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Coronavirus pulls the trigger on digital transformation

The general consensus among economists is that the disruption to global markets caused by the coronavirus pandemic is going to result in economic upheaval of proportions not seen since the disastrous stock market crash of 1929, and the ensuing fallout known as the Great Depression.

I hope they’re at least partly wrong. Economists often are as it’s unbelievably difficult to accurately quantify all of the contributing parameters that make up such forecasts. They very seldom get it completely wrong though, so I think it’s a safe bet that, as a minimum, we are headed towards a recession. The silver lining is that adversity often galvanises human ingenuity. And recession, unlike the calamity in 2008.

The same holds true for manufacturing. The pandemic has put a lens over what the manufacturing industry already knew; its traditional ecosystems (both in terms of value chains and shop floor production lines) are outdated, and more agile, digitally enabled solutions are required.

All well and good for those manufacturers that already had a transformation plan in place before the disruption happened. For those that did not, the problem becomes more complex because making strategic investments during times of uncertainty is not easy. On the other hand, for those manufacturers operating with reduced staff due to social distancing requirements, this might be the perfect opportunity to get started.

Whatever the reasons, the same logic applies to digital transformation as it did pre-pandemic; just the sense of urgency has changed. Ideally, the plan has to be sustainable and, above all, make good business sense. But the overriding constraint is still there, namely: very few companies have the resources or insight to tackle digital transformation on their own. The technologies are complex and if they are not correctly applied the result could be a drop-off in efficiency, rather than the hoped for improvement. In a nutshell, finding the right technology partners is vital. To this end, we hope you find the feature we have put together on the Industrial Internet of Things useful. You will find it on page 18.

Your media partner

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South Africa has been experiencing a time like no other, with businesses and individuals across the country having to change their behaviour in efforts to curb the spread of the new coronavirus. “While it seems our efforts have been successful in ‘flattening the curve’, it hasn’t been an easy time,” says Nidec Control Techniques South Africa regional manager, Bruce Grobler. “Level 3 has introduced some welcome relief on restrictions, but we can’t expect things to go back to normal anytime soon. In some way or other, we must persevere and continue with business unusual. While many things have changed, we are pleased that our ability to service customers has remained constant from the very beginning of hard lockdown, through level 4 and 5 restrictions, and onwards now into level 3.”

Nidec Control Techniques’s role in supporting essential services has meant the company and its valued partners have been able to continue operations, albeit within the mandated health and safety restrictions, including operating with a reduced workforce. “We have done our part to ensure the safety of our staff and customers while ensuring our products and services are available for key industries,” adds Grobler. “This includes support for power utilities, water and wastewater management, and commercial and pharmaceutical manufacturing facilities. We have even done work directly with the medical industry, as our drives are used across a wide variety of medical applications from medical textiles for PPE, to scanning machines, to essential building services like elevators, HVAC and utilities.”

The company’s drives are also used in a wide variety of applications in the food and beverage industry, from conveyors to packaging to refrigeration. “We have found that in addition to having a range of drives and spares in stock locally, our additional services and support have been used extensively by customers needing to restart operations or recover from breakdown,” elaborates Grobler. “April and May were busy months for our technicians as we aimed to ensure the country’s critical plants and facilities were up and running. We owe our success to our valued employees and our extensive network of hard-working partners and distributors, who have remained on hand to assist with queries and call-outs, and risen to the challenges faced under the new normal.”

Only time will tell how the rest of this pandemic plays out, but throughout the coming progressions between various pandemic alert levels in South Africa, Nidec Control Techniques and its partners will continue to be at the service of those industries allowed to operate, and those returning to work in the coming weeks and months. “We look forward to continuing our role in the reopening of South Africa’s economy and ensuring smooth operations for our valued customers, as we strive to act responsibly in the response to the Covid-19 pandemic,” concludes Grobler.

For more information contact
Jacqui Gradwell, Nidec Industrial Automation Southern Africa, +27 11 462 1740, jacqui.gradwell@mail.nidec.com, www.nidecautomation.com
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DRIVE SPECIALISTS SINCE 1973
New managing director of Rockwell Automation for Sub-Saharan Africa

Effective from 1 June, Canninah Mapena is now heading up Rockwell Automation’s activity in sub-Saharan Africa. Operating from the company’s offices in Randburg, Mapena will lead the business in the region and continue the implementation of Rockwell Automation’s global and pan-EMEA sales strategies and initiatives, with a focus on bringing the ‘connected enterprise’ to Rockwell Automation customers across the region.

With extensive experience leading regional departments of other large American and European multinational industrial automation and software companies, she is well placed to offer business development, improved customer relationship management and strategic planning to drive Rockwell Automation’s growth in the region. In her new role, Mapena and her team will continue to increase customer intimacy and collaboration, driving sales through increased customer satisfaction.

For more information contact Michelle Junius, Rockwell Automation, +27 11 654 9700, mjunius@ra.rockwell.com, www.rockwellautomation.co.za

ARCA delivers control valves for biomass heat and power plant

Kronospan, a global manufacturer of chipboards, laminated flooring and worktops, has been working with the ‘Factory Of The Future’, EU’s project to reduce CO₂ emissions and other environmental impacts of production plants. To achieve this, a biomass heat and power plant was commissioned.

For the construction of the biomass power plant, ARCA supplied almost all of the control valves and desuperheaters for the water-steam-condensate, including all valves for the steam drum, boiler, feed water tank and condenser. Around the turbine, two steam pressure reducing and steam conditioning stations were supplied, which redirect the steam in case of turbine failure. The high steam pressure is reduced in several controlled and fixed stages and at the same time the temperature is cooled with the integrated ARCA steam-assisted nozzle placed in the centre of the pipeline. These valves are of great importance for the availability and safety of the plant. They can close within 2 seconds as well as open by means of a solenoid valve. The steam test unit for pressure monitoring after the bypass station also formed part of ARCA’s scope of delivery and safety concept.

