canning lines, ensuring consistently high productivity levels.

“In recognition of the importance of optimal safety, hygiene, sustainability and efficient total cost of ownership (TCO) BMG has further improved its range, through the development of new products, to meet the latest global requirements,” says Ryan Forsyth, business unit manager, Light Materials Handling division. “Our new range of dry running belts with approval for direct food contact from leading global manufacturers, have important advantages over our original and conventional acetal chains and belts. These features include higher chemical and abrasion resistance, lower friction, greater strength and extended service life.

“The reduced coefficient of friction properties of dry running conveyor components enable end-users to reduce or eliminate chain and belt lubrication, providing a true dry running conveyor. Improved sliding properties result in reduced power consumption, increased wear life, lower dust generation and the ability to run at higher speeds, with higher loads. Other advantages over acetal chains and belts are improved product stability and efficient flow.”

This advanced technology reduces the need for soap, water and chemical-based lubrication, resulting in dry equipment and floors, thus a safer work environment, with sustainability improvements, reduced bacteria growth and further cost savings.

**Regular maintenance not required**

Running dry also eliminates the need for regular maintenance and component replacement because a dry operation is easier on conveyor bearings, frames and the chain or belt. Excellent chemical resistance also extends the operating life.

BMG’s new condition monitoring device continuously measures the coefficient of friction, to ensure efficient handling and flow of all container types, including PET, glass and cans. Variations in the coefficient of friction are reliable indicators of changing conditions and even pollution of the conveyor, especially in dry running lines.

This device is a complete unit, with sliders, which can be mounted on a conveyor and integrated into the line control system, to temporarily or continuously monitor friction. The condition monitoring unit is programmed to collect performance data, obtain data for trouble-shooting or to act as continuous input for the line controls. It can also be used as a stand-alone or portable device for spot measurements, without the need for operator intervention.

Obtained data is then used to calculate the average value, as well as the standard deviation and the trend. These values trigger an alarm if pre-set limits are reached and based on this signal; the user can check the situation and take corrective action before efficiency is compromised.

Another key feature is an easy-to-define optimum cleaning regime called ‘Smart Cleaning’. Long-term line conditions can be analysed using data obtained through Ethernet or Modbus connections.

A permanent control process of real-time monitoring of the line condition helps to maintain optimum conditions, ensuring high efficiency of conveying in food and beverage plants.

BMG’s extensive range of belting for food and beverage processing includes slat-top and mat-top chains and belts, Ammeraal Beltech’s KleenEdge non-fray synthetic belts, Uni modular belts including Pop-up flight solutions for inclined food conveyors, flat food processing belts and Rapplon flat processing transmission belts.

All products for food handling, bottling and packaging applications meet the highest conveying and packaging standards, in terms of reliability, flexibility and consistent quality and hygiene controls.

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Washdown protected photoelectric sensors

Banners new T18-2 photoelectric sensors have an FDA-grade shatterproof plastic housing and are IP69K rated and Ecolab certified to protect against water ingress and chemical washdown.

IP69K and epoxy encapsulation for wet environments: the T18-2 series sensor is designed to withstand high pressure and temperature washdown. The epoxy fill eliminates internal air cavities in the housing that could lead to condensation inside sensors during temperature cycling.

Ecolab certified FDA grade plastic: the sensors have been tested by Ecolab to certify that they resist damage when exposed to common cleaning chemicals. The plastic used throughout the T18-2 is made of FDA-approved, shatterproof plastic for use on food production lines.

Improved design for easier cleaning: crevices have been minimised to eliminate debris build-up. The knurls have also been removed from the nut and the light pipes have been over-moulded for easy cleaning. All labels have been removed and replaced with permanent laser etching.

Installing the nut, optional seal kit, and bracket will cover all exposed threads on the nose.

Durable ultrasonic weld for a superior seal: ultrasonic welding is an advantage of using an all-plastic housing and creates a superior joint. Metal sensors contain plastic windows and other components that are joined mechanically or with adhesives. The joints are then subject to thermal shock because the metal and plastic components expand and contract at different rates, creating small gaps and allowing water inside the sensor. Ultrasonic welding fuses plastic components into one solid piece of durable plastic that is not affected by thermal shock.

Target applications include harsh washdown environments with temperature cycling such as food and beverage processing, packaging and cold storage.

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SEW-Eurodrive is assisting the bakery industry to improve efficiency and reduce energy consumption by means of its Movigear mechatronic drive system. The company has enjoyed a longstanding relationship with Dale Spiral Systems & Bakery Automation of Johannesburg.

The main advantage of Movigear is that the combination of servo motor, gear unit and electronics are combined in a single system that is highly reliable and hygienically designed. “Apart from reducing start-up costs, it also plays a vital role in cutting total operating expenses in an industry where pricing is the main factor,” comments Adam Sweeting, operations director, Dale Spiral Systems & Bakery Automation.

The company was established in 1998 by Chris and Jill Dale, who sought to transfer their considerable expertise in bread conditioning and cooling to South Africa. Twenty years later, the company is an acknowledged global leader in its field, holding a number of patents, and continually developing new equipment and systems in response to client requirements.

Extending the shelf life of bread

Conditioning or cooling extends the shelf life of bread significantly, as well as limiting the weight loss during the process, with much less handling required than traditional systems. The OEM has evolved from supplying conveyor systems only to a turnkey solutions approach that encompasses all ancillary equipment, from ovens to provers, spirals, conveyors, mixers and robotics.

“We have taken 20-year-old machines and reconditioned them to an ‘as new’ condition,” explains Sweeting. “Our extensive experience in this regard has allowed us to develop our own equipment that improves on existing systems, under trademarks such as Bakermation, Coolermation, and Mixermation.”

The company initially approached SEW-Eurodrive to supply drives for its conveyor products. Teething problems with suppliers eventually resulted in Dale standardising on the German drives due to their reliability, range of power options, and ability to maintain a constant torque rating.

The drive to promote Movigear in the bakery industry will allow Dale to increase its market penetration by focusing on refurbishing existing systems, many of which are outdated, and hence not equipped with the latest energy-saving and monitoring equipment. “While the initial capital outlay is perceived as the main stumbling block for such a conversion, we educate customers as to the long-term benefits and the impact on total cost of ownership and return on investment,” stresses SEW-Eurodrive sales representative, Nick McKey.

Energy intensive industries such as bakeries and food and beverage plants are increasingly looking to reduce their energy consumption, which is where the one-fit Movigear system has a role to play. Features include high overall efficiency, from the motor to the gear unit and electronics, an optimised interface between the motor and gear unit, highly efficient gearing, smart control methods, IE4 (super premium efficiency) compliance, and a compact design with optimised housing.

Another major benefit is that any future automation that may be required can be integrated seamlessly, while additional options such as trouble shooting and problem solving can also be accommodated. Bakeries often have limited space, which means that the reduction in cabling and smaller cabinets required also add to the value proposition.

“There are proactive clients in the bakery industry who are keen to move forward through technology such as Movigear, which gives them an advantage in this highly competitive industry,” comments McKey. “Another advantage for customers is the aftermarket support and technical backup we offer.”

The strong relationship between the two companies is testament to how SEW-Eurodrive focuses on the specific requirements of a particular industry, concentrating on the best products for a turnkey solution that is modular and adaptable to future needs.

Commenting on the current state of the bread industry, Sweeting concludes that while there has been a lull in projects such as new production lines and facilities, there is a definite opportunity for sustained growth in the southern African region for upgrades to ageing mechatronics technology and automation systems.

For more information contact Jana Klut, SEW-Eurodrive, +27 11 248 7000, jklut@sew.co.za, www.sew-eurodrive.co.za
FOOD, BEVERAGE & PHARMACEUTICAL

CIP design, planning and installation

A complete system for a company specialising in the transport of liquid food.

The CIP system consists of four tanks for fresh water, cleaning agents, returns and wastewater, plus the parallel cleaning system for up to three trucks. The independent process lines are designed for fast, hygienic operation that is optimised in terms of ecological and economic aspects. From the tanks installed in the basement, cleaning media is pumped upwards into the milk or food trucks and flows back from there through hydrostatic pressure. In contrast to the otherwise frequently practiced ‘lost process’, the circulation and multiple recycling of the cleaning agents was a crucial requirement due to environmental protection and cost aspects. The advantages provided by such a system include:

- Complete process sensor technology for reliable and sustainable CIP cleaning from a single source.
- Inline measurement of critical parameters enables precise process control and thus a verifiable quality for the certification of the cleaning.
- High measuring accuracy and short reaction times ensure resource efficiency (e.g. saving of cleaning agents, reduction of wastewater volume) a crucial requirement here due to environmental protection and cost aspects.

CIP cleaning takes place in three stages
1. Pre-rinsing with water from the return tank.
2. CIP cleaning with 1-phase cleaner, then depending on concentration either recirculation into cleaning agent tank or discharge into return tank.
3. Flushing with fresh water with discharge into the return tank.

For reliable and certifiable cleaning and maximum utilisation of the cleaning agents, temperature, conductivity and flow rate must correspond exactly to the specifications. These values are controlled permanently and with the utmost precision inline.

For all applications in the process, Anderson-Negele sensors were able to offer an appropriate solution, thus ensuring optimum function, efficiency and process reliability for the end user.

Principle of operation
Different measuring methods ensure process reliability for the tanks. Capacitive level detectors NCS-M-11, installed at the top and bottom, transmit the full or empty signal to the PLC with the shortest reaction time in order to reliably prevent overflow during filling or pump idling. Type L3 pressure sensors are used for permanent volume measurement and to monitor the exact filling level. The temperature is continuously measured by dead-leg optimised TFP-161 sensors.

For correct cleaning, the media must always be pumped into the truck and their integrated spray heads with a specified, optimum pressure. Installed right after the pump, electromagnetic flowmeters and pressure transmitters accurately monitor this process step. After the cleaning process, the media are analysed inline and their return to the corresponding tanks is monitored by calorimetric flow switches.

The analysis of the return media is one of the most important steps for an environmentally friendly and cost-efficient process. The ILM-4 inductive conductivity meter plays a central role in precisely determining the phase separation: during the discharge of the liquids at each cleaning stage the media are differentiated with cost-saving accuracy. Reusable cleaning agent that flows off after cleaning can thus be returned to the tank to the maximum possible degree. In a separate, internal circulation and for permanent optimum cleaning result, its concentration is adapted to the specified ideal value by re-dosing with detergent and fresh water in the cleaning agent tank. The ILM-4 conductivity meter also ensures the highly precise measurement of conductivity and temperature required here.

For more information contact Morton Controls, 086 100 0393, sales@mortoncontrols.co.za, www.mortoncontrols.co.za

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Hygienic limit switches for processes

Process and storage vessels incorporate limit switches to prevent overfilling of a tank or vessel (full indicator) or dry running of a pump (empty indicator). Anderson-Negele’s NCS series are ideally suited for the reliable measurement of limits in media with low water content, such as certain alcohols and cosmetics, providing universal application in bottling and pharmaceutical applications.

Capacitive working principle
Anderson-Negele level switches operate on the basis of the capacitive working principle. The measuring electrode, the medium and the conductive wall of the tank form an electrical capacitor influenced by three main factors: distance; area of the electrode surfaces; and type of medium between the electrodes.

The measuring electrode and the tank wall serve as the capacitor plates while the medium acts as the dielectric fluid. Due to the higher dielectric constant of the medium relative to air, the capacity increases when the electrode is immersed in the medium. Exposing the electrode has the opposite effect. The change in capacity is analysed by the level switch and converted to a corresponding switching command. The sensor outputs a 24 V DC signal (active output). The minimum and maximum (full/empty) switching functions can be swapped by reversing the polarity of the power supply.

The capacitive working principle requires that the sensor tip, which is made of PEEK, be completely immersed in the medium. The advantage is that the sensor does not respond to foam or adherences and a signal is emitted only when the medium reaches the level. Capacitive measurement is most reliable when the dielectric conductivity and temperature of the medium are constant. Changes in the outer conditions are generally non-critical in media with high dielectric constant values.

For more information contact Morton Controls, 086 100 0393, sales@mortoncontrols.co.za, www.mortoncontrols.co.za

Precise position measurement in packaging

Precision monitoring and accurate measurement of distances is essential for smooth running in both production and intralogistics operations. Optical distance sensors are generally used for this purpose and fulfil several different functions, according to Gerry Bryant, managing director of Countapulse Controls.

This specialist sensing solutions provider offers a comprehensive range of optical distance sensors that can pinpoint measurement, position and facilitate quality assurance of any object over both long and short distances.

“Leuze optical distance sensors are based on various measurement operating principles including triangulation, propagation time and phase measurement,” Bryant says, “These enable both the reproducible measurement of distances in the range of tenths of a millimetre, as well as over larger distances in excess of 60 metres.”

Significantly, with the accelerated move by most operations to Industry 4.0, the measurement data can be transferred with IO-Link and evaluated by software in the machine. This is important as based on the real-time values obtained, production processes can be constantly adapted and optimised.

In quality assurance applications, particularly during the assembly process, the completeness or alignment of individual components must be ensured. The Leuze ODSL range of optical distance sensors uses extremely high resolution to define and check all reference points. These sensors are capable of reliable functioning even where objects include plastic and metal housings.

Another example is in machining processes where raw material needs to be fed into the machine without any interruption occurring. This means that the stack height on the load carrier must be constantly monitored. Using a combination of Leuze optical distance sensors with different resolutions and ranges makes it possible to measure the height of differently stacked objects.

The operating range of up to 65 metres, together with the focused laser, makes positioning an easy task on production or assembly lines which move large components such as engines or vehicles. The distance of these objects can be measured to a specific reference point allowing optimum accuracy.

For more information contact Gerry Bryant, Countapulse Controls, +27 11 615 7556, bryant@countapulse.co.za, www.countapulse.co.za
SICK Automation South Africa recently installed 120 image-based 2D barcode readers across multiple scanning stations in a South African tobacco manufacturing plant. The cigarette manufacturer was looking for a solution to move from its manually intensive marking and tracing system, which facilitated human error and lacked a satisfactory verification process, to a modern technological one.

The client’s objective was to ensure the plant retained its ability to produce world-class products. This would be achieved through increased product traceability and improved quality control. SICK recommended its Lector 620 Professional image-based barcode readers, part of the Lector 62x product family, specifically designed for improved product and process traceability.

The installation of these barcode readers has ensured that the plant has technologically up-to-date unit level traceability on all product elements. This extends from the container-stored tobacco blends through the entire production process, ending with the cartons of cigarette boxes contained in palletised containers for distribution. The Lector 620 range includes a fail-safe microSD card in case of device failure, which automatically loads all required device settings when inserted into a new device.

“Traceability allows for safe products to be manufactured while protecting the production process,” points out Mark Madeley, marketing manager, SICK South Africa. He adds that among the benefits of the Lector 620 Professional is the automatic parameter switching ability. "This allows the barcode reader to change its settings between four different modes, thereby accommodating variances in lighting conditions." The software used can also artificially enhance the barcode to ensure the highest possible read rates and its image capturing ability conducted simultaneously to scanning is another advantage. "No-read images are saved, providing our client with the ability to diagnostically ascertain the cause of the fault and implement timeous remedial action," adds Madeley.

All devices were pre-programmed according to the manufacturer’s standards with the plant’s maintenance engineers receiving device competence training.

Increased traceability for tobacco manufacturer

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Continuous optimisation and increasingly automated processes are shaping the history of process automation, as well as that of industrialisation. This driving force of progress has led to new measuring principles as shown by the evolution of the vibrating fork concept, also called vibronics, but even this is now subject to digital transformation. Ultimately, the purpose of it all is to make work easier for people and to give us humans the freedom to do what sets us apart – use our brainpower.

Why are field device manufacturers continually developing new technologies? On the one hand, these technologies make work outside in the field easier. Fewer qualified personnel are needed and the technologies boost process automation and expand the scope of applications for the measuring devices. This has been true in the past and will continue to be true going forward. The difference is that the speed of change and new products is increasing. On the other hand, the users want to pay only for what they actually need. This is why NAMUR, an international user association of automation technology in process industries, drafted its recommendation NE131 to include the expectations for how 80% of conventional application cases should be covered in order to minimise costs. The main idea behind measuring devices is that they should reliably take care of whatever problems users are trying to solve.

All-metal sensor in demand

Long before NAMUR released this recommendation, the late 1970s to be precise, Georg H. Endress envisioned the development of a new technology. He wanted to make a sensor that was all metal, and thus permanently sealed. The idea was to use one rod in all conventional applications to reliably check whether there was liquid present in a tank or container. When his developers received these specifications, they had their work cut out for them. Capacitive and conductive measuring principles were out of the question because they could not be implemented in an all-metal design. The developers had to think of something completely new. They ended up presenting their boss with a symmetrical dual-rod solution instead of the requested single-rod. A piezoelectric drive causes the two rods, arranged in a fork shape, to vibrate. As soon as there is a medium covering the metal fork, the vibration frequency changes, and the sensor generates an output signal.

At first, Endress was disappointed to hear that the single-rod solution could not be implemented. Nevertheless, he took his chances on the dual-rod’ experiment’. Because, in the end, what was most important to him was for the all-metal sensor to become a reality. This innovation increased the range of the technology, as it could then be used in any media. Not to mention that an all-metal sensor is incomparably more durable than plastic materials. A new measuring
principle had been born that detected the level limit no matter what the medium involved. They called it vibronics.

In 1983, the measuring instrument with the vibrating fork hit the market. There was a competition among employees to come up with a name for the product. Endress himself selected a name from among the suggestions: Liquiphant. The name is based on the image of an elephant with two tusks in liquid.

Investment in the new technology paid off. During the first year, Endress+Hauser expected to sell 500 units, but in reality, 5000 units were sold. The developers gave the design a quick overhaul to make it easier to produce in line with the standards for a top-seller.

**New applications**

Today, Endress+Hauser produces 330 000 Liquiphant units each year. The measuring device is being used in more than six million applications worldwide. The success of the device is due to the fact that it provides exactly what users actually need and are willing to pay for in their applications. At the same time, the Liquiphant made life easier for people. In the oil and gas sector, refineries describe the Liquiphant as one of the safest and most reliable measuring instrument that they have in their applications. The device switches in time to prevent overfilling and protects pumps from dry-running.

Compared to float switches, the Liquiphant is quite straightforward to use in plants. Vibronics measuring devices do not require maintenance and have a long service life. The Liquiphant has also been developed in accordance with IEC 61508, which means that it is designed for use in SIL2 and SIL3 applications. In addition, it is corrosion resistant.

**Digital potential**

Anyone who is currently preparing their company for the digital age will have to optimise both their information technology and field levels. This requires sensors that can provide the relevant data for initiating process optimisations and efficiency boosts. In the technology road map to ‘Process sensors 4.0’; NAMUR requires opening up a second, mobile way for communication with the sensor. This way has to provide sensor information for preventive maintenance. NAMUR also requires that product information such as manuals or certificates be available in mobile form on site at all times.

This is where the most recent technological innovations on the latest Liquiphant generation – the FTL51B – come into play. As an added feature, all product and diagnostic information is digitally readable, which eliminates the effort involved in reaching the device in difficult locations. The device displays what state it is in using an LED or in diagnostics using Heartbeat Technology. The Heartbeat Technology concept also verifies the device and provides all necessary documentation for institutions. Users derive process optimisations from this and find out what needs to be done for preventive maintenance. Recurring testing in accordance with SIL and the German Water Management Act (WHG) is straightforward on the new Liquiphant. Users simply press a button and step through a wizard.

In the end, any technological innovation is judged on more than its potential. It is also evaluated based on the tangible effects it has in making life easier for users and giving them the freedom to further optimise operations. Therein lies the advantage that humans have over machines. We have the common sense to distinguish real added value from gimmicks, and let technology take care of all the arduous, error-prone steps.

For more information contact Natlee Chetty, Endress+Hauser, +27 11 262 8000, info@za.endress.com, www.endress.com
When employing heat treatment as part of a manufacturing operation, the critical information needed is the temperature of the product as it is taken through the heating process. Achieving the correct temperature—and for the correct time—can significantly affect the quality of the product, whether it be the cure on a painted car body or the physical properties of a heat-treated aerospace part.

Temperature profiling: understanding the basics

When employing heat treatment as part of a manufacturing operation, the critical information needed is the temperature of the product as it is taken through the heating process. Achieving the correct temperature—and for the correct time—can significantly affect the quality of the product, whether it be the cure on a painted car body or the physical properties of a heat-treated aerospace part.

The temperature profiling process

Temperature profiling is the term used to describe the process of recording and interpreting the temperatures of products through a heating process. Temperature data is measured continuously using thermocouples connected directly to the product at different locations as it travels through the oven or furnace. The measured temperature readings are stored in a data logger, which moves along with the product and is protected from the hostile environment of the process by a thermally insulated box referred to as a thermal barrier.

Either during the process (using telemetry) or post-process, the profile data are retrieved from the data logger and transferred to a computer software package where they can be reviewed and analysed. Temperature data collected from the profiling operation provide a graph/profile showing what temperatures the product or oven experienced during the entire heating procedure. Such information creates a thermal fingerprint of the product and process, which is critical to the understanding of the heating operation. In its simplest form, this information tells how hot the product became, the time it took to get to that temperature, and how long it stayed at that temperature. Process engineers know what the perfect profile for their product should be. Variations from the ideal indicate a potential problem that can lead to unacceptable product quality.

Why profile the process?

Routine temperature profiling delivers reliable data to optimise processes, prove process control, and make corrections when required. Today, however, compliance and traceability are also key issues. A product report proving compliance to manufacturing specifications may not yet be a requirement, but will likely be a selling point in the future. Other benefits of profiling include the following:

- Control product quality: Increased scrap, rework or customer returns means something has gone wrong in the manufacturing operation. Knowing precisely what is happening to a product during production results in easy reduction of rejects, rework, scrap and returns.
- Rapidly setup new processes: Routine monitoring of the process establishes a database of profile information, which will help develop new processes accurately and efficiently. This gives information on exactly what temperature settings and line speeds will result in the best quality product.
- Find faults quickly: When a problem occurs because of improper heating, the cause and location can be spotted quickly. The profile information can then be analysed to determine the necessary corrective action and run follow-up profiles to prove the changes were successful.
- Increase productivity: Analysis of temperature profiles will also show how and where operations can be optimised. By rebalancing the time at temperature and heat ratios, it is possible to increase line speed and product throughput; and by knowing exactly what is happening to the product in the process, it is possible to minimise time spent on test runs and process setups, allowing a greater number of profitable production runs.
- Prove process control (IQS/ISO9000): A profiling system, combined with a well-designed software package, will go a long way to assist in reporting process control adherence to authorities and customers.
- Minimise fuel costs: Rising fuel costs can significantly impact the operating budget. Information retrieved from profiling can help cut down on excessive heat settings. Lower fuel costs mean higher profits, and reduced fuel consumption has a positive environmental impact.

Conclusion

Understanding what is happening to a product as it travels through an oven or furnace is the first step to controlling and optimising that heat treatment process. Temperature profiling is a critical tool used to help obtain that understanding.

For more information contact R&C Instrumentation, +27 11 608 1551, info@randci.co.za, www.randci.co.za
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Morton Controls in partnership with Anderson-Negele has introduced the innovative NSL-F level sensor based on a modular device platform. The new platform strategy used with this sensor is based on a building-block principle that offers great flexibility in the assembly of individual sensor components.

Users benefit from the advantages of the system and profit from the reliability with which these sensors provide measurements, even in strongly adhesive and foaming media. For example, the device will accurately display that a tank is empty even in the presence of substantial foam. Due to the short response time, highly accurate metering processes can be reliably realised with the NSL-F – even with alternating and pasty media.

Anderson Negele's specific Flex-Hybrid technology allows for easy operation of the sensor with either digital IO-Link or analog 4-20 mA technology, as well as in parallel with both interfaces. Other features include:

- Status control and sensor diagnosis for preventive maintenance and avoidance of production downtime.
- Interference-free plug-and-play technology with standard cable for time and cost-saving installation and commissioning.
- Uniform configuration for all sensors without the need for company-specific programming adaptors.
- Easy sensor replacement: automatic detection, configuration and parameterisation when plugged in.

Applications include continuous level monitoring in metallic vessels up to 3 m in height, level monitoring in feed vessels suited for adhesive and pasty media, level measurement in storage tanks of foaming media, and content measurement in pressurised vessels.

For more information contact Morton Controls, 086 100 0393, sales@mortoncontrols.co.za, www.mortoncontrols.co.za

Compact flow sensor with IO-Link

Turck has introduced the FS+ flow sensor, another product from its fluid sensor series. The sensor is protected in a robust stainless steel housing, together with a one-piece translucent front cap and is operated like a smart phone via a wear-free touchpad.

In addition to flow, the FS+ can continuously measure the temperature of the medium. How the probe is aligned in the pipe is not important here. The bicolour 11-segment LED strip enables either flow or temperature values to be displayed as required. Optimum readability guarantees the possibility to turn the sensor housing and display freely around 340° even after mounting.

For rapid commissioning, the FS+ makes it possible to detect PNP/ NPN signals automatically. Users can also set a switch point in just a few seconds using the Quick Teach function. Thanks to the Delta Flow monitoring functions, all Teach functions are only activated when the flow is constant, thus eliminating any potential sources of error. Robust materials and the seamless sealing concept of the sensor enable compliance with protection types IP6K6K, IP6K7 and IP6K9K. This enables the FS+ to be used in harsh environments, and, for example, to reliably monitor cooling circuits or cleaning processes.

The FS+ flow sensor is based on Turck’s new fluid sensor platform and is therefore a continuation of the modular, freely configurable mechanical concept. The first devices of this generation – the PS+ pressure sensors, which already won the IF Design Award when launched – have been available since March. Other compact sensors for temperature measurement and level measurement will be added to the fluid platform in future.

For more information contact Brandon Topham, Turck Banner, +27 11 453 2468, brandon.topham@turckbanner.co.za, www.turckbanner.co.za
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The new Liquiphant FTL51: rock-solid reliability

- Liquiphant is well-known for being a versatile, robust and easy to use point level switch
- With safety by design, developed according to IEC 61208, it perfectly fits to SIL2/SIL3 applications
- Heartbeat technology detects corrosion directly and minimizes the verification effort considerably
Two ABB experts predict measurement trends for 2020

A look back at developments in industrial measurement technology in 2019, and a look forward at the expected trends for 2020 from two leading ABB experts: Dave Lincoln, digital lead, ABB Measurement & Analytics; and Dane Maisel, VP business development, ABB Measurement & Analytics Americas.

It is hard to escape the tide of digitalisation that is steadily sweeping over the industrial world, with companies embracing the latest digital technologies as they search for enhanced performance and competitiveness.

When it comes to instrumentation, there is no doubt that the benefits of digital technology, particularly its accuracy, range and depth of information, make it the logical choice for measurement in industrial applications.

With precise, pre-analysed data, operators and process engineers have a much more accurate picture of what is happening in the plant.

Looking back at 2019

R&D a priority for instrument and analyser manufacturers

- 2019 saw dramatic shifts in the priorities of the instrumentation industry recently, with more investments in R&D. This includes service and customer tools, CRMs, sales and service.
- Many of the patents lodged by manufacturers of measurement devices over the last 12 months or so have been in areas such as IIoT and digital diagnostics.
- In the past, investment would have been primarily on new measuring technologies and products, meaning that 2019 saw this important shift in direction continue.

Crossover between industry and consumer digital experiences

- 2019 saw greater interaction with instruments and analysers and an in-depth look into designing them to work more like the electronic devices we use in our everyday lives, such as smartphones and tablets.
- Manufacturers responded to this by developing solutions that enabled devices like an iPad to be used to configure an instrument or communicate with other measurement devices.
- The year saw buyers increasingly applying their experience and expectations as consumers when specifying and purchasing equipment for industrial applications.
- The growth of augmented reality
  - Suppliers were more readily experimenting with augmented reality, particularly for maintenance.
  - The benefit of AR is that it makes complex activities simpler – AR enabled guiding improves worker performance and provides a strong training tool, helping to meet the challenge of finding skilled staff.

“The focus will be on Digital twins being used to modernise processes and optimise production and maintenance.”

Unlocking the power of Big Data

- Data analytics has been the hot growth industry in 2019, with lots of analytics solutions and companies in the market, so the growth of data analytics in 2019 is likely to continue throughout 2020.
- The market has matured with much more opportunity to get data from a device and into the cloud, meaning raw data is more accessible and can be turned into valuable information much more quickly.
- There is also a greater understanding of the practicalities of what you can do now, and how data processing and intelligence has evolved to allow this.