The production of wooden products requires energy and heating. This process also creates wooden offcuts, which are ideal energy sources for cogeneration. With this approach, wood that has come to the end of its utilisation cycle can be thermally recycled, thereby replacing fossil fuels with renewable energy.

Arca Control Valves and desuperheaters are in use through South Africa in a wide range of process industries.

For more information contact Valve & Automation, +27 31 579 2593, sales@valve.co.za, www.valve.co.za

RS Components extends distribution partnership with Rockwell Automation

RS Components has announced a partnership with Rockwell Automation, a global leader in industrial automation and digital transformation. With immediate effect, RS is also authorised to supply Rockwell Automation products into Africa and Russia, including its Allen-Bradley and Allen-Bradley Guardmaster brands.

The Rockwell portfolio offered by RS extends across a vast range of automation and control products designed to improve manufacturing processes, from design and installation to operation and maintenance. A snapshot of the parts available includes smart devices for machine guarding and safety; PLCs for machine control; industrial push-buttons; human machine interface (HMI) displays and accessories; and sensors and rotary encoders.

Kristian Olsson, vice president of product and supply management at RS, said: “This marks a significant next step in our relationship with Rockwell Automation. Customers across Africa, Europe and Russia will reap the benefits of accessing essential automation and control gear from RS, whether they are sourcing parts to enhance safety or to increase machine and plant-wide efficiency.”

Rockwell Automation and Allen-Bradley is now available online from RS Components in South Africa.

For more information contact RS Components SA, +27 11 691 9300, sales.za@rs-components.com, www.rsonline.co.za
Cummins ReCon parts a cost-effective alternative

Cummins ReCon parts are not just repaired or rebuilt, but are remanufactured to meet or exceed your engine’s original specifications for performance, reliability and durability. These parts also include the latest upgrades, thereby ensuring that customers always have access to the latest technology, according to Marco Gouveia, parts marketing lead, southern Africa.

“The old parts that customers return to us that actually have some value in their core are remanufactured,” explains Gouveia. “Our rigorous process commences with an initial inspection to ensure it still meets standards and can be remanufactured. It is then stripped out, machine-cleaned, and recalibrated to ensure it still meets our exact specifications. When customers buy Cummins ReCon parts, they are not merely replacing old or worn-out components, but have the latest developments built in, thereby gaining additional benefit.”

Cummins is therefore able to offer its customers two options, namely new or ReCon components, with the latter being a particularly cost-effective option. ReCon Parts typically include water, fuel, and lubrication pumps, as well as injectors and turbochargers. The major benefit for customers is that they are immediately issued with a replacement ReCon part upon returning it. All fast-moving items are available off-the-shelf throughout Cummins’ extensive distribution network for maximum efficiency and cost-effectiveness, particularly as any downtime is minimised.

“Cummins has a very extensive network of dealers and distributors, not only in South Africa, but across the world,” elaborates Gouveia. “We have about 6500 outlets, which means a customer with a broken component just has to visit the closest authorised Cummins dealer or service partner to have the condition of the part assessed, and ensure that the correct replacement component is provided to replace it in the shortest time possible.”

Cummins has been promoting its ReCon parts programme with great success in South Africa for the past 20 years, in order to be able to offer maximum value-add and customer service. A major feature of the programme is that Cummins offers a market-leading one-year warranty. Typically, competitors offer a refurbished part with a six-month to one-year warranty, which also covers any progressive damage that may occur. This means that if the ReCon part in question actually causes an engine to fail, Cummins does not just replace the component, but will also repair any other damage that may have been caused by the faulty component.

For more information contact
Deepa Rungasamy, Cummins Africa Middle East, +27 11 589 8512, deepa.rungasamy@cummins.com, www.cummins.com

Artificial Intelligence and Dawn of Disruption

Since the phrase Artificial Intelligence (AI) was coined in the 1950s, technology has advanced significantly and transformed our social and work worlds. Some industry luminaries are bullish about the potential of AI, like Sundar Pichai, Google CEO, who says: “AI is one of the most important things humanity is working on.” This sentiment is echoed by this statement by Jeff Bezos, CEO of Amazon: “Machine learning and AI will empower and improve every business, every government organisation, every philanthropy.”

Others, like Alibaba past chairman Jack Ma, are more cautious: “AI is a threat to human beings. AI and robotics are going to kill a lot of jobs, because in the future, these will be done by machines.”

Be this as it may, AI is here to stay and will continue to disrupt our daily lives. Many people don’t understand what can be done with AI, least of all how to transform their businesses using it, or how it will impact their careers. Enter Dawn of Disruption (DOD), a South African developed gamification based, team focussed workshop that demystifies AI, dismisses the fear factor, and facilitates the creation of an inclusive AI strategy for the business. The workshops are run by accredited DOD practitioners and follow a flexible pattern with an interactive audio-visual presentation on the history of AI, plus current and work-in-progress AI use cases. Next follows the playing of the DOD board game where specific AI application ‘cards’ applicable to the business are discussed and filtered for use during the final strategy formulation session of the workshop.

Many blue-chip companies have already participated in these workshops with documented benefits like future proofing their businesses and employees, as well as achieving a competitive advantage by adopting a first-mover AI strategy. The world is currently experiencing the worst disruption in living memory; most of us were not prepared and have suffered in some way or another. The DOD intervention is the ideal way to prepare for the next, inevitable disruption.

For more information contact Nico Landman, Nicabi Facilitation, +27 66 297 0933, nico@nicabi.com, www.nicabi.com
Yaskawa Southern Africa names new MD

The southern African arm of leading industrial robotics company Yaskawa has appointed Andrew Crackett to head up operations in the role of managing director (MD), as of 1 June. He will be taking the reins from previous MD, Kurt Rosenberg, who is starting a new chapter within the Yaskawa family’s Swedish division.

With the international COVID-19 crisis certain to upend every sector in ways we are only beginning to understand, Crackett is confident that the robotics industry has much to offer South Africa as we work towards resuscitating our economy. Crackett hopes to be able to use his position to accelerate change in the way South Africa works, to meet growing demand in our industries and to establish robotics as an accessible option for South African businesses of all sizes.

Robotics forms an essential pillar of the 4th Industrial Revolution, and with economies, even those in the developed world, taking an unprecedented knock in 2020, speed and agility will be key to bouncing back. With its years of experience, Yaskawa southern Africa is well positioned to help businesses in the region maximise their production and manufacturing.

For more information contact Andrew Crackett, Yaskawa Southern Africa, +27 11 608 3186, andrew@yaskawa.za.com, www.yaskawa.za.com

Booyco boosts in-house engineering team

At the forefront of technological innovation in collision avoidance systems (CAS), Booyco Electronics is investing heavily in its expertise by actively growing its engineering department in the coming months. “Engineering the solutions that will ensure safer working places is at the heart of our business,” explains Pieter Wolfaardt, chief operations officer at Booyco Electronics. “Collision avoidance is a field that demands highly technical electronic devices as safety deterrents, and we are continually strengthening our capacity to develop and deliver these solutions.”

As the standards governing collision avoidance in the mining industry become more stringent, the technologies serving this need are evolving rapidly as well. Booyco Electronics has a large market share in South Africa, and its learnings from implementation across many mine sites are incorporated in solutions offerings, further underpinning the company’s commitment to industry best practice principles.

“It is our engineering team that develops the product offerings for our customers, and the development process never ends,” says Wolfaardt. “They are involved in research and development, extensive testing, and ongoing upgrades.”

Wolfaardt highlights that the company is looking ahead to the kinds of technologies that will be required by 2025, and is aligning itself with that vision. All three of the company’s main product lines – CWS, CXS and PDS – are receiving constant attention and improvement.

Among the most important recent technical achievements has been a scalable design that suits a wide range of customer requirements without having to change hardware on the equipment. Rather, the firmware or the software can be updated on a continuous basis.

“Our increased engineering capacity will support customers who are still getting to grips with changing CAS requirements, especially those mines who are new to CAS,” elaborates Wolfaardt. “Customers often request that our systems be tested on their trackless mining machinery as they seek the optimal solution. With our increased capacity in the engineering department, we can offer a highly systematic and professional service in terms of technology integration and on-site testing.”

The substantial current team of 18 engineers, artisans and technicians will grow to over 30 in the near future. Key qualifications in the department include electronics engineers as well as B.Tech degrees and national diplomas, with qualified technicians undertaking most of the testing functions.

“Mining experience is also important in our team, as this improves the way we design and integrate systems for the real working environment in mines,” concludes Wolfaardt.

For more information contact Booyco Electronics, 086 126 6926, info@booyco-electronics.co.za, www.booyco-electronics.co.za
Thermometer guns on coronavirus front lines: accurate or not?

If you have not already had your temperature taken before entering a public building, there is a good chance you soon will. It has become an iconic image of the coronavirus outbreak worldwide: a masked person aiming a non-contact infrared thermometer gun at the forehead of another masked person to screen for signs of elevated body temperature associated with fever.

The expectation is that early detection will enable preventive action to be taken to stop the virus from infecting staff and customers, and damaging businesses. Healthy core body temperature is considered to be between 36°C and 37.3°C and people with a temperature of 38°C and higher are generally considered a risk and should be referred for further testing. This small margin of error requires accurate measurement to be effective, according to Chris du Plessis of SA Gauge, a local manufacturer of pressure and temperature instrumentation.

As demand for these thermometers has increased, it has resulted in a flooding of the South African market with many different brands, imported by companies or individuals often with limited or no experience regarding the quality and accuracy requirements, or the know-how to service and calibrate these instruments.

Calibrate to reduce the uncertainty of the measurement

Many of these forehead thermometers used on the front lines of the fight against the coronavirus are found to be inaccurate. “To avoid a false sense of security and to maximise the value that these thermometers could add to the fight against the virus, a calibration certificate issued by a reputable local company would minimise the risks associated with the use of an inaccurate thermomter,” explains du Plessis.

Operator training essential

Although widely used in varying environmental conditions for temperature screening of people, these non-contact thermometers were typically designed for indoor use by trained personnel for quick temperature screening of subjects in a controlled environment.

To cope with the sudden demand, operator training is often rushed or wholly inadequate, increasing the risk of false measurements. Sudden changes in environmental temperature could further influence the measurement validity. Operators should receive adequate training in the use of the thermometers, as the instruments should be allowed to acclimatise to the working environment before use, indoors or outdoors.

Practical considerations when taking a temperature

Infrared arterial temperature is measured by aiming the infrared thermometer near the centre of the forehead, holding it straight and steady, normally between 3 cm to 5 cm away from the person, and pressing the measurement button to display the forehead temperature. If in doubt, allow 5 seconds between measurements.

Forehead temperature is lower than core temperature, and clinical forehead infrared thermometers use a mathematical algorithm to convert the temperature taken from the forehead to display an equivalent core temperature.

Normal forehead temperature can vary significantly depending on your environment (indoors or outdoors), exercise, hair or make-up on the forehead, perspiration, direct heat or air conditioning, spicy food, as well as using fever reducing medication, etc.