Looking forward to 2020 – key trends in instrument and analyser technology

Digital twins

- Digital Twins for measurement devices will become more commonplace in 2020.
- The focus will be on Digital twins being used to modernise processes and optimise production and maintenance.
- Digital twins will be used to optimise system design and increase ‘Right first time’ outcomes through improved performance modelling.
- Digital twins will also enable an online performance comparison between actual and ideal conditions. Through machine learning anomaly detection, algorithms will be able to identify abnormal operating conditions before they create costly problems in terms of product quality or equipment failure and process shutdown.

Collaboration

- ABB Measurement & Analytics will continue to develop deep, collaborative partnerships, a trend also being followed by the automotive and consumer product industries.
- The future will increasingly see companies such as ABB and other providers of measurement technology working together in certain areas, producing joint design efforts and more packaged solutions, particularly in some of the more evolutionary technologies and protocols.
- This will benefit all parts of the industry including customers who will be the recipients of evolutionary solutions that leverage the consolidated strengths of these partnerships.

Advanced digital services: technology literacy

- The rise in services offered in the fields of measurement and analytics will continue. Virtual reality (VR), augmented reality (AR) and mixed reality (MR) are changing the way in which services are offered.
- Increasingly, manufacturers of instrument and analyser equipment will be able to take new and different approaches with customers and provide different services to them.
- Remote services offer a good example, where lessons from different sites and situations are applied across the organisation to inform and improve best practice.
- AI will grow in popularity, moving from something attractive – a ‘nice-to-have’ – to something expected.
- With fewer people reading instruction manuals, apps that make documents available electronically and enable a higher level of intuitive configuration through materials including how-to videos, are set to be a game-changer.
- The service model for measurement devices will shift from one where people are required to be technology-literate people to one where technology becomes people-literate.

Smart predictive maintenance

- As IoT becomes more widely adopted, there
will be significant advances in predictive maintenance in instrumentation, even moving beyond this to Smart Predictive Maintenance (SPM).

- SPM monitors the digital connection network created through IoT. It will enable the automation of maintenance measurement tasks using cognitive data processing technologies. SPM will be linked into other maintenance systems to eventually enable full automation over time.

**Open technology**

- Open technology will, once again, be increasingly important in helping users to get the most from their instruments and analysers.
- The 2019 trend showed that customers are becoming increasingly resistant to proprietary connections, and 2020 will see them increasingly look for a multi-supplier approach.
- A lot of manufacturers are working on emerging platform-based products, broadening their offer to be more of an environment that you operate in.
- Overall, the drive in 2020 continues towards a more open platform allowing greater co-operation between manufacturers and their products on both hardware and software areas, as well as the interfaces between these elements.
- Real net-enabled tools and products that are designed to support practical, everyday solutions, rather than simply being ‘me too’ or ‘digital for digital’s sake’ products, will come to the fore in 2020. The development for these will be driven by both customers and manufacturers alike.

**Changing innovation sources**

- 2020 will see a continued trend for manufacturers to lead the advances in instrument and analyser design. This is due to a shortening of the cycle-time between fundamental research in universities leading to technological advances that can be used in the industries served by groups such as ABB.
- 2020 will also see the impact of the consumer factor. Advances in technology have traditionally come from the military and space sectors, yet the change of pace in the consumer market is now a material driver in dictating what manufacturers need to offer to their industrial customers.
- 2020 will be about two-way communication and collaboration on innovations. Instrument manufacturers will need to transform their relationship from a vendor-based to a partnership model.

**New measurement techniques**

- Non-invasive measurement broke a lot of ground in 2019 opening up measurement points that have not previously been accessible or cost-effective. This trend is set to continue well into 2020 and beyond, offering a strong area for growth.
- Multi-variable instruments: ‘ride-along’ sensors that can be attached to whatever device is being built to make the datapoint available (such as exact ambient temperature).
- A strong portfolio of measurement sensors combined with the edge and cloud will provide the winning combination for 2020.

For more information contact Sumaya Abdool, ABB South Africa, +27 10 202 5617, sumaya.abdool@za.abb.com, www.abb.com
Capacitive level limit switch

The Capanivo level limit switch can be used in most solids and liquids as a full or empty detector. The robust, glass reinforced PPS (polyphenylene sulphide) sensor is suitable for food applications while also resistant to many types of aggressive material. The probe is able to handle build-up in applications like syrup, honey, oil and tomato paste, and can easily switch between for example oil and water, or foam and beer. The sensor can be used in storage and process vessels or pipes, as a limit switch and also a spillage detector.

The electrodes in the sensor make up a condenser: as the level of the material changes, the capacitance changes as well. The integrated electronics evaluate the change in capacity and convert it to a switching signal.

Other features include:
• Compact 2-wire sensor.
• Inverse Frequency Shift technology.
• Use in metallic and non-metallic containers.
• Integrated cable, enclosure and synthetic versions available.
• High sensitivity (DK value 1.5).
• Temperature from -30 to 100°C.
• Robust version for overpressure up to 10 bar.
• Optional PVDF probe.
• SensGuard cover.

The Capanivo has approvals for hazardous locations (Ex) and is therefore suitable for use in most industries as a limit switch in liquid, slurry, foam and interface applications.

New slurry sensor from Emerson

Emerson’s Rosemount MS Slurry Sensor with the Rosemount 8782 Slurry Transmitter is a slurry magnetic flowmeter specifically designed for high noise and slurry applications for use in the oil and gas, mining, and pulp and paper industries. Featuring robust coils and advanced signal processing, a responsive yet stable flow signal is possible even in high noise applications. With over 25 years of experience delivering products for these challenging applications, the new slurry magnetic flowmeter helps improve product quality, reduce raw material cost, and minimise waste and re-work.

The slurry magnetic flowmeter, or slurry mag, provides a flow measurement solution for customers with fluids that contain large solids, mining ore, pulp or sand, or that experience high process noise or signal instability. Featuring the latest advanced signal processing that is the first to adapt to changing process conditions in real time, the slurry mag eliminates noise from the flow signal without using excessive damping, giving operators confidence in their measurement calculations.

Accurate measurement of process flow rates is essential to running a plant or mill efficiently – that is why the slurry magnetic flowmeter uses advanced signal processing with real-time diagnostics to deliver flow measurement confidence and the ability to automatically control the loop.

The meter includes more standard diagnostics such as the grounding and wiring fault detection that helps ensure the meter is installed correctly the first time. Optional advanced process diagnostics help provide insight into performance through a high process noise detection diagnostic as well as enable proactive maintenance in applications where coating may be a concern, such as in pulp digester applications where pitch from the wood fibres may result in coating of the meter.

Finally, the 8782 contains Emerson’s patented Smart Meter Verification capabilities providing a simplified means of troubleshooting or verifying the meter, taking a process that used to take hours and simplifying it down to minutes. While the 8782 transmitter is designed to work with the MS sensor, it is also compatible with existing 8707 installations making the performance, signal processing and advanced diagnostic capabilities available to anyone who is already using Emerson’s solutions for these challenging applications.

“Through the utilisation of advanced features, the Rosemount slurry magnetic flowmeter can help our customers better achieve their operational goals,” said Laura Chemler, product manager with Emerson’s Automation Solutions business. “The advanced signal processing is able to adapt to changing flow rates without getting bogged down by traditional damping practices, providing more accurate flow rate feedback when it’s needed most which in turn helps to ensure an efficient overall process that minimises waste and optimises utilisation of precious resources.”

For more information contact Devesh Roopnarain, Emerson Automation Solutions, +27 11 451 3700, devesh.roopnarain@emerson.com, www.emerson.com

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The ultimate goal of most industrial automation applications is to obtain actionable insights from data sources for more precise decision-making. To achieve this, businesses need to make their field data accessible to information technology (IT) or operational technology (OT) systems. Read on to learn how Moxa’s easy, reliable, and secure connectivity solutions can facilitate such industrial applications.

Taking data to the cloud: all OT field data can easily be transmitted to the cloud. Instead of spending extra time and resources on OT/IT integration, simply migrate all field device data to the cloud. Focus on developing applications to avoid the complex integration between OT and IT systems using ready-to-run edge connectivity solutions to connect multiple serial, Modbus, EtherNet/IP, or I/O field devices to private clouds through generic MQTT, or to public clouds through reintegrated Azure or Alibaba Cloud SDKs. With intuitive UIs, it only takes a few steps to complete the cloud selection, connection, and message tag settings between the field and cloud. To speed up OT/IT integration project development, choose a Moxa edge connectivity product.

Q: What if my Application requires programmability or data pre-processing?
For applications that require edge computing, Moxa’s UC series of edge computers is available. These Arm-based industrial computers support WiFi/LTE connectivity and various communication interfaces. The optional ThingsPro software enables easy Modbus data acquisition and supports cloud connectivity for Azure, AWS, Alibaba Cloud, and generic MQTT.

For more information contact RJ Connect, +27 11 781 0777, info@rjconnect.co.za, www.rjconnect.co.za

Wireless control of pumps

The ability to control a pump remotely over distance and without using wires is simple using Omniflex Teleterm Radio RTUs over a licence free band, avoiding administration of radio frequency band use. Easily customisable to suit any application means users can be up and running in hours. Using the preconfigured templates simplifies implementation even on more complex systems.

A PLC and radio in the same unit
A system can comprises two or more Teleterm Radio RTUs each in a weatherproof housing with a built-in PSU and standby batteries; one housing at the remote control end with all the I/O dedicated to control inputs and pump feedback status, and another at the pump side with all the I/O dedicated to control outputs and pump feedback inputs. The built-in radio allows up to 20 km line of sight between two sets of controls. This allows easy plug and play functionality with only the wiring of the power supply and the control circuits required. A touch screen HMI (fully customisable) can be provided to do the control of the pump and to visualise the pump/system statuses, eliminating wiring of switches and Bulls eye lamps. The on-board Ethernet port also allows connection to an existing scada system thus saving on additional hardware. The system has the following key features:

- Programmable Teleterm units in PLC language IEC61131 for local automation.
- Touch screen interface for visualisation and any manual user controls.
- Instant status of any outstations at a control point: no polling is required, the system reports by exception i.e. change of state triggers data transmission to optimise the radio bandwidth and thus performance.
- No radio protocol programming is required: simple configuration of data queries and subscriptions.
- Modbus RTU and Modbus TCP communication ports are standard on all units. Adding scada, VSD drives, power meters etc. can be accomplished with ease.

Teleterm system benefits

- Plug and play operation.
- Configurable and easy customisation.
- Distance up to 20 km wirelessly.
- Low power operation.
- Alarm logging option on the Teleterm M3.
- Easy installation.

These benefits make it ideally suited for any remote control pump operation with the flexibility to customise the system for even complex controls like pump rotation and usage/efficiency statistics.

For more information contact Ian Loudon, Omniflex, +27 31 207 7466, sales@omniflex.com, www.omniflex.com
Enterprise-level wireless infrastructure management

Emerson has added two new IIoT solutions to its Plantweb Insight data analytics platform that will enable industrial facilities to transform the way they manage their enterprise-level wireless network infrastructure.

As digitalisation and wireless technology adoption continue to rapidly expand in industrial facilities throughout the world, the need for greater visibility of network infrastructure performance is key. These new Plantweb Insight applications provide a quick-to-implement, scalable IIoT solution that helps customers advance their digital transformation strategies and achieve greater operational efficiencies.

The new application provides continuous, centralised monitoring of WirelessHART networks to provide a singular, consolidated view of the status of all wireless networks in a facility, with embedded expertise and guidance for advanced network management. A key feature is the configurable mesh network diagram, providing visualisation of network design and connections along with device-specific information. It also provides an exportable record of syslog alerts, network details outlining conformance to network best practices and more.

While the new network management application provides a holistic look at wireless networks, the Plantweb Insight Power Module Management application drills down to the device level, allowing facilities to keep their wireless devices appropriately powered so they can continuously transmit key monitoring data. By aggregating power module statuses, users can evolve traditional maintenance planning and implement more efficient and cost-effective practices.

“We were able to infuse a decade of experience with wireless technology into these new offerings,” said Brian Joe, wireless product manager with Emerson’s Automation Solutions business. “Our customers will now be able to manage and improve hundreds of networks through a singular interface, realising significant efficiencies in individual network and wireless device management and maintenance.”

These new applications further enhance the Plantweb Insight platform, a set of pre-built analytics primarily focusing on monitoring key asset health. Other applications in the platform include pressure relief valve monitoring, heat exchanger monitoring and steam trap monitoring.

For more information contact Devesh Roopnarain, Emerson Automation Solutions, +27 11 451 3700, devesh.roopnarain@emerson.com, www.emerson.com

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Flow control valves from BMG

BMG’s Fluid Technology division supplies and supports an extensive range of components for fluid technology systems and general industrial applications. These products include valves, hydraulic hoses and fittings, accumulators, cylinders, heat exchangers, hydraulic motors and hydraulic plumbing, as well as pumps and reservoir accessories.

Important valves in BMG’s portfolio include InterApp Bianca and Desponia butterfly valves, which are recommended for high efficiency and safe use in demanding industrial flow control applications.

“Robust butterfly valves are designed for dependable shut-off and control of corrosive fluids, as well as high-purity applications,” says Willie Lamprecht, BMG’s business unit manager, Fluid Technology Low Pressure. “Compact butterfly valves, with good flow characteristics and low maintenance requirements, are extremely versatile and ensure dependable operation, even in the toughest environments.

Unlike a ball valve, the discs of butterfly valves are always present in the passageway within the flow. This means a pressure drop is induced in the flow, regardless of the position of the valve. Ball valves should only be used for isolation, whereas butterfly valves can be safely used for isolation and control of flow.

“An advantage of using quarter turn butterfly valves, rather than other types, is the simple, wafer-shaped design with fewer parts for easy repair and minimal maintenance.”

Long service life in aggressive media
BMG’s InterApp Bianca centric butterfly valves, with durable PTFE liners, are built for long service-life and are suitable for aggressive and corrosive fluids and for applications where absolute purity is essential.

These high-performance valves, which are available in sizes between DN 32 and DN 900, are manufactured with a ductile iron, carbon steel or stainless steel body, to suit the requirements of all industries. Bianca butterfly valves can be individually configured by BMG to ensure dependable operation and optimum safety in specific applications.

For example, FDA compliant Bianca valves (DN 50 – DN 200) with mirror-polished stainless steel discs and high-purity PTFE liners, ensure safety for the production of active pharmaceutical ingredients. Bianca valves with PFA-coated discs and PTFE liners are recommended for use in highly corrosive, chemical applications.