Maintenance and calibration

Moisture, a dirty lens, battery condition, and careless handling or dropping of the instrument could influence measurements. To remain confident that the steps taken and monies spent by companies to fight the coronavirus adds value to their efforts, du Plessis recommends periodic servicing and calibration of these instruments by reputable companies.

SA Gauge offers a two-hour turnaround time for such a service. Thermometers dropped off by 10:00 am can be collected by lunchtime, ready for the afternoon rush. After-hours calibration can also be arranged.

Why measure at all if you are not going to be sure of the results? SA Gauges’ calibration laboratory ensures internationally traceable accuracies through its ISO/IEC 17025:2017 accreditation by the South African National Accreditation System.

For more information contact SA Gauge, +27 31 579 2216, sales@sagauge.com, www.sagauge.com
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Even people with many years of experience in this field have found the courses a real eye opener.

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

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From the office of the CEO

Long name change for the SAIMC NPC: Society for Automation, Instrumentation, Mechatronics and Control

The SAIMC NPC’s official name, as registered at the CIPC, is SAIMC NPC, registration number 2010/014751/0, and was derived from the Society for Automation, Instrumentation, Measurement and Control. The SAIMC NPC aims to be the ‘Voice of Automation’ in sub-Saharan Africa and as such joined the Automation Federation where it aims to create a formal Automation Engineering discipline.

Before automation became a buzzword, the people working in this field were known as control and instrumentation (C&I) specialists. Control and instrumentation referred to the whole control cycle, from initial measurement obtained from an instrument, to the final control output.

As control elements improved and the people’s understanding of the technology grew, the control and instrumentation building blocks were integrated into complete systems, and control and instrumentation became automation. No longer was automation limited to the electrical and computer fields and it expanded to other engineering disciplines such as civil, mechanical, etc.

The SAIMC lobbied the Engineering Council of South Africa (ECSA) for a separate Automation Engineering discipline. It was not that automation required new development of course modules, but rather to combine subjects at educational institutions differently in order for students to get to grips with the techniques of automation in the various other engineering disciplines.

The Mechanical Departments of education institutions also saw this growing need and developed the Mechatronics qualification. In South Africa, ECSA has just released a draft document called ‘Overarching Code of Practice for Performance of Engineering Work’. Although there is no reference to automation, there is a reference to mechatronics as a separate engineering discipline.

Automation is such a wide field that it covers the automation and control of chemical processes like distillation columns, various types of reactors and more. It also covers the control of mechanical devices such as found in the anti-surge of compressors and shut-off valves, variable speed drives, etc., as well as the automation of business processes, buildings, etc.

The board of the SAIMC, after a survey of its members, decided to support the efforts of industry and ECSA by including mechatronics within its long name, to indicate the close relationship between automation principles and the systems being controlled by them. Although mechatronics was ‘born’ in the mechanical department, it adopts the technologies found within automation as a major part of its activities.

Several universities in South Africa are now offering engineering qualifications in mechatronics. The final two years have a strong focus on control, measurement and automation. The automation industry is also the primary employer of these graduates, according to Professor B. van Wyk, NMU.

The SAIMC is excited about the expansion of engineering disciplines within ECSA. With this change the SAIMC will support the newly envisaged mechatronics discipline as the scope is broadened to cover not only the mechanical field, but also to chemical, building and other disciplines.

Yours in automation,
Johan Maartens.

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Yours in automation,
Johan Maartens.
Johannesburg branch

Technology can be a wonderful thing. We have resources that allow us to talk face to face with people thousands of kilometres away. We have the ability to order equipment, furniture, food, or clothing online, without stepping out of our homes. And yet we all need human interaction and the correct data available to be able to do all this.

Technology works in a similar manner within industry. Industry requires the correct human input, communication and parameters (flow, density, temperature and pressure) for all to work coherently. In a way that forms a unified whole, if one or more of the measuring principles are wrong or not there, errors would occur. Your output would deviate from your expected results.

The questions raised for each new line, plant, area or application, should be ensuring that we have understood correctly what is required for the process and the end result. How important is the old thought process of stop, think, plan and do? Instead of doing things out of familiarity, we should always check and plan before taking the next step.

Keep progressing, improving and moving forwards.

Stay safe, from the SAIMC Johannesburg team.

Vaal branch

The branch held an online technical evening on 3 June, which was presented by SICK Automation. Our presenter, Dustin Naicker, has more than 9 years’ experience in analytical instrumentation and analysers. Dustin gave an in-depth presentation on ultrasonic flow and the different factors that need to be considered in the selection and design of these critical instruments.

The increasing global demand for energy drives a need for diversification in gas production, which puts a stronger focus on the development of unconventional natural gas sources, such as shale gas and coal seam gas. As a direct consequence, the number of unconventional gas wells is increasing worldwide.

Monitoring of unconventional gas production is commonly done via a gas flow meter close to the wellhead or at the gathering station. Depending on the reservoir and the quality of the gas treatment equipment on the wellhead, the gas may contain liquids and contaminants. They can, depending on their volume fraction, degrade the flowmeter measurement performance and, therefore, the monitoring reliability. Furthermore, the output of the gas well may fluctuate unpredictably on relatively short time scales and will, depending on the maturity of the gas production, generally decline over longer time periods. Monitoring of a time-varying production rate requires a rugged flowmeter with high turn-down and with minimised operational costs to meet economic requirements.

Gas metering points in this production environment are traditionally equipped with differential pressure meters even though new-technology gas meters like ultrasonic meters provide several advantages over differential pressure technologies. Gas producers have experienced in the last years that the lower operational expenditures and technology benefits of ultrasonic meters compensate for the higher initial investment which results in the fact that ultrasonic meters for gas production applications become more and more accepted.