Valves in this range, with specially-selected conductive disc and liner materials, also conform to the explosion protection directive ATEX 94/9EG, ensuring safe operation in explosive environments.

Notable features of the Bianca series include a high liner collar, a PFA disc over-moulding on the shaft, as well as a life-time pre-loaded safety shaft sealing, ensure reliable primary and long-lasting secondary shaft sealing, even for demanding operating cycles and at high temperatures.

The chambered liner prevents cold flow at the flange sealing surface for increased service life and the PTFE liner, in combination with the PFA-overmoulded disc, ensures low friction, thus longer life of the system. Other features include an external shaft sealing mechanism to protect the valve neck hole and a robust self-lubricating and maintenance-free bushing. A stainless steel valve label enables full traceability.

BMG stocks a wide range of semi-finished components to offer short delivery times, even on large sizes of the Bianca series up to DN 900.

Typical applications for Bianca butterfly valves are in mining and slurries for the extraction of acids and solvents; for the processing of additives in the oil and gas sector and for highly corrosive processes in the steel industry. This series is also suitable for use in water treatment where the smallest impurities need to be avoided.

Safe regulation of liquids and gases
BMG’s multi-purpose InterApp Desponia and Desponia Plus centric butterfly valves, with a tough body and robust elastomer liners, are designed for safe and reliable regulation of liquids and gases in diverse sectors.

Desponia valves, which are available in sizes from DN 25 to DN 1600 and pressures up to 16 bar, are suitable for various industrial applications. This range can be supplied with a cast iron and ductile iron body.

The Desponia Plus range comes in sizes between DN 25 and DN 600, with high-pressure applications up to 20 bar and is suitable for high-temperature or vacuum applications, as well as process automation. This range is available with a body made of ductile iron, cast iron or stainless steel.

The liners and discs of this series play a crucial role in elastomer-lined butterfly valves, as they are the only two parts that are in contact with the fluid. FlucaSt® liners are suitable for abrasive applications and also meet FDA and EU regulations.

Notable features of this range include an external shaft sealing mechanism which protects the valve neck hole and a long neck design that allows pipe insulation. A retaining washer offers blow-out protection and O-rings that are built in the shaft passage, form part of the reliable shaft sealing system.

Sealing lips on the flange face offer perfect tightness and the optimised liner shape ensures a precise grip to the body. The square driven disc offers effective and durable torque transmission and polished disc edges minimise friction.

The Desponia range ensures safe operation in water treatment processes, as well as in power generation and for demanding chemical processing applications. These valves can also withstand operation in the steel industry, where shut-off valves used to gas molten steel, are exposed to harsh conditions. These valves, with specially-coated discs, are also suitable for mining and slurries, for use in extraction processes which require valves with the highest abrasion and corrosion-resistance.

For more information contact
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Large anti-surge control valves from ARCA

Arca supplies its extensive range of valves to nearly all types of industries, but an important part of the product range are valves for turbines and turbo compressors, especially anti-surge control valves. Arca manufactures its Ecotrol series of valves Type 8C/6N/6H and 130, from DN50 to DN700 in pressure class PN10 / ANSI150 up to PN400 / ANSI2500.

Recently, valves of a nominal width of 600 mm have been delivered to several customers. In recent years the design of these valves has been further optimised in order to fulfil the requirements of the customer. Be it large valves for single-axle compressors or multistage high pressure valves for multistage gearbox compressors, Arca has a valve for every application, including hot-gas compressors or cryogen plants, or even for acid gas and oxygen.

Arca not only manufactures all types of valves, but also a wide range of pneumatic actuators for special requirements are now offered. For extreme operating conditions, the actuators of the series 811/812/814 and MA60 guarantee a steady control mode and, in the case of an incident, move extremely fast into the safety position. By means of cleverly devised component parts, large valves can open fast regulated, and, on the other hand, close slow regulated, as appropriate to customer requirements. A fast opening on a large valve is possible in less than 1 second. Ecotrol valves can be supplied with component parts suitable for installation in Ex zones and in all climatic conditions, as well as special versions for mounting in process gas plants, where the process gas is used in food processing.

For more information contact Valve & Automation, +27 31 579 2593, sales@valve.co.za, www.valve.co.za
AVK helps water industry meet local content

AVK Valves Southern Africa is helping key players in the water and wastewater treatment sectors comply with the Department of Trade and Industry’s requirements for local content. Since 2016, following a R300 million local investment drive that included the acquisition of Premier Valves, Gunric Valves and Cementation Engineering, as well as upgrades of its local manufacturing facilities that now manufacture various AVK products previously imported from Denmark, AVK Southern Africa offers a local content specification programme of 84%. This far exceeds the DTI’s local content designation for valve products and actuators of 70%.

This means that state-owned enterprises, municipalities and other users in the water treatment industry have complete access to leading internationally accredited valve technologies, while simultaneously being able to advance their compliance with local content requirements.

The offering includes a complete portfolio of AVK, Premier Valves, Gunric Valves, IPV and Baker Control Valves for plant works, distribution and transmission in the water treatment industry, and for collection, outlet and treatment systems in wastewater applications.

“We feel that there are further opportunities to grow local industry and increase sustainability by creating business for the local foundries and supply chain, which will further advance job creation and enterprise development,” explains AVK Valves Southern Africa Group managing director, Patrick Jantjies.

Supporting skills development in South Africa

Aligned with South Africa’s skills development strategy and development initiatives, AVK Southern Africa offers ECSA accredited valve training courses. In addition to in-house training of its local workforce, the AVK Training Academy has now certified over 700 engineers, distributors and students.

Developing the export markets

The company supports the South African Government’s export programme by actively developing export opportunities for its locally manufactured Gunric Valves and Premier Valves brands through the AVK International Infrastructure network. The two-day training course consists of two parts, the Valves Fundamentals Course and the Advanced Valves Course, which each contribute 2 CPD points.

By investing in modern, lean production layouts, engineering processes, state-of-the-art machinery and improved manufacturing expertise AVK Southern Africa supplies proven valve technologies to the water industry that simultaneously meet the DTI’s policy objectives of reindustrialising South Africa.

For more information contact Sayuri Naidoo, AVK Southern Africa, +27 11 908 3760, sayuri@avkvalves.co.za, www.avkvalves.com
The importance of surge protection in the lightning protection arena

In order to understand the need for surge protection, it is important to understand how lightning causes damage. The sources of lightning damage can be quite different, therefore different protection techniques may be required to protect different items.

There are two areas of concern when evaluating a building or structure, namely the structure itself, and all incoming cables, meaning IT equipment as well as power. From this, the four sources of damage are derived, as per the following possibilities:

- Having a lightning strike directly to the building.
- A strike near the building.
- A strike directly to an incoming line.
- A strike near the incoming line.

Nearby strikes cause surges: in striking neighbouring buildings, surrounding objects or areas next to incoming lines, the lightning current coming down generates a magnetic field, which is cast over the structure or lines. This magnetic field generates an induced current on the incoming line, or on cables inside the structure. To prevent resulting damage to electrical equipment, surge protective devices (SPD) are recommended to reduce the induced effects of lightning. To prevent burning or mechanical damage, lightning rods are installed, also known as external lightning protection.

By installing external protection, users protect against structural damage, but this will not necessarily prevent electronic equipment from being damaged (for example TVs, Internet routers and appliances such as kettles, fridges, microwaves and so on). Therefore, in order to protect equipment, surge protective devices are needed as well.

The calculation from the SANS 62305-2 standard to evaluate the risks are as follows:

- The area to be considered for direct strikes is a radius around the structure, which is three times the height of the structure.
- The area to be considered for surges is a radius of 500 metres around the structure, and can be up to two kilometres away in both directions for incoming lines.

The risk of resultant surges therefore exceeds that of direct lightning strikes, meaning that the correct installation of surge protection devices is extremely important. Other benefits of surge arresters include the minimising of switching surges coming from the grid. This is a relevant topic when seen against the background of recent load shedding from the South African grid.

Over the years, DEHN has developed numerous market-leading surge arresters, with the latest offering being the new DEHNguard ACI surge protective device. This surge arrester with ACI technology allows users to save space, time and costs. It is a prewired, unit that consists of a base part and plug-in protection modules. Its benefits include:

- Safe dimensioning and the elimination of mistakes: The new switch/spark gap combination is integrated directly into, and ideally adjusted to, the arrester. A connection cross-section of just 6 square millimetres makes for easier installation and saves time that otherwise needs to be spent dimensioning the cross-section.
- Being able to withstand temporary over-voltages (TOV) increases system availability and saves on maintenance and repair costs. TOV caused, for example, by loss of neutral, can destroy conventional surge protective devices. The new ACI arrestors have a much better TOV withstand.
- Zero leakage current increases the service lifetime of arrestors. ACI arrestors also avert the accidental tripping of the insulation monitoring and contribute towards operational safety.

For more information contact DEHN Protection South Africa, +27 11 704 1487, info@dehn-africa.com, www.dehn-africa.co.za

DIN rail redundancy power modules

RS Components has announced availability of a new series of DIN rail-mount redundancy power modules from TDK-Lambda, a group company of TDK corporation and a leading maker of highly reliable power supplies for industrial equipment worldwide.

Designed for automation and general-purpose industrial applications, the DRM40 and DRM40B power modules offer 20 to 40 A current handling capability and can be used in N+1 redundancy systems and applications; alternatively, two supplies can be placed in parallel for additional power.

A key feature of the higher-end DRM40 unit is a current-balancing LED indicator, which turns on when two power supplies have been adjusted to deliver the same current, thereby making it easier to ensure load sharing. In addition, two isolated alarm signals indicate the output voltage status of each power supply, making it simple to enable remote fault monitoring. However, a lower cost unit – the DRM40B – is also available for applications not demanding these advanced features.

Designed to take up less space on the DIN rail, the DRM40 series comes in a highly compact unit with dimensions of only 35 x 125 x 124 mm. Offering an operating temperature range of –40 to 70°C, key electrical characteristics include an internal voltage drop of only 200 mV at 40 A, enabling low power loss, a wide input voltage range of 10 to 30 V, and maximum input current of 20 A on each of the unit’s two inputs, plus a peak input capability of 2 x 30 A for 4 seconds.

For more information contact RS Components SA, +27 11 691 9300, sales.za@rs-components.com, www.rsonline.co.za
Using Fluke’s T6 electrical testers

Those who use electrical testers to capture measurements such as voltage and current know that the process is traditionally time-consuming and carries potential risk. Fluke T6 electrical testers provide a faster and safer method for taking electrical readings on distribution panels and junction boxes, among other applications. These tools sense an electrical field in the open fork, allowing users to take the measurement with ease.

Thanks to FieldSense technology, the T6 makes work safer as users can measure voltages up to 1000 VAC through its open fork. Having the capability to measure voltage and current at the same time, together with eliminating the need to open covers or remove wire nuts, allows for faster and more efficient measurement taking. In addition, the open fork can measure wires up to AWG 4/0 carrying as much as 200 A.

Principle of operation

Typically, electricians encounter junction boxes crowded with wires, so finding the right connection point poses a challenge. With the T6-600 or T6-1000 measurements are taken by sliding a single conducting wire into the open fork. Having the capability to measure voltage and current at the same time, together with eliminating the need to open covers or remove wire nuts, allows for faster and more efficient measurement taking. In addition, the open fork can measure wires up to AWG 4/0 carrying as much as 200 A.

FieldSense technology allows the T6 to measure AC voltage, current and frequency without making electrical contact to live voltage. Note that this requires a capacitive path to ground through the user by contacting the round touch point on the back of the battery cover – this will be adequate in many applications. In some applications where a user does not have a clear path to ground, a ground connection via the attached test lead may be required.

Notwithstanding the T6’s improvements to safely taking electrical measurements, workers should still wear appropriate personal protective equipment (PPE). This means electricians should still wear arc-rated clothing and protective equipment including gloves, safety glasses or goggles, hearing protection and leather footwear. In lower voltage areas, measurements can be taken wearing minimal PPE, however, measuring without test leads does not mean wearing the required PPE can be skipped.

For more information contact Comtest, +27 10 595 1821, sales@comtest.co.za, www.comtest.co.za

Power measurement from sensor to cloud

With the new SCT current converters, Beckhoff completes the power measurement chain that now ranges from measuring the physical value to transmitting the captured data to the cloud. The portfolio of current transformers covers all applications for currents ranging from 1 to 5000 A with a choice of ring-type and split-core devices as well as 3-phase current transformer sets.

With its SCT current transformers, Beckhoff makes it possible to implement reliable power sensor technology directly in the field as an integrated component of the PC-based control technology. Users can select from two device types, each available in various designs and performance categories that are highly scalable and therefore suitable for a great variety of applications. The SCT portfolio is extremely broad, ranging from low-cost 3-phase CT sets for building technology and standard industrial transformers for machines through to solutions for inspection and test stands with extra-high accuracy requirements.

The choice of product category depends on the type of use. While ring-type transformers are predestined for cost-effective and accurate data acquisition in new installations, the easy-to-install split-core CTs provide the ideal solution for trouble-free retrofit solutions. With either solution, the integrated power measurement chain from the sensor to the cloud simplifies energy management and opens the door to improving the availability of machines and systems. Continuous, system-integrated power measurement allows users to perform extensive inline analyses, for example, to detect deviations early in time and take quick corrective action in order to minimise downtime.

For more information contact Michelle Murphy, Beckhoff Automation, +27 11 795 2898, michellem@beckhoff.com, www.beckhoff.co.za
Solar plant monitoring and control

The power industry is now ready for clean power such as solar energy. Utility-scale solar power stations with electric power capacity of more than 50 MW and the capability to feed excess power back to the electric grid for future consumption, are being built to meet the growing demand for solar power.

A utility-scale solar power plant can consist of hundreds to thousands of solar collectors. Plant operators need to collect and process data from numerous devices located at remote sites to achieve high energy efficiency. System requirements include:

- Industrial-grade embedded edge computer for remote monitoring, data acquisition, data logging, and protocol conversion of inverter data to monitor solar panel effectiveness.
- Low power consumption to maximise the electrical output of a solar power plant.
- Reliable operation in wide-temperature outdoor environments.
- Web-based remote monitoring of solar array performance, battery load, and environmental data from sensors.
- Sunlight-readable HMI for inverter control.

The Moxa solution

- Rugged fanless UC-8100-ME-T and UC-5100 IIoT gateways with wide -40 to 70°C operating temperature range.
- Multiple I/O UC-5100 IIoT gateway to directly connect with sensors.
- Ready-to-run ThingsPro software solution for Modbus data acquisition and Modbus-to-MQTT protocol conversion.
- 1000-nit sunlight-readable MPC-2070 HMI panel computer.

Siemens updates frequency converter portfolio

With numerous innovations, Siemens has extended its drive portfolio, improving user-friendliness and offering space-saving installation options. The Sinamics G120X converter, designed specifically for use in water/wastewater applications and in HVAC systems, is now also available in a three-phase 3 A 200 V variant in the power range up to 55 kW. This means that the converters can now be integrated seamlessly into applications in the US and in Latin America. Due to its robust construction and the coating of the PCBs according to 3C3 standard the converter is suitable for harsh environments. The new module for extending the digital and analog inputs and outputs increases the flexibility and the optimal control of converter-guided applications. The Sinamics G120X now also supports the communication protocols Profinet, Modbus RTU, USS and BACnet MS/TP. It is equipped with extensive interfaces and can be easily integrated into existing or new systems.

The Sinamics G120 modular frequency converter combines with the Sinamics control unit adaptor kit CUA20 to provide an option for simple and flexible cabinet design. The adaptor kit supports DNV GL-certified cabinet designs. Power modules and the control unit can be separated physically and thermally, making the converter even more flexible and customisable.

A new Sinamics V20 converter size has been added in the 2.2 kW to 3 kW power range. The 32 percent smaller size FSAD with cabinet dimensions of 176.5 x 136.6 x 158 mm makes the Sinamics V20 an even more flexible and space-saving solution.

For more information contact Jennifer Naidoo, Siemens Digital Industries, +27 11 652 2795, jennifer.naidoo@siemens.com, www.siemens.co.za
The recent slew of distributed denial of service (DDoS) attacks against South African banks and ISPs have highlighted the fact that even the largest organisations with the latest security tools and solutions need to revisit their technology governance strategies.

“These attacks should be a wake-up call to organisations across the board,” says Rezelde Botha, business unit manager for Citrix at Axiz.

A DDoS attack happens when threat actors attempt to make it impossible for a company to deliver its services, usually achieved by preventing access to networks, applications, servers, devices and suchlike. Essentially, these attacks work by flooding a system with requests for data, such that it inevitably crashes under the onslaught. Also, DDoS attacks are not just on the rise, they are changing in nature. It would seem that new DDoS attack methods are taking over from those that have been successfully combated by the security community and law enforcement. Unfortunately, they are becoming increasingly complex and this is showing no signs of slowing down, therefore, businesses must find ways to protect themselves effectively.

Botha says the impact of a DDoS attack can range from a minor irritation to seeing websites, applications, or even the whole business taken offline. There are several symptoms that indicate a DDoS attack, although initially, it can appear as if there are normal availability issues, such as a server or system being down. Sometimes, it can seem as if there are simply too many legitimate requests from real users taking place. However, traffic analysis will quickly separate the wheat from the chaff.

### DDoS attacks are becoming more aggressive

Over the years, DDoS attacks have got bigger in size. “If we think back to the ‘90s,” Botha explains, “attacks might have seen 150 server requests happening each second, and that number would have been sufficient to bring down systems at that time. Today, they can exceed 1000 Gbps, thanks to the massive botnets we see today.”

Three years ago, the notorious Mirai botnet reared its head, attacking Internet performance management company, Dyn DNS. Mirai employed a hundred thousand hijacked IoT devices to achieve its ends, sending a barrage of DNS queries from an enormous number of different IP addresses. “This led to services from giants such as Netflix, Amazon, Spotify, Tumbler and Twitter being disrupted, explains Botha. “The Mirai botnet was notable in that, unlike the majority of DDoS attacks, it leveraged vulnerable IoT devices instead of PCs and servers. This is particularly concerning considering the number of IoT devices already in play, and growing exponentially.”

Early last year, another DDoS technique appeared on the scene. “Software development platform GitHub was hit by an enormous DDoS attack. The platform managed to fight it off in under half an hour, only going down intermittently, but the sheer scale of the attack raised the alarm within the security community.

Botha explains that this attack did not make use of massive botnets, such as those used in the Dyn DNS attack, it employed a far simpler method. This attack stemmed from memcached servers. “Essentially, these database caching systems work to quicken networks and websites,” she adds, “but they aren’t meant to be exposed on the public Internet. Approximately 100 000 such memcached servers, most of which are owned by businesses and other organisations, sit exposed online with zero authentication protection. Anyone can query them, and similarly, they will respond to anyone.”

In this way, threat actors can access them and send them a special command packet that the server will respond to with a much larger reply. Unlike the usual botnet attacks, memcached DDoS attacks do not need the power of a malware-driven botnet to achieve their ends. Bad actors merely spoof the IP address of their target and send small queries to multiple memcached servers, at around 10 per second to each server, which are tailored to draw a far larger response. These memcached systems then return fifty times the data of the requests back to the victim.

“One thing is clear,” concludes Botha. “Businesses need to find better ways to protect themselves against this sort of attack.” Enter Citrix NetScaler, which checks the client’s connection and request parameters to prevent flood attacks until a valid application request has been submitted. Using NetScaler, businesses can defend against attacks through security products that use the latest standards to protect today’s segmented, layered and virtualised corporate networks.

For more information contact Evette Wessels, Axiz, +27 11 237 7000, evette.wessels@axiz.com, www.axiz.com

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Siemens Industrial Edge takes cloud processing benefits to the field

With Industrial Edge, Siemens offers users the opportunity to close the gap between conventional local and cloud-based data processing, depending on individual requirements. With edge computing, large volumes of data can be processed locally almost in real time. Siemens provides users with a broad spectrum of applications for this, including data processing, data visualisation via web server, data transmission to the Cloud or IT infrastructure and fast innovation cycles for app development. In addition, storage and transmission costs are reduced for users because large volumes of data are preprocessed, and only relevant data is then transmitted to a cloud or IT infrastructure. Siemens Industrial Edge supports cloud transmission protocols for Mindsphere, the open, cloud-based operating system from Siemens as well as Message Queuing Telemetry Transport (MQTT). This makes data transmission secure and effective.

Via the Edge Management System, users can install software apps from the Edge App Store of the backend system, e.g. Mindsphere, on the desired Edge devices. Edge devices are equipped with Edge Runtime software, which guarantees connectivity both for data capture from the connected automation and for Edge Management and which features a driver toolbox for accessing device functions. Edge Runtime software also ensures a protected app environment for executing functions on Edge devices. Edge apps for Siemens Industrial Edge are provided both by Siemens and by third-party providers. It is also possible for users to develop their own Edge apps tailored to their individual requirements.

Siemens Industrial Edge: management, devices and apps
Siemens Industrial Edge comprises the Industrial Edge Management System, Edge devices and Edge apps. The management system can be used to manage all connected Edge devices centrally and to monitor their condition. In addition, Edge apps are always distributed to Industrial Edge devices efficiently and securely in the latest version. Applications can be installed on Edge devices regardless of the machine operating state without adverse effects. Apps for Siemens Industrial Edge can be provided both by Siemens and by third-party providers. This means that users and machine builders also have the opportunity to develop their own applications, which are tailored to the individual requirements of their machines.

With the acquisition of US startup Pixeom, Siemens has obtained components for Edge Runtime for apps as well as for Device Management as part of the Siemens Industrial Edge ecosystem. The technology developed by Pixeom based on the Docker IT standard offers open interfaces e.g. for connection to the Mindsphere App Store, for the management of third-party hardware and for the creation of apps by Siemens customers. Apps are offered via a marketplace in Mindsphere, while the operating system of Siemens Industrial Edge is integrated in a universal security concept. This enables the stable operation of one or more apps in parallel and also ensures a protected software environment for the execution of applications on Edge devices.

Maximum flexibility and productivity across the entire plant life cycle
Industrial Edge with Simatic offers Siemens users a platform that can meet the challenges of today and tomorrow. Automation components such as Simatic controllers are additionally supported by Edge devices, enabling larger volumes of plant data to be processed profitably and providing vital information for the continuous improvement of productivity. At the same time, new applications such as condition monitoring or predictive maintenance are gaining ground in conventional automation technology. Furthermore, Edge computing offers a previously unattainable level of flexibility: plants can be kept up to date at all times via functional, feedback-free updates even for the plant life cycles expected in automation. Siemens users are supported in application development with frameworks and access to integrated connectivity with the world of automation.

Stable processes and increased productivity for machine tools
For machine tools, Industrial Edge with Sinumerik provides a machine-based platform for software apps, which captures, preprocesses and analyses high-frequency data from the machine tool. In addition, complex tool paths can be calculated, and non-productive times or work area monitoring can be optimised. With Sinumerik Edge, Siemens enables machine tool users to improve workpiece and process quality, to increase machine availability and to further optimise machine processes.

For more information contact Jennifer Naidoo, Siemens Digital Industries, +27 11 652 2795, jennifer.naidoo@siemens.com, www.siemens.co.za
End-to-end supply chain visibility and analytics now a reality

Line of sight is a challenge for many supply chain aspects, from the manufacturer to the wholesaler, distributor and the reseller, and even the end consumer. This lack of visibility and control results in a number of issues, from stock losses to pricing inflation, uncertain availability and increased time to market. Forecasting and trend reporting are also all but impossible, since a complete view of the supply chain cannot be obtained. The ultimate goal for maximum efficiency and visibility is an integrated value chain where all systems communicate seamlessly. This delivers end-to-end insight and finally makes predictive analytics on the supply chain a reality.

**Paper-based processes cause delays**

Delays are arguably one of the biggest supply chain challenges. Paper-based processes are a significant component of this issue. When orders, delivery notes and invoices are generated, due to lack of visibility into stock levels available, what is ordered and what is actually delivered may differ. This means that the invoice then needs to be amended on delivery. Credit notes must be passed, or new invoices generated, creating additional timelines and complexities. This can also lead to inaccurate billing, loss of stock, loss of income and other financial effects. A live view of stock levels and the ability to generate an accurate invoice on delivery will mitigate these challenges, minimise delays and improve the accuracy of orders, billing and payments received.

The inefficiency of processes and the reliance on paper-based processes means players in the supply chain cannot manage what is actually being ordered and paid for. It is impossible to collect the correct payment on orders if there is no visibility into what orders have been placed and actually delivered. This could, and often does, lead to significant loss. In addition, FMCG goods are easily stolen and readily convertible to cash. Without visibility into orders placed and delivered it is impossible to know if stock is being stolen. All of these issues are difficult to identify and quantify without live or real-time information and insight.

**Governance challenges**

The lack of visibility into stock levels leads to governance challenges, since there is no transparency in the process. The ability to manage stock levels, receipts issued and cash collected is key, and players in the supply chain need a full view of stock in, stock out, payments collected, invoices issued and more. Governance across all of these touchpoints is critical for a profitable business, which requires integrated systems and line of sight across the entire supply chain from start to finish.

A further challenge for parties in the supply chain is the inability to influence consumer behaviour. To ensure maximum success and profitability it is necessary to engage retailers and consumers using loyalty, rewards programmes and incentives. This requires an end-to-end ecosystem to link the manufacturer to the consumer and the consumer back to the manufacturer. This last mile is essential to fully deliver a transparent supply chain.

**End-to-end visibility from manufacturer to consumer**

Addressing these challenges requires an integrated, mobility and cloud-based system that delivers the required visibility across the supply chain. An ecosystem that delivers a direct ordering platform between the distributor and the manufacturer, with real-time stock levels and online ordering capability, can dramatically increase efficiency at the first stage. Distributors can better manage their stock levels, warehousing and personnel, and stock can be tracked at any point no matter where in its journey it is.

Distributors are empowered to generate clean invoices on delivery and deliver accurate orders to retailers because they have visibility into manufacturers. Retailers have visibility and only need to pay for what they ordered and actually received. The need for credit notes to be passed is all but eliminated. Debtors and creditors can be incorporated into the ecosystem for enhanced financial management. In addition, the loop can be closed to include loyalty programmes and activations, giving full line of sight.

Armed with this data, manufacturers, distributors and retailers will be able to make use of intelligent dashboards to interpret data against key performance indicators and deliver real-time actionable insight. Structured reports can be pulled at any time, and automatic alerts can be configured if any exceptions occur. This enables real-time business management. Digital transformation of the supply chain will also enable data to be utilised for predictive analytics, enabling more agile and effective decision-making across the board.

For more information contact Lindsay Britz, MACmobile, +27 12 665 0601, lindsay@macmobile.co.za, www.macmobile.co.za
Whenever the flow of gases needs to be adjusted or monitored, Kobold’s model UTS variable area flowmeter for monitoring gas burners offers a solution. This compact measuring instrument can be placed at various locations, precisely where required. Recently, the company was tasked with optimising gas burner production line monitoring in order to achieve a ‘No Product Rejection’ status.

The task
Lighting machine manufacturers generally require several small and one large annual maintenance session on their production lines. This means shutting down (completely dismantling) the production lines. All failures to be fixed, broken or worn parts replaced, burners and valves refurbished and production lines reassembled.

It is only after such maintenance, that production restarts. Each production phase of the renewed line must be resynchronised, each burner reset at the correct temperature and the entire production process adjusted in order to manufacture the highest quality product. This requires not only precision but is time consuming and involves a significant quantity of reject product. The time consumed and the wasted goods cost money, which may result in a serious competitive disadvantage in the market.

**Kobold’s UTS solution:**
Production lines are equipped with UTS type variable area flowmeters: one built into each gas circuit for burner control. Retrofitting of machines without major modification, even with 10-20 flowmeters, is easy due to UTS’s compact design and small footprint. When a production line produces a perfect product, the process values are recorded. Following the next shutdown, and before starting, all burners are set up to the recorded values. It takes only a few seconds then to set each burner for optimal operation. Production can then be restarted in a short time and the quality of first finished product is always perfect. Total investment is returned after only a few maintenance cycles. Other typical examples include monitoring engines and the supply of laboratory equipment with different gases.

**For more information contact Instrotech,**
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**Sonic industrial imager detects leaks**

Comtest now offers the Fluke’s ii900, a handheld sonic industrial imager that enables maintenance teams to locate air, steam, gas and vacuum leaks in systems. The straightforward, intuitive interface allows technicians to isolate the sound frequency of the leak and filter out background noise. In a matter of hours, the team can inspect the entire plant, even during peak operations.

Using SoundSight technology, this industrial imager offers a new way to locate issues using sound. Leak identification is simple, a SoundMap is displayed in colour over an image of the equipment allowing for fast visual location. With the image, it is easy to scan a large area quickly and even identify leaks from a distance.