The use of ultrasonic meters in gas production applications, at gathering stations, or in gas processing plants, is not limited by the ultrasonic technology itself.

It has been shown that the combination of ultrasonic technology, a special meter design, low manufacturing tolerances, and minimal meter-to-meter variations allow transferring ambient air flow test results to high-pressure natural gas. Understanding the key influencing factors on the meter characteristics and keeping them at an uncritical level of variation is vital in order to meet Class 1 performance requirements.

Finally, it could be shown with field test data from a shale gas application that employment of customised ultrasonic meters for gas production applications can have substantial economic advantages even after a short time. Lower lifetime costs are also significant.

The installed base of ultrasonic meters in gas production applications is rapidly increasing. Gas production companies may be forced to pay more attention to operational costs of wellhead equipment and overall profitability driven by worsening economic conditions for the oil and gas industry. Here, virtually maintenance-free ultrasonic meters customised for gas production applications can contribute to a more economical gas production. not least thanks to their high turn-down ratio.
In memoriam: Hendrick Frederik (Hennie) Prinsloo

It is with great sadness that the SAIMC announces the death of branch general manager Hendrick Prinsloo after a short but brave battle with cancer.

A stalwart and passionate member of the SAIMC since 1 May 2010, Hendie became the reluctant leader of the Durban branch of the SAIMC in 2017. Reluctant only by virtue of never wanting to be in the limelight, he was a true leader in every sense of the word, showing passion, decisiveness and humility.

He led by example, inspiring his fellow committee members to accept nothing less than Platinum status in the branch awards sector (something he never missed an opportunity to tell people!).

Always looking for new opportunities to add value to members and patrons alike, Hendie had a burning determination to empower and grow the students in the branch, understanding implicitly that they represent our future. Together with Prof. Naidoo he started the first Student Chapter of the SAIMC, the first student/industry day at UKZN with Prof. Saha, a revival of the student awards and introduced student training courses given by various vendors.

Hennie loved life and lived it to the full – saddling up his horses and Harley Davidson with equal enthusiasm and sharing his love of his farm ‘Horse n Home’ whenever the opportunity presented itself. The annual ‘chairman's braai’ became such a regular occurrence that the ‘annual’ had to be dropped and was equalled in popularity only by frequent breakfasts at the other ‘haunt,’ Surf Riders, when he felt the team needed a welcome break or a more formal ‘thank you.’ He always acknowledged the hard work of his committee, deflecting any direct praise for him with his standard words about the ‘great team’.

Humble, salt of the earth with a great sense of humour, Hendie was larger than life in both body and spirit. He will leave a huge hole in our lives as our leader and friend.

We will miss you enormously, Hendie. The next Platinum is for you!

Read a commemorative and celebratory newsletter dedicated to Hendie at https://www.instrumentation.co.za/papers/SAIMCHennie.pdf

Cape Town branch

Technology evenings: Out with the new, in with the old… or not?

With the lockdown slowly lifting and life stabilising into a new normal, we at the branch are grateful that another technology event was successfully hosted in these interesting times.

Presented by Sagadevan Kanniappen from Wika Instruments, the event was well received. Employed at Wika Instruments as a product specialist with experience in field-service, research, development and renewable energy designs, Sagadevan presented on the various instrument technologies used for flow measurement in industry. The session was packed with technical knowledge to assist people choose the correct instrument for many different processes and applications.

The branch would like to thank Wika Instruments and Sagadevan for their assistance in hosting a successful technology evening and enlarging everybody’s knowledge about this specialised field.
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**Iritron**
Iritron is a new millennium technology company providing quality solutions in the fields of electrical instrumentation and control systems engineering, systems integration and simulations. It has a proven ability to manage projects efficiently and produce high quality results. It has an extensive track record of successfully implementing plant infrastructure reticulation, designs, and automation and information systems. Iritron, a TUV accredited ISO 9001:2008 technology company, is able to offer its clients PLC, DCS and scada software and hardware, as well as electrical and instrumentation design, engineering, project management and commissioning services.

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**SAM – Systems Automation and Management**

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**Proconics**

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Whether you are a consulting engineer, a system integrator or a project house, we have the perfect marketing platform to put you in touch with nearly 4500 relevant control and automation practitioners in the automotive, food & beverage, mining, petrochemical, power, pulp & paper and water & wastewater industries.

Contact: jane@technews.co.za
Whether in tank trucks by road or in tank cars by rail, chemicals must be transported with caution because more than 40 percent of such products are classified hazardous. Despite this percentage of high-risk freight, the procedure for filling vehicles and train cars with these substances is not always the same, since gases, liquids and granules have different properties. In addition, there is often a risk of explosion. This means creative solutions are needed to provide the necessary level of safety.

Voortmann & Co. KG Steuerungstechnik is a market leader in control, compressed air, and loading and spraying systems, based in Issum, Germany. Manuel Greefrath, a loading technology specialist at the company, is aware of the risks involved in loading chemical substances: “Filling road tankers and tank cars is not usually a fully automated process, but instead, is carried out by workers on a platform. This means that one wrong decision can have disastrous consequences for people and the environment. Because the vehicles can be up to four metres tall, employees have to move the loading platforms to the appropriate height, which poses yet another risk of damage.”

The workers also wear heavy-duty clothing in these environments, which sometimes includes breathing apparatus. The restricted freedom of movement and reduced field of view increase the likelihood of an error. This is where the Voortmann experts come in, with solutions that include a wide range of fall protection systems tailored to specific loading functions. For several years now, the experts have been installing light barriers and contact strips in these constructions. However, exceptional potential was discovered in the field of laser sensors. This technology enables Voortmann to make loading safer and more efficient.