The Fluke ii900 finds application in the following industries: manufacturing: automotive, glass plastics, mining, cement, food and beverage, and pulp and paper. The instrument enables users to do more with existing air compressors, for example:
- Delays the capital expense of purchasing an additional compressor.
- Ensures proper air pressure to pneumatic equipment.
- Lower energy costs (optimisation of compressed air budget).
- Reduces leak detection time.
- Improves reliability on the production line.

The imager makes leak detection part of a typical maintenance routine, for example, the training of a maintenance team is possible in a matter of minutes and provides for the validation of repairs.

Finally, it is specifically designed for industrial maintenance teams, maintenance leads, plant maintenance managers and plant operations managers, who rely on compressed air, gas or vacuum in their routine operations. With minimal training, technicians can begin checking for air leaks as part of their typical maintenance routine. The ii900 provides a better way to check compressed air leaks, and at the same time conduct gas and vacuum leak identification.

**For more information contact Comtest,** +27 10 595 1821, sales@comtest.co.za, www.comtest.co.za
Emerson has introduced the AMS Wireless Vibration Monitor, a low-cost, easy to deploy vibration sensor that performs prescriptive analytics on vibration data using native software to automatically identify failure modes and prevent potential problems involving rotating assets. The new compact device makes it economically feasible to fully monitor motors, pumps, fans and other critical plant equipment to reduce downtime and achieve more reliable operations.

Many organisations lack the analysis expertise to translate vibration data into asset health. The AMS Wireless Vibration Monitor provides a solution by collecting and contextualising vibration data to generate actionable information. By applying Emerson’s patented PeakVue Plus technology, the device not only identifies when and how assets will fail, but also why. Technicians – regardless of expertise – can quickly and clearly identify and prioritise common mechanical issues such as bearing defects, gear wear, under-lubrication and pump cavitation, enabling them to focus more on operations-critical tasks.

“Thanks to the embedded prescriptive analytics, plant managers can add wireless vibration monitoring to their maintenance toolbox without having to train current staff to perform complex analysis,” said Robert Skeirik, director of machinery health solutions product management with Emerson’s Automation Solutions business.

Users of Emerson’s Plantweb Optics asset performance platform allows can conveniently receive machinery health alerts anywhere with a mobile device. These alerts can also be aggregated with data and asset health information from other sensors and systems, allowing users to run analytics on all types of assets from a single application. This provides a more complete picture of the operation’s overall health while generating specific alerts when processes or performance are at risk. Plantweb Optics is part of Emerson’s Plantweb digital ecosystem, which leverages IIoT technologies, software, and services to expand digital intelligence throughout a workforce.

The AMS Wireless Vibration Monitor operates on a plant’s existing WirelessHART network and fully supports the vibration analysis tools included in Emerson’s AMS Machine Works software. It uses a triaxial sensor to capture data in three dimensions to generate a complete picture of the machine condition.

The AMS Wireless Vibration Monitor is the latest addition to Emerson’s comprehensive health monitoring portfolio, which includes the AMS Asset Monitor and AMS 6500 ATG. Together, these devices help organisations fully monitor the health of machinery equipment, from essential assets to operations-critical assets that can have immediate impact on safety and production.

For more information contact Devesh Roopnarain, Emerson Automation Solutions, +27 11 451 3700, devesh.roopnarain@emerson.com, www.emerson.com
Technology trends to follow for 2020

By Craig Resnick and Paul Miller, ARC Advisory Group.

Industrial end users today are demonstrating an improved grasp on how disruptive technologies and approaches can be implemented effectively in their operations and across their enterprises to gain business value. This is critical for any organisation to not only survive, but to thrive long-term in a world where the only certainty is change.

The new technologies and approaches that ARC Advisory Group analysts are tracking are all poised to either enter the mainstream or – if already there – to continue to gain acceptance. All relate to the overall digital transformation of industry, infrastructure, and today’s increasingly smart cities and municipalities. While far from a complete list, the technologies discussed in this report will almost certainly make an impact on industry, infrastructure, and municipalities in 2020.

Deploying IIoT Edge 2.0 solutions

The edge of industrial Internet-enabled architectures is becoming increasingly important. This is due largely to its often-critical role in determining the success of digital transformation strategies. Initially focused on delivering timely, clean data to cloud-based applications, the edge is emerging as an entirely new ecosystem within the overall enterprise architecture. Solution architects now rely on the edge not only for cloud integration, but also as a solution to address manufacturers’ concerns about latency, security, cost containment, and isolation for production environments.

Edge computing applications, particularly high-value analytics and artificial intelligence (AI) delivered via machine learning (ML), allow data to be processed near its source. The spike of investments targeted at this space helps demonstrate its increasing importance. IT and OT suppliers alike are introducing new IIoT edge hardware, software, and solution offerings. ARC now refers to this as ‘Industrial IoT Edge 2.0.’ It offers important improvements in ease-of-use, self-service, and turnkey operation; while emphasizing business outcomes and application-specific solutions versus pervasive infrastructure. Moving forward, Industrial IoT Edge 2.0 offerings will place greater emphasis on turnkey solutions that address specific outcome-oriented use cases. This represents a shift away from a simple ‘run the operations’ mentality to use of realtime data analytics to rethink competitive fundamentals.

Increasing use of cyber-physical systems

While manufacturers ramp up to meet demand for the growing ‘smart product’ market, they face challenges developing and manufacturing new and more complex products and systems. These require tight integration between the computational (virtual) and the physical (continuous) worlds. To meet these complex and integration requirements, more cyber-physical systems will be deployed using advanced simulation platforms that cover model-based mechatronic systems engineering, embedded system design integration, and simulation models that validate product and system design in the physical world.

Cyber-physical systems are an engineered system or mechanism controlled or monitored by computer-based algorithms and tightly integrated with both the Internet and its users. In cyber-physical systems, physical and software components are deeply intertwined and get much of their intelligence from the use of AI and ML. Factory production lines, process plants for energy and utilities, and smart cities will depend on cyber-physical systems to self-monitor; optimise; and even run infrastructure, transportation, and buildings autonomously.

In the future, cyber-physical systems will rely less on human control and more on the intelligence embedded in the AI-enabled core processors. These will run the devices, products, and systems that will be a pervasive part of the industrial world that produces them.

Accelerating development of Open Process Automation Systems and related standards

Advances in hardware, software, networking and security, increasing global competition and cybersecurity risks, and the need to gain
more value from automation technology will accelerate the development of open process automation systems and related standards.

For example, one initiative being driven by a collaboration of end users, including ExxonMobil, Aramco, BASF, ConocoPhilips, Dow, Georgia-Pacific, and Linde. These companies are members of the Open Process Automation Forum (OPAF) established by The Open Group to identify and select appropriate standards for technology and systems to support interoperability, avoid technology obsolescence, and deliver more business value.

The goal of this collaboration is to accelerate creation of a standards-based, open, interoperable, and secure automation architecture that addresses both technical and commercial challenges of current systems.

A recently developed test bed for use by the collaboration partners will act as the foundation for testing the performance and operation of individual components and standards. The collaboration partners will nominate and prioritise new components, standards, and system features to be added and tested. The results from the test bed will be shared with all collaboration partners and create a foundation for developing future solutions.

At the asset/application level, a parallel (and potentially converging) end user-driven effort, the NAMUR Open Architecture (NOA) standard for transferring field equipment information, continues to gain traction in Europe and elsewhere. NOA uses a standardised information model to securely transfer field data from within the control system to cloud or on-premise applications for monitoring and optimisation (M+O) purposes.

The main purpose of NOA is to reduce the cost and effort required to integrate M+O applications while safeguarding real-time, deterministic process control and instrumentation. NOA demonstrates have shown that the principles behind NOA are sound. Proof-of-concept installations show they can be transformed to technical specifications and standards that could lead to marketable products.

**Applying systems engineering practices to industrial cybersecurity**

Ensuring the cybersecurity of information systems and associated networks has always been challenging. Serious vulnerabilities are identified on a regular basis and new threats continue to emerge to exploit those vulnerabilities. Industrial systems share many of the same vulnerabilities and are subject to the same threats. However, the consequences may be very different and, in some cases, more severe. This makes cybersecurity an imperative for the asset owner, who ultimately must bear the consequences of an adverse event.

The threat is ongoing and evolves constantly, so cybersecurity should not be viewed as a one-time ‘project’ with a defined beginning and end. Since there is no such thing as being fully secure, the preferred approach should also be ongoing. This is similar to the approach used for safety, quality, and other performance-based programs. It’s also not sufficient to focus on specific elements. Instead, asset identification and management, patch management, threat assessment, and so on are all parts of a broader response that must address all phases of the life cycle. This response begins by identifying principal roles and assigning responsibilities and accountability for each stage of the system life cycle. With these addressed, the well-established systems engineering discipline can provide effective tools and methods to help define, plan, and conduct the response.

**Digital transformation shifting focus from digitisation to digitalisation technologies**

As part of a natural evolution, digital transformation is shifting its primary focus from basic digitisation to digitalisation. Digitisation focuses on technology and infrastructure and involves creating digital versions of previously analog data, such as replacing paper-based work orders with digital work orders and replacing legacy analog field instrumentation and control systems with digital technologies.

Digitalisation, in contrast, involves using digital data and technologies to improve business or work processes: for example, utilising data from a digital work order to improve maintenance work processes and execution, or using digital twins to improve asset information and/or engineering processes. Digitalisation can improve the way people work, collaborate, and get things done within a plant, across a company, or across the entire value chain. Examples would include using digital twins to support engineering, augmented reality (AR) for assembly and maintenance, and virtual reality (VR) for training and simulation.

Successful digital transformation involves both digitisation and digitalisation. Digitisation makes it easier to capture, organise, and manage a variety of data, while digitalisation enables organisations to gain tangible business value from those data. Digitalisation focuses on multi-process disruptive change and how to implement these throughout an organisation. It engages an entire company and its people, rather than just processes and data.

**Digital Transformation Council provides opportunities to learn from peer organisations**

Thanks to the pioneering efforts of many of today’s industrial, infrastructure, and smart city-related companies and organisations, we are seeing an increasing number of pilot-level digital transformation projects being launched. This includes projects that utilise the technologies and approaches discussed here. Many leading end user organisations have started to see meaningful and measurable results.

Certainly, embracing newer technologies involves a degree of risk. ARC’s research indicates that many digital transformation projects can fail to produce meaningful business value because either the critical cultural and workforce issues were not addressed in advance or the project team was unable to scale up their pilot-level projects successfully.

To help overcome these and related issues, ARC encourages end users to engage with their peers via the Digital Transformation Council (DTC), a global, member-driven community for professionals in industry, energy, and public-sector organisations on a digital transformation path. DTC members have an opportunity to share their strategies, experiences, and practices to mutually support each other. There is no fee to participate.

*For more information contact Paul Miller, ARC Advisory Group, +1 781 471 1141, pmiller@arcweb.com, www.arcweb.com*
Servo system simplifies sizing

The growing consumer desire for more product variety and packaging sizes is creating a need for smaller, more flexible machines. To provide a more cost-effective option for OEMs building smaller machines, Rockwell Automation is introducing a new Kinetix 5100 servo drive, Kinetix TLP motor and cable, which can function as a system without a controller.

The new Allen-Bradley Kinetix 5100 servo drive has multiple control modes available to support a wider range of high-speed, low-power motion control applications. The drive can be used with a Micro800 controller, a Logix controller or even by itself, allowing OEMs to choose how the product best functions in their applications.

“The Kinetix 5100 servo system works especially well for small- to mid-sized packaging machines that need cost-effective servo control,” said Simon Wong, product manager, Rockwell Automation. “Bundling the drive, motor and cable together creates more competitive system pricing. And the ability for OEMs to select the products based on a machine’s power ratings can save time and effort – and help them get to market faster. This approach and product portfolio positions Rockwell Automation to accelerate our growth in China and emerging markets.”

The Kinetix 5100 servo system can also help OEMs make customers more productive. With the explosion of SKUs, manufacturers are faced with multiple changeovers, which are often a manual process. Using the Kinetix 5100 servo drive, OEMs can create a motorised, or automated, system that can help speed up changeovers.

Additionally, with built-in safe torque off, users can remove motor torque without removing power from an entire machine, allowing a machine to restart faster after it has reached a safe state. Dual-port EtherNet/IP also supports device-level ring topologies. The Kinetix 5100 servo drive provides an easy migration option for users of the Allen-Bradley Ultra 3000 digital servo drive. That system will soon be phased out in favour of the Kinetix 5100 servo drive.

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Collision avoidance and navigation support

From electric lifting trucks and order pickers to tugs and mobile transport platforms, warehouses are benefitting from SICK Automation’s 2D LiDAR sensors. These sensors from the TiM series ensure collision-free manoeuvring and precise measurement data for navigation.

To enable transport and picking vehicles to operate autonomously they must be protected against collisions and equipped with the option for self-navigation. SICK’s TiM 2D LiDAR sensors satisfy requirements for integration capacity, course-plotting and routing, obstacle detection, and cater to safety-related applications.

The sensors in the TiM series are designed for quick and easy plug-and-play integration, with a design that takes shock, vibration resistance and ambient light immunity into account. All 2D LiDAR products feature innovative HDDM technology which enables both mobile and stationary obstacles to be detected. Detection is reliable regardless of material, surface structures, colour or lighting.

The range offers application orientated solutions that meet key device related requirements. The TiM1xx weighs just 90 grams and requires only 2.2W of power. This compact, energy efficient model delivers long, interruption-free operation. The TiM361S is safety-certified in accordance with EN ISO 13849-1:2015 and is the perfect combination of measurement performance and functional safety. Operating in the safety range from 0.05 cm to 4 m, it has up to 48 independent monitoring fields and as many monitoring scenarios and protective field geometries can be set up as needed. The compact TiM5xx has a height of only 86 mm, making it ideal for object detection, position detection and navigation in confined installation spaces with a working range up to 25 m. These are just a few examples from SICK’s wide range of 2D LiDAR scanner options.

The world of autonomous mobile intralogistics requires intelligent sensors that are able to deliver real-time navigational and environmental information to self-driving vehicles, platforms and robots. SICK’s TiM range deliver precision, reliability and the speed to support navigation and position determination data, and consistently avoid collisions.

For more information contact Grant Joyce, SICK Automation Southern Africa, +27 10 060 0558, grant.joyce@sickautomation.co.za, www.sickautomation.co.za
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Tailor-made mobile robotics revolutionise the automotive industry

Automobile manufacture and assembly line production have always been closely linked. It was not until Henry Ford began using conveyor belts in his factories in 1913 that the car was able to conquer the world as a mass-produced product. Today, a working day without assembly lines is inconceivable at the BMW factories. The group relies on innovative transport and logistics to increase efficiency and flexibility, to better link work processes, as well as to relieve employees from repetitive and time-consuming tasks. These concepts include Omron LD mobile robots for material transport that deliver a particularly high return on investment. The interaction between employees and transport robots at BMW impressively demonstrates how factory harmony can be implemented in the factory of the future.

Continuous optimisation of production and logistics processes
Depending on the BMW plant, up to 1600 vehicles are produced each day. With such production volumes, continuous optimisation and efficiency gains through innovative strategies and technologies are essential. This also includes logistics and transport processes in production. Various small and large parts, including components for steering wheel and cockpit assembly, rotatable parts or interior lights for example, must be transported continuously from storage to the assembly line.

“Employees in the production halls were involved in the transport of components for more than 60 percent of their working time,” says Aleksandar Cvetanovic, European key account manager automotive, Omron Industrial Automation. “Merging the different storage and production areas with conveyor belts is impractical, so this step was mostly done manually, which cost valuable capacity.”

Mini Smart Transporters address needs and requirements
BMW factories have utilised an automated and driverless transport system since the 1980s. However, this system is not flexible in its use and is tied to fixed routes via lanes in the form of grooves. BMW needed a robot that could create its own routes and adapt to new processes without having to make major changes to the infrastructure – an advantage over line-guided materials handling.

“At the beginning of the initial project, the first task was to understand and address the customer’s requirements and find out what could be implemented,” adds Cvetanovic. “What’s more, BMW Group Logistics needed a standard for its products and services. The group opted for LD mobile robots from Omron, also known as BMW Mini Smart Transport Robots (miniSTRs), with specially-designed conveyor belt attachments.”

As a system integrator, cts GmbH, a longtime Omron solutions partner, developed a complete solution of LD mobile robots – a conveyor attachment and software that specifically matches the requirements of BMW. The solution combines the Omron Enterprise Manager with the company’s own Enterprise Resource Planning (ERP) system.

cts GmbH has been using Omron products and solutions for years and is currently exploring new opportunities for the use of Autonomous Intelligent Vehicles (AIVs). With over 100 integrated AIVs, it is one of the largest system integrators of this vehicle technology in Europe.

“Developing an overall system based on the Omron LD, which meets the high requirements of a premium manufacturer like BMW, was a challenge that we gratefully accepted,” reports Alfred Pammer, head of factory automation, cts GmbH. “Drawing on our many years of experience with the Omron LD, which is impressively demonstrated in more than 100 successful operating AIV systems, we were able to implement the ideal solution quickly and successfully, together with Omron and BMW. Thanks to our extensive software knowledge and product AIV framework, integration into the IT level of the BMW Group was also easily done.”
Ideal route determined independently
Since 2015, the BMW Group developed the first self-driving Smart Transport Robots (STRs), together with the Fraunhofer Institute, for the transport of roll containers in logistics areas within production halls. The second generation is now in operation at the BMW Group Regensburg plant. The robots carry roll containers weighing up to one ton and transport them autonomously to the destination of the goods. They calculate the ideal route independently and move freely in the area. The new navigation method SLAM (simultaneous localisation and mapping) does not require any permanently installed navigation transmitters in buildings and thus can be used quickly in a new environment. A built-in battery module of the BMW i3 powers the STR for a whole working shift. The delivery of urgent small parts is handled by a smaller version – the miniSTR – based on the Omron LD mobile robot.

Omron convinces with worldwide service and support
"To fully automate the intralogistics and bring together manufacturing automation with Industry 4.0 and digitisation, a solution for material transfer had to be created and job creation developed using the software architecture from the cts AIV framework," explains Cvetanovic. “Our Enterprise Manager fleet management system has a variety of options. The narrow and high design of the solution was also beneficial, as there are quite narrow paths and high equipment in use at the BMW plant. However, the main reason that BMW has opted for Omron was the global service and support. More than a good technical solution alone is needed for a global company like BMW.”

The mobile robots from Omron were first implemented at the Landshut plant, with other production sites such as Munich, Wackersdorf, Berlin, Leipzig, Regensburg, Eisenach and Dingolfing currently being implemented.

Millimetre accurate alignment
Mobile robots such as the Omron LD, in combination with the customisation of cts GmbH, allow significant cost optimisation with barrier-free material supply, combined with a small footprint, thus avoiding the typical downsides of traditional conveyor belts. In addition, the robot can be deployed quickly and flexibly thanks to autonomous routes without forced guidance, such as induction loops. The LD robots move at a speed of up to 1.8 metres per second. Thanks to their optional double sensors, guided by special magnetic strips on the floor, the robots can align themselves with millimetre precision. This additional accuracy makes it possible to accelerate the production processes. Users at BMW also praise the reliability of their robot colleagues.

“As the robots move between cells, they detect people or objects in their way, using their own sensors,” adds Cvetanovic. “They then autonomously manoeuvre around them or stop to let people pass by. For example, the production line operators and maintenance personnel can safely work with LD robots.”

Omron Enterprise Manager adds efficiency
The Omron Enterprise Manager fleet management system ensures that products are transported from one production stage to the next as they become ready. It also ensures that the robots are always charged. Even during hectic times, the robots can be briefly steered into the charging station to give their batteries a boost, as needed. At planned downtimes, all robots are sent to their charging stations. The Enterprise Manager also makes it easy to add attachments to robots. If a new one is added, it does not require additional programming. The Enterprise Manager automatically integrates it into the current inventory and assigns it the appropriate tasks.

In addition to enabling more efficient processes in the production halls, the Omron LD robots bring further benefits: the protection scanners provide the LD 90 with the necessary security against other road users, including both machines and people. The system offers process security, while being easy to operate and integrate. Automating the process also makes it cost-effective.

“Automated material handling without traditional conveyor technology, barrier-free material supply and flexible configuration are becoming increasingly important for future-oriented production processes,” concludes Cvetanovic. “On top of this, there is also a need for simple adjustments to changing production conditions, such as line shifts or plant relocation. BMW is an innovation leader in the automotive sector, including smart logistics, and through our partnership with Omron and cts GmbH, the useful interaction between the robot and factory employees will lead the way for other sectors such as the pharmaceutical industry.”

For more information contact Omron Electronics, +27 11 579 2600, info_sa@omron.com, www.industrial.omron.co.za

Fibre optic transmission of AS-I signals
The new AS-i fibre optic repeater from ifm electronic enables AS-interface signal transmission via an optical medium and vice versa. This allows for considerable cable length extension in the AS-i network.

Every AS-i fibre optic repeater has two independent channels that consist of a transmitting and a receiving element, which are supplied via the AS-interface system. Various LEDs indicate the current operating status. This innovation is integrated into the new SmartLine housing. While conventional repeaters usually have a temperature range from 0-55°C, the new unit from ifm operates reliably across a range from -25-70°C. Another new feature is the integrated passive bus termination.

Performance in the field
Optical transmission means there is no interfering radiation, nor are there any ground problems. Fibre optic transmission systems exclude any EMC risk, as a matter of principle. As to distance related losses due to inductance, capacitance and resistances (as is the case with copper cables for example), they do not occur either. Consequently, the new AS-i fibre optic repeater contributes decisively to lifetime extension and cost reduction.

Using the new AS-i fibre optic repeater allows for additional fibre optic network topologies (line and star).

For more information contact ifm - South Africa, 086 143 6772, info.za@ifm.com, www.ifm.com
Intelligent mechatronic devices

BMG’s range of Danfoss electronic, mechanical and intelligent mechatronic devices includes the VLT AutomationDrive FC 300 series, designed for variable speed control of all asynchronous and permanent magnet motors on most industrial machines or production lines – even in demanding applications and challenging environments.

The Danfoss VLT AutomationDrive FC 300 series, with intelligent drive functions, is based on a flexible and modular design to optimise energy savings, versatility, efficiency and maintenance. This robust drive system, with reduced harmonic impact and a spark-free design, is protected against the negative effects of vibration, moisture and dust and has the flexibility to operate pumps, conveyors, palletisers and material treatment equipment, ensuring optimum control and dependable operation for extended periods.

“The VLT AutomationDrive – which has received global awards for innovation and user-friendly features – reduces project costs, ensuring the lowest possible cost of ownership while maintaining high efficiency processes,” says electronics manager, Mick Baugh. “As with all Danfoss drives, this system is motor independent to offer the flexibility to be able to select the correct motor for specific applications. Danfoss makes an ongoing investment in advanced technologies, to ensure all systems comply with current and future demands in the drives sector. With the implementation of the VLT AutomationDrive into a plant, the BMG team ensures a seamless transition into Industry 4.0.

“The VLT AutomationDrive FC 300 series boasts both hardware and software enhancements that maximise performance and a new Ethernet platform for improved communication. This range also encompasses new generation E-frames and lower temperature ratings.”

This modular and adaptable drive system is suitable for installation in any environment – close to the motor, in electrical panels, switch rooms or outdoors and as stand-alone units in the production area. It has an advanced thermal design and back-channel cooling and is one of the most compact and cost-efficient air-cooled drives in the range of 90 kW to 800 kW at 500 V. The robust and intelligent system has been designed to simplify every step in the installation process, including wiring, programming and operation.

The VLT AutomationDrive, which is compatible with leading motor and fieldbus technologies, offers web-based configuration, Electronic Data Interchange (EDI) and access to drawing and engineering diagrams. The system also provides tools for harmonic and motor-drive system efficiency calculations. There is a flexible interface to the drive data from multiple access points, including directly at the drive, via mobile applications, through an integrated web server and via cloud connectivity.

The standard functionality of the VLT AutomationDrive can be expanded by replacing mechanical controls with energy-saving electronic motion control options. With the Integrated Motion Controller (IMC) functionality, the VLT AutomationDrive 302 replaces more complex positioning and synchronisation controllers to save time and costs. Application-dedicated functions for optimum performance include droop functionality for load sharing, an integrated brake control for the safe operation of hoists and an integrated process controller for demand-based pumping.

This drive system has an intelligent troubleshooting and remote access facility and also features preventative and predictive maintenance functions that ensure trouble-free operation for reduced maintenance costs and avoiding unplanned downtime.

The VLT AutomationDrive can withstand operation in all industrial environments and low voltage grids, including production facilities operating from 690 V mains networks. AC drives are available in various enclosure sizes and protection ratings, from IP20 to IP66. Integrated DC chokes and RFI filters in all units protect installations by minimising harmonic distortion and electromagnetic interference. Typical applications for this system include mining and minerals, food and beverage, packaging, water and wastewater, marine and offshore, chemicals, cranes and hoists, elevators and escalators, materials, oil and gas and textiles.

BMG has recently been appointed as a Danfoss DrivePro Service Partner – the only company in southern Africa to achieve this level of recognition and one of the first 30 companies appointed as part of this programme globally.

Through this agreement, BMG provides a support service for VLT and VACON drives that encompasses troubleshooting, maintenance, repairs and replacements. As a Danfoss DrivePro Service Partner, BMG also offers specialised training and technical support to improve productivity, performance and uptime for the entire life cycle of Danfoss drives.

BMG’s recent expansion of the distribution and engineering facilities in Johannesburg, includes electronics workshops and a technical resources centre for the repair, maintenance and commissioning of the Danfoss product range.

For more information contact Mick Baugh, BMG, +27 11 620 1538, mickb@bmgworld.net, www.bmgworld.net
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Advantages to using SMC IO-Link solutions:
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- Speed: Easy to integrate components using plug and play
- Added value: Upgrade to Industry 4.0 to increase your competitive ability

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Worldwide leading experts in pneumatics and industrial automation
Analog display for Industry 4.0 applications

The new multifunctional display from ifm electronic is more than just a visual indicator. It pre-processes digital signals in a decentralised manner and, if necessary, passes this information on to a higher-level controller. This intelligent feature makes it ideally suited for Industry 4.0 applications.

The intelligent display visualises different process parameters of sensors with an analog output, or of transmitters with a standard signal output. The freely adjustable scaling factors make it possible to convert and indicate the input signals as physical values (e.g. pressure, temperature or volumetric flow quantity). If you use a pressure transmitter, for example, the volume of a tank can be displayed. It is also possible to offset input signals against each other, e.g. for differential pressure measurement.

Easy setup and use
All settings can be made via a modern, resistive touchscreen interface. The display automatically changes from display mode to parameter setting mode. All parameters are displayed in clear text on the screen, enabling an easy and intuitive use. A password mechanism provides protection against manipulation.

The user can define up to four limit values. Up to four transistor outputs switch if a set limit is not reached or exceeded. In addition, the IO-Link version sends the pre-processed information directly to the PLC. The states of the outputs are displayed and the colour on the display can be shown in red, yellow or green depending on the process value.

Software platform for vision systems

With ASSTech’s new product offering from Wenglor, two and three dimensional data from smart cameras, vision systems and control units with 2D/3D profile sensors can now be evaluated via a central software platform: uniVision 2.1. The standard software is used to analyse images and height profiles in the field of industrial image processing. Since users can now develop a finished vision application intuitively in just a few steps and without programming knowledge, costs and training requirements are significantly reduced.

Clarity through a standardised approach
The uniVision software is structured like an intelligent toolbox. The algorithms for image and height profiles are similar and can be used on different platforms. The measurement module runs on smart camera, as well as vision systems, for example. In total, users have up to 25 different software modules available (measurement, threshold value, cluster, OCR, pattern matching, tracking etc) as well as 14 different templates (read 1D codes, presence check, detect pattern or colour) depending on the hardware selected. There are also extensive video tutorials available online. An assistant is also available for smart cameras which guides users through the setting step by step.

Wenglor has ensured that the software for all hardware components can be set up quickly and easily with no programming knowledge. In order to simplify use of the software for newcomers, predefined templates can be selected and used for the most common standard applications. If additional individual settings are required for a project, more than 25 software modules are available to experienced users. Images, co-ordinate systems or values can be combined with each other as desired, providing newcomers as well as experts with maximum application freedom.

Easy interface connection
The software also delivers an impressive performance when integrated in existing plants and systems. Process data can be processed via standard connections such as digital I/Os, as well as via TCP/IP and UDP. For robots from well-known manufacturers such as Yaskawa, Fanuc or Kuka, the software also offers suitable interfaces for easy integration of control units with 2D/3D profile sensors in tracked welding applications.

uniVision is unique on the market in terms of both function and modular design as it combines software and hardware know-how on a single platform. Wenglor intends expanding features even further in the future, so that the platform remains the central core for industrial image processing.