More automation, more safety
The underlying idea: A platform’s safety cage not only moves at the touch of a button, but also uses a 2-D Lidar sensor installed underneath the construction to detect obstructions. If the sensor detects a foreign object or a tanker part, for example, the scanner emits a signal that activates a horn or warning light and stops the lifting platform. This automatic shutdown function makes damage and crashes a thing of the past. To implement these applications, Voortmann relies on the R2000 2-D Lidar sensor from Pepperl+Fuchs, which is commonly used in automotive manufacturing, warehousing and auto-guided transport systems.

However, this award-winning sensor also impresses outside of factory halls and warehouses, reports Julian Krato, product specialist for Complex Systems at Pepperl+Fuchs: “Multiple evaluations from individual scans and an adjustable detection field allow us to recognise and filter out obstructions such as raindrops and snowflakes. The R2000 also has an IP67 rating and is therefore well suited for outdoor use.”

The technical core of the R2000 is Pepperl+Fuchs’ own Pulse Ranging Technology (PRT), which performs an enormous number of individual measurements in a short period of time. With up to 54 000 pulses per second and a high angular resolution, the sensor achieves extremely precise measurement results and detects obstructions with virtually no delay. “From a safety perspective, fast and accurate PRT is the ideal choice...”
“We had to solve a paradox. How can one put a photoelectric device, which logically requires a clear line of sight to operate properly, into an enclosure?”

Industrial sensors meet explosion protection

These end customers continue to surprise with challenging new requirements. A customer recently approached Voortmann with the request to use a fall protection system based on the R2000 for tank cars in ATEX Zone 1. This presented a real challenge because both the operating voltage of the R2000 and the optical and electromagnetic radiation it emits are potential ignition sources in hazardous areas. Upon receiving the customer request, Greefrath and his colleagues came up with the idea of installing the sensor in an ATEX-certified enclosure. As Greefrath explains, they did not have to look far to find a partner to implement this: “Since Pepperl+Fuchs has an excellent international reputation in the fields of industrial sensor technology and electrical explosion protection, we were sure that we would find a solution together. The positive experiences we had during our collaboration on non-explosion-protected solutions also supported this.”

Pepperl+Fuchs eagerly accepted Voortmann’s request, as Henning Hansen, process automation sales engineer, explains: “We had to solve a bit of a paradox here. How can one put a photoelectric device, which logically requires a clear line of sight to operate properly, into an enclosure?”

The answer to this crucial question was mounting the R2000 in a Pepperl+Fuchs GUB series enclosure made of copper-free and corrosion-resistant aluminium. This enclosure has Ex d (flameproof enclosure) protection and an integrated viewing window that enables the sensor to scan below the lifting platform. A flat disc and an R2000 tilted 15° toward the disc were used to avoid light refraction and possible scattering, which could distort the signal.

Multiple benefits in one solution

Voortmann now benefits in many ways from this jointly developed solution. By working closely with Pepperl+Fuchs, the company gained valuable new insights into combining laser sensors and explosion protection. At the same time, Pepperl+Fuchs will be able to offer its own customers an integrated system for non-hazardous and hazardous areas that can be used internationally and in Zones 1, 2, 21, and 22. This ensures very high efficiency in planning, mounting, commissioning, storage, and subsequent service.

For more information contact Pepperl+Fuchs, +27 87 985 0797, info@za.pepperl-fuchs.com, www.pepperl-fuchs.com
The Fourth Industrial Revolution

Welcome to this month's bumper feature on digitalisation and the Industrial Internet of Things. Digital transformation – aka the Fourth Industrial Revolution – was regarded by many as the future of manufacturing even before the coronavirus pandemic turned our lives upside down. Since then, the ability to access information and work remotely has propelled itself from an emergent ideal to a requisite necessity. As very few organisations have the resources to manage a digital transformation on their own, we designed this feature to highlight the diversity of vendors out there who are all ready, willing and able to help you get started.

On behalf of the team at SA Instrumentation and Control, our thanks to everyone that contributed the interesting and informative content which appears on the pages to follow. Wishing you, our readers, safe travels on your unique journey down the road to digital transformation (even though you may be wearing your mask).

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Festo South Africa
Festo plays a major role in shaping the Industry 4.0 trend by providing expert cloud solutions that allow customers, machine and systems builders to significantly improve their overall equipment effectiveness. We offer complete electric and pneumatic automation solutions, from the cloud through control technology, IoT gateways, sensors and actuator technology.

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Never before has it been so important to allow the collection and use of relevant and important data. Only an optimum insight into the systems will make it possible for you to take the right decisions for your maintenance and production control. This will give you the security that the production requirements of tomorrow will be met.

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SMC has launched the newest addition to its IoT product range: the EX600-W wireless valve bank. With its state-of-the-art frequency hopping technology and carefully selected operational frequency bandwidth, you can be assured that interference between valve bank and PLC is all but negligible. This latest addition further attests to SMC as leaders in Industry 4.0.

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Since its foundation in 1961, Rittal has continuously evolved into the world’s leading systems provider for enclosures, power distribution, climate control, IT infrastructure, and software and services. Today, ‘Rittal – The System’ offers you a perfectly coordinated system platform. It unites innovative products, pioneering engineering solutions and global service to accommodate the most diverse requirements.

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With the worldwide trend and the exponential growth of the Industrial Internet of Things (IIoT), Phoenix Contact has adapted accordingly with its Smart Business BU. This data-centric offering includes the development of IoT platforms, smart device connectivity, smart services of the Proficloud, and services to integrate to other platforms.

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Throughput Technologies has been supplying remote access and IIoT products for many years and has built up the expertise to tackle a host of industrial applications. Some well-known brands on offer include Secomea, Westermo/Virtual Access and ProSoft. With products from these leading suppliers the company is able to solve a variety of industrial problems.