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Innovative new technologies are laying the foundation for the latest hydraulic systems and applications designed for construction, agriculture, mining and power generation. From smart user interfaces to load sensing valve technology to hybrid actuation systems for renewable energy applications, these solutions lead to productivity increases, energy savings and maximised operational efficiency. Here are five key technology trends presented by Parker Hannifin that are shaping the future of hydraulics.

1. Innovative heavy duty vehicle technology
New generation load sensing valves: Parker’s EQA EcoFormance electric flow amplifier technology is a significant advancement in load sensing valves. By automatically adapting the meter-out pressure to the load conditions, machine control is greatly improved. This is especially useful for functions with slew or jib movements, or digger arms with over-centre movement.

Electro-hydraulic control: Parker’s IQAN Connect is a totally electronic approach that replaces mechanical and electromechanical systems for controlling and monitoring hydraulics in mobile machines. This digital ecosystem ties together Parker’s smart hydraulics and electronics products, resulting in a synergy of intelligent components and customisable software that delivers next generation connectivity while providing flexibility in design and development.

Accurate mobile diagnostics: Abnormal temperature and pressure levels can adversely impact the function of hydraulic lines and pump systems in heavy mobile machinery. Parker’s SensoNODE BlueTM sensors give users an advanced condition monitoring solution that provides accurate readings without excessive wiring, allowing for mobile diagnostics with the cab door closed.

2. A smart user interface to improve machine efficiency
Parker has been building a new presence in industrial Internet platforms and ecosystems by developing a software platform for advanced and flexible user interface design. This enables machine manufacturers to increase machine functionality and efficiency and to create new types of business. Developing smart applications requires a robust software platform for the HMI device. Parker’s UX Toolkit software tool enables easier development of demanding applications for machine instrumentation, control and adjustment. The applications can include supporting applications for core machine functions, smart control systems, diagnostics or prediction applications that decrease downtime, or GPS monitoring and navigation applications. Solutions helping end-users to improve performance and efficiency include applications for mobile hands-free devices, logbooks, usage monitoring, and task management (for example managing bus lines).

3. Energy-saving hydraulic systems using drive controlled pumps
Modern industrial machinery is creating ever-increasing demands on hydraulics to provide more efficient and quieter solutions with a smaller footprint, while maintaining the traditional benefits of hydraulic systems such as high power density, precise control and enduring performance. But these benefits come with the high cost of inefficient energy allocation, heat generation and noise.

Conventional hydraulic power units require oversized pumps and motors to ensure performance during a system’s highest duty cycle demands. In today’s eco-conscious and globally competitive economic environment, a transition to systems in which power is precisely modulated to the requirements of specific tasks within highly complex hydraulic systems is essential. This is where drive controlled pump (DCP) technology can provide a solution to address the challenges of more demanding applications, rising energy costs and greater environmental requirements.
4. Variable speed drives become simpler and more efficient

Variable speed pump drives save up to 70% energy compared to conventional drive solutions. Parker has developed a new, innovative variation of its drive controlled pump. The combination of an optimised axial piston pump with two displacement volumes and a very compact synchronous servo motor offers decisive advantages over common variable speed pump systems:
- Low torque due to de-stroking in pressure holding, resulting in reduced acquisition costs for the motor and frequency converter.
- High traverse speed through up-stroking when in rapid drive mode.

5. New hybrid actuation system ideal for renewable energy applications

Parker has developed a hybrid actuation system (HAS) that is ideal for renewable energy actuation applications such as those used with solar panels, wind turbines and hydroelectric dams. The new hybrid design combines the controllability of traditional electromechanical actuators with the power density, longer life and resistive force capabilities of traditional hydraulic systems.

The result is an improved actuation system for wind and hydro and other renewable energy systems, with a wider range of capabilities.

The hybrid design of this high efficiency, modular system is a fully self-contained system with no hydraulic hoses or power units. Hybrid hydraulics achieve exceptional economies of scale, with the ability to move over a megawatt from a single point. This makes HAS a good choice for large or small arrays.

To read the full story go to https://motioncontrol.co.za/+parker3 or visit https://tinyurl.com/yylk49dd

For more information contact Lisa de Beer, Parker Hannifin SA, +27 11 961 0700, lisa.debeer@parker.com, www.parker.com/za

Machine-level block I/O devices

Concepts for new machinery and plants are becoming increasingly distributed. Control cabinets are getting smaller, or even disappearing completely, and I/O systems which used to be deployed in the control cabinet are being replaced with smaller, rugged versions in IP65/67 with complete protection from dust and water. It is now possible to design smaller machines, as the devices can be mounted almost anywhere on the machine, saving space and costs. This also helps to significantly reduce cabling distances between I/O devices and sensors/actuators, not only cutting material costs, but also making machine transport, installation, and disassembly easier and reducing the likelihood of cabling errors.

In response, Siemens has launched a new generation of machine-level block I/O devices in the form of the Simatic ET 200eco PN. The new I/O family with IP65/67 degree of protection includes five digital I/O devices as well as an IO-Link master device and offers users a whole range of new functions for modern machine concepts and requirements. In their new industrial metal enclosure, the devices are reliably protected from UV radiation and harmful substances even under adverse environmental conditions, making it possible to use the devices outside of factory buildings. The devices are supplied with power via an L-coded plug, resulting in a considerably higher current-carrying capacity. In turn, this enables longer cable routes in the field, and the supply and connection of more energy-intensive components (such as valve terminals) without the need for more supply cables.

The new I/O devices feature individually configurable M12 sockets and support S2 redundancy, making them suitable for use in redundant systems such as the high-availability Simatic S7-1500R/H systems, for example in tunnel applications. Thanks to the internal Modular Shared Input (MSI) and Modular Shared Output (MSO), the user has simultaneous and independent read access to the current switching state of module inputs and outputs from multiple controllers, without the need for additional programming overhead. This enhances machine and plant transparency. The shared device function means that the I/O device channels can be split between two I/O controllers. This allows the creation of flexible automation concepts.

For more information contact Jennifer Naidoo, Siemens Digital Industries, +27 11 652 2795, jennifer.naidoo@siemens.com, www.siemens.co.za
Direct mounting absolute encoder with Profibus interface

Instrotech has announced Scancon’s Model: SCH88BEX, a new ATEX absolute encoder with Profibus Interface. It is a strong, compact (89 mm footprint), cost-effective hollow-bore encoder engineered for rugged conditions, and is the encoder of choice for Zone 1 & 2 applications.

The encoder has hybrid sensing technology and features optical technology for the single turn encoder, and magnetic for the multi-turn version. There are no gear wheels to wear out and the unit can be mounted directly onto the shaft. The innovative, removable end-cap allows for easy mounting and cable installation. It can also be mounted directly into the application without the need for any barrier, isolator or special cable.

The SCH88BEX is certified for worldwide application ATEX, IECEx and North American Class I Div. 1 certifications, and offers the following features:

• Hollow Shaft Encoder (diameter 89 mm).
• Through hollow bore diameter 25-30 mm).
• IP66/67/68 (Nema 6) environmental protection.
• Aluminium (chromital TCP surface treatment).
• Material option stainless steel (AISI 316).

Applications for the Scancon SCH88BEX absolute encoder are found primarily in the industrial oil and gas fields, heavy industry, agriculture, marine and shipping, as well as for cranes. A fibre optic Ex-rated version is available for ATEX Zone 1 applications, which eliminates signal degradation due to electrical noise issues while providing the same superior qualities found in the standard model.

Limit detection is required in most silos and containers to avoid overfilling or unnecessary downtime. The sensor needs to deal with an assortment of process conditions within a wide range of industries. Contingent upon the necessities, the Rotonivo rotary paddle switch is utilised as a full, demand or empty detector in storage silos or process vessels and is suitable for use in almost all solids. With its simple electromechanical measuring principle, it can also be adjusted for extraordinary process conditions.

A motor driven shaft causes the vane to rotate. Once the material level reaches the vane, thereby preventing further rotation, this creates a torque, which is converted via a switch to an electric signal. Once the vane is free again of the material, the output signal is reset, and the motor driven shaft rotates again. This dependable and maintenance-free limit switch for safe level detection in bulk solids has international approvals for use in gas and dust hazardous areas and is also certified to SIL.

The RotoNivo offers a universal voltage power supply, 24 V DC to 220 V AC. It can be connected to the same unit without any alterations being made and with the absence of additional power supply to the unit, for example in very old plants, is completely nullified. This makes it easy for a processing plant to keep one version in stock that can be used in various applications on different parts of the plant. UWT suits the unit to your application, to ensure complete reliability and effectiveness.

For more information contact Instrotech, +27 10 595 1831, sales@instrotech.co.za, www.instrotech.co.za

For more information contact Morton Controls, 086 100 0393, sales@mortoncontrols.co.za, www.mortoncontrols.co.za
DJI has introduced a new thermal imaging camera, the Zenmuse XT S, for its Matrice 200 Series drones. The camera features an infrared thermal imaging sensor with high thermal sensitivity and resolutions for clear and detailed thermal imagery. The Zenmuse XT S enables firefighters, police officers, inspectors and more to gather intelligence beyond the capabilities of visual data, and act quickly to save money, time and lives. The Zenmuse XT S makes high resolution and frame-rate thermal imaging cameras more affordable and accessible around the world.

Refined thermal imaging
The new camera was developed to handle tough thermal imaging applications such as long-range inspections. This is enabled through the 19 mm lens on a 640x512, 25 Hz refresh rate radiometric sensor, and improved further with 2x and 4x digital zoom capabilities.

A live view of thermal data is streamed directly to the operator on their mobile device through the DJI Pilot app, where they can access intelligent features that can quickly get insights from the thermal data. These features include:

- Spot meter: tap a point for real-time temperature measurements.
- Area measurement: select an area to get the max, min and average temperatures.
- Temp alarm: get notified when an object’s temperature exceeds a pre-set limit.
- Colour palettes: adjust the colours applied to thermal data.
- Isotherm: select how colours are distributed across a specific temperature range.

The radiometric sensor on the Zenmuse XT S captures temperature data on each picture which, when stored in R-JPEG file formats, can be analysed later using the DJI Thermal Analysis Tool software to for a detailed inspection report.

The Zenmuse XT S is compatible with DJI’s leading Matrice 200 Series and Matrice 200 Series V2 drone platforms when used with the DJI Pilot flight control app.

For more information contact
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RS Components has announced an expansion of its portfolio of Ultimaker 3D printers to include the lower cost Ultimaker S3, plus the Ultimaker S5 Pro Bundle aimed at professional production environments.

The easy-to-use Ultimaker S3 is a small footprint fused filament fabrication (FFF) 3D printer that delivers high quality and composite-ready performance. The unit offers a lower cost entry point for businesses to adopt in-house 3D printing. Featuring a dual-extrusion printhead with a unique auto-nozzle lifting system and swappable print cores, the printer also offers a 230 x 190 x 200 mm build volume and layer resolutions as low as 150 microns via an optional 0,25 mm nozzle.

Also now available from RS is the Ultimaker S5 Pro Bundle, which offers professional 3D-printing capabilities and meets many engineering requirements from the creation of prototypes to the manufacture of end-use industrial-grade components and parts. The bundle combines the top-of-the-line Ultimaker S5 printer, already available to order separately from RS, along with the S5 Air Manager and Material Station.

The Air Manager delivers a safer working environment by providing closed inside-out airflow for the S5 printer. Optimising print quality and providing a safe physical barrier to the print area, the unit filters up to 95% of the ultra-fine particles (UFPs) that are emitted during 3D printing, enabling more applications with the safe use of more materials.

The S5 Material Station also seamlessly integrates with the Ultimaker S5 printer to help with material handling. Designed to enable higher volume production runs, it allows the loading up of six material spools and up to 4.5 kg of material inside the humidity-controlled chamber. Specially designed smart features include composite-ready feeder wheels, filament flow sensors, and automatic switching when a material spool runs out. Extending the range of materials available to the printer means it can be used across a wider range of applications.

Both the S3 and S5 printers ship with a software suite including: Ultimaker Cura for print preparation; the Ultimaker Connect management software; and Ultimaker Cloud, which enables remote printing. Both the Ultimaker S3 and S5 Pro Bundle are available now from RS South Africa and across sub-Saharan Africa.

For more information contact
RS Components SA,
+27 11 691 9300,
sales.za@rs-components.com,
www.rsonline.co.za
Comtest has announced Fluke’s new 417D, an accurate, durable, point and shoot laser distance meter, designed for indoor and outdoor, dusty and wet conditions. The easy, one-button operation means users can minimise time taken by measuring, while the Fluke brand assures the quality and reliability of measurements taken. And, with simple function buttons, three different measurement tasks can be completed quickly and easily.

The extra bright laser is clearly visible, so the target point can always be seen, even if the target object is in a hard-to-reach spot, or at a long distance. The 417D has a large 2-line illuminated LCD screen and three-buttons for easy-to-use one-handed measurements. Other features and benefits include:

• Measures up to 40 m (accuracy 2 mm).
• One button instant distance measurement.
• Quick calculation of area (square metres).
• Continuous measurement capability.
• Battery life: 3000 measurements, and improved by ‘auto shut-off’.
• IP54 dust and water resistant.

For more information contact Comtest, +27 10 595 1821, sales@comtest.co.za, www.comtest.co.za

The iVu BCR series adds the Code 93, GS1 DataBar, and PDF417 barcode types to the broad spectrum of supported barcodes. This opens up new opportunities for iVu BCR Series barcode readers to solve applications in the postal, pharmaceutical, and inventory management markets where these barcodes are widely used.

The improved algorithms included in the release of Vision Manager 1.8.0 (firmware 2.6.0) enhance the decoding capabilities of the iVu BCR Series, enabling more good reads on damaged, distorted, and other difficult-to-read barcodes. This minimises disruptions on the line, reduces product loss, and ensures reliable data collection and improved traceability throughout the supply chain. Common applications include:

• Device/component traceability.
• Direct part marking (DPM).
• Quality assurance.
• Work-in-progress tracking.
• Automated line changeover.
• High-speed process control.
• Package sortation and shipping.
• End-of-line-palletising.
• Primary and secondary package verification.

For more information contact Brandon Topham, Turck Banner, +27 11 453 2468, brandon.topham@turckbanner.co.za, www.turckbanner.co.za
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