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Countries are looking towards more sustainable, cleaner energy solutions. Renewable sources of energy such as solar, wind and biogas are very promising, but the transition cannot happen overnight. It is predicted that over the next 10 years the overall energy mix in the southern African region will steadily shift away from traditional coal towards natural gas as an intermediate energy source. This region is fortunate to have a number of significant natural gas resources, both offshore and in parts of the interior.

The challenges of working in remote locations
I am involved in a number of projects investigating the feasibility of coal-bed-methane (CBM) in southern Africa. During one of these projects, I came across an interesting control and automation challenge. In this project the mining operation is in a very remote location, far away from any of the infrastructure you would have in a typical industrial zone. There is very little, if no connectivity. The gas fields are spread out over hundreds of square kilometres where there is little or no other development. Across the gas field, by the end of the project hundreds of boreholes (wells) will be drilled down just far enough to reach the underlying coal beds from which the methane-rich gas can be extracted. The footprint of the well heads at the surface is very small, approximately the size of a small swimming pool with a limited amount of processing equipment. This method of extraction leaves the underlying coal beds intact and avoids the need for expensive and environmentally damaging underground mining. The trapped methane-rich gas already in situ slowly permeates through the coal beds to collect in a manifold system that routes the gas, together with a fair amount of pumped water, up to the surface.

Each well requires careful monitoring and control of the water level, gas pressure and flow rate, as well as a number of other critical parameters. The gas from the wells is routed by pipeline to a central processing facility.

Owing to the remote location of the well field, the number of wells and the distances involved, it is not feasible to have a process operator visit each well head often. The pumping, gas processing and control equipment needs to be able to operate autonomously for weeks on end. Should the data links fail, the well must continue to operate safely, and if necessary, shut down without damaging equipment, and avoiding harm to the environment. It must be possible to control level and flow/pressure set-points from a remote location to balance the flow rates to the downstream consumers. It must also be possible to send alerts/alarms from the well head to the operators when there is a fault. Historical data relating to the performance of each well needs to be collated and stored for later analysis. The operating status of each well needs to be displayed in a dashboard that allows the operators to get a good overview of the entire operation. On-site activities such as sampling and equipment maintenance need to be logged in a database to provide important context information for later analysis.

Industry 4.0 realisation
This example highlighted for me some of the real-world control and automation design decisions that need to be taken in such a remote location. What is particularly interesting to me (with my IT background) is that, provided certain steps are taken, the entire system is ideally suited to take advantage of cloud architectures and innovative concepts such as the IIoT (Industrial Internet of Things), edge computing, cloud data analytics and AI, with advanced visualisation/dashboards, all through the cloud. While this might be an exciting project for some, it is probably at the same time a nightmare for a control and automation engineer concerned about connectivity, reliability, performance and security.

Connecting the control units at each well to a common supervisory control system can be achieved using fibre-optic, wireless or satellite connections. Each of these connectivity options has a number of advantages and disadvantages, as well as cost implications. Owing to the remote

Gavin Halse

Gavin Halse is a chemical process engineer who has been involved in the manufacturing sector since mid-1980. He founded a software business in 1999 which grew to develop specialised applications for mining, energy and process manufacturing in several countries. Gavin is most interested in the effective use of IT in industrial environments and now consults part-time to manufacturing and software companies around the effective use of IT to achieve business results.

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location of the well field, most wells are out of range of commercial cellular networks (ruling out the use of 3G, LTE and certainly 5G). Under the circumstances, building and operating a dedicated industrial wireless network is probably the most cost-effective alternative. This will require Wi-Fi communication towers strategically positioned across the well field with directional antennas so that each wellhead control system can communicate data wirelessly to a central break-out point to the Internet. For the connection to the cloud, a good satellite link is the best alternative, however this can introduce latency and reliability challenges, and bandwidth management is also critical.

Modern control engineers need a diversity of skills
Because the wells need to operate autonomously there needs to be a local edge device at each wellhead that will handle the control functions as well as data acquisition and storage, as well as the synchronisation of alarms, setpoints and historian information to the central cloud service. The local device should be able to operate autonomously for a number of days until a technician can get to site in the event of a fault. Some of the local control functions can be achieved with a small PLC. In our application we are investigating a device called a RTU (remote telemetry unit). The RTU connects via a secure cellular enabled WiFi router to the closest wireless access point on a tower, and then to a cloud service via the satellite infrastructure. The RTU has a small database for local alarm, PID control and also a limited historian. The software is designed to synchronise all this information to the cloud. The system is designed to be fault tolerant to handle most of the normal connectivity outages.

The use of a RTU communicating with the cloud replaces the need for a traditional scada device, although such a scada system will be utilised at the central processing facility for more traditional control room operations. Integration of the cloud-based service with the on-site scada will make sure that field control and the central processing equipment are handled in a common interface for the operators.

The availability of detailed operational data from each well in the cloud allows geologists and engineers to analyse, consolidate and optimise operations remotely. Specialised modelling of the gas flowrates, wellfield performance, coaled permeability and so on can be done outside the country, all from a common cloud database.

This project has recently illustrated to me that the concepts of IoT, edge computing, cloud-based supervisory control, and cloud-based AI, analysis and advanced visualisation are not just abstract concepts for advanced applications in first-world countries. A modern control engineer needs to be familiar with all of these concepts in order to take advantage of these technologies to solve real world challenges. Hybrid systems that involve localised control and automation in combination with cloud based supervisory control systems are likely to become quite prevalent, not only in the energy industry, but across many other similar applications in remote locations.

Festo TechTalk: Energy efficiency thanks to smart products
This year’s TechTalk focused on smart products that help companies to produce energy efficiently, educational measures that empower employees for lifelong learning as well as for the digital working world and, of course, the Bionic Projects 2020. The panel consisted of four Festo experts, Dr Frank Melzer, member of the management board Product and Technology Management, Dr Hans-Jörg Stotz, member of the management board Festo Didactic SE, Karoline von Häfen, head of Bionic Projects, and Marcus Stemler, product manager of Festo Motion Terminal. These experts gave answers on how customers can be supported during the industrial transformation period.

Digitalisation helps to save energy
Dr Frank Melzer answered how digitalisation could help save energy. He explained how we collect, visualise and evaluate data thanks to smart products. "Only those who have process transparency will be able to carry out optimisations in terms of energy efficiency," he emphasised. Marcus Stemler made a concrete example by elaborating on how the Festo Motion Terminal, Festo’s digital valve terminal, helps customers to reduce their energy consumption.

Know-how is the key to success
"The smart Industrie 4.0 products can only work to their full potential if the employees that work at the customer’s plants are trained to apply them professionally," said Dr Hans-Jörg Stotz as he explained the approach of Festo Didactic SE. He also gave a few examples of digital educational measures in the field of energy efficiency: “With our CP Factory, we reproduce a real Industry 4.0 production environment where apprentices, students and employees can learn. Festo Didactic SE even offers learning material for primary school children. With our Bionics4Education learning construction kit, we are already getting even the youngest children worldwide excited about technical topics". He also presented the Bionic Flower for the first time in TechTalk.

Bionic Learning Network: autonomous and self-sufficient assistance system
Karoline von Häfen presented the BionicMobileAssistant, which moves autonomously in space and can independently recognise objects, grasp them adaptively and work on them together with humans. The processing of the acquired information is performed by a neural network that has been trained in advance using data augmentation. The mobile assistance system is modular and consists of three subsystems: a ballbot, an electric robot arm and the BionicSoftHand 2.0 – a pneumatic gripper inspired by the human hand. The animal kingdom served as a source of inspiration for the second project she presented, the BionicSwift, an artificial bird that can fly as a flock in a defined air space using a radio-based indoor GPS.

For more information contact Festo South Africa, 27 86 003 3786, marketing.za@festo.com, www.festo.co.za
The IIoT powered village

Creating power solutions that brighten the lives of remote communities.

It may be difficult to imagine life without electricity, but in South Africa, rural villages have lacked a reliable source of electricity for a long time. Many villages are not even connected to the power grid because they are so far from any electrical infrastructure, that connecting them would be extremely expensive. Also, with so few users, the revenue generated wouldn’t be able to cover the expenses required for maintenance alone. Unfortunately, this lack of power significantly impedes economic growth, corporate investment, governmental activities, and development for these communities.

The Naledi Trust community in the Free State is a perfect example of this. With only 34 households, economic growth is difficult without reliable power, and unemployed residents wandering the streets can lead to public safety issues. In order to address this, the South African government initially tried installing solar panels for each household. However, this attempt ended in failure. Due to poverty and the high unemployment rate, the solar panels were stolen and sold on the black market. Determined to find a solution, the government initiated a two-year programme to develop an off-grid sustainable power solution for remote villages.

An off-grid power solution would be ideal. It would allow communities to be powered by electricity generated by a centralised local facility rather than relying on a remote power station. This would eliminate the cost of building and maintaining infrastructure to connect to a power grid hundreds of miles away.

This led the government to investigate Chung Hsin Electric & Machinery’s (CHEM) hydrogen fuel cell system. CHEM’s ME2 fuel cell system can generate up to 15 kW of clean energy, and peaks of 70 kW with the support of batteries. This is sufficient to supply power for all 34 households in the community. Additionally, because fuel cell systems are large and can weigh over 300 kg, theft of the system would be difficult.

Two challenges remained. First, operation and maintenance costs would be high. Second, the initial investment cost would be high, especially when compared to traditional diesel generators. To overcome these, CHEM partnered with Moxa to augment the system with IIoT capabilities, transforming both CHEM’s fuel system and its business model.

Reducing operation and maintenance costs

In order to ensure reliable, 24/7 access to electricity, regular deliveries of methanol fuel would be required. Additionally, the system would be installed in a harsh outdoor environment and would need regular inspections. Due to the remote nature of the community, the costs of fuel delivery and site visits would be high.

Adding IIoT capabilities to CHEM’s fuel cell system turned the situation around. By integrating Moxa’s cellular remote I/O solution, real-time operational data could be sent to a control centre. This allowed for detection of low fuel levels, which helped CHEM optimise the logistics of fuel delivery. Also, remote maintenance was now a possibility. System status could be monitored at any time, and basic issues could be resolved remotely. Maintenance personnel would only need to make site visits when necessary. Empowering the system with IIoT capabilities resulted in a 50% reduction in deployment and maintenance costs.

Reducing initial investment costs

As a clean energy source, fuel cell systems have a much higher cost compared to diesel generators, which can act as a barrier to entry for many customers. But, once the system is enabled with IIoT connectivity, usage can be monitored remotely. Data on power consumption, voltage, ambient conditions, power supply operating time, fuel levels, and more, can be accurately tracked from a control centre. “The IIoT is transforming our business model,” says Amy Liao, director of the Hydrogen Department at CHEM. “We are transitioning from selling a product to offering Machines-as-a-Service. Through this business model, CHEM can now establish long-term business relationships where it charged for actual power consumed, rather than for sale of the system itself. Eliminating this barrier to entry gives the company access to a much larger customer pool, and new revenue streams.”

The lives of people living in the Naledi Trust community have been transformed. Reliable power brings new commercial and economic activity, and education and government services can keep running. “It’s my sincere wish that our IIoT solutions bring light to all the remote villages in the world, changing it for the better,” concludes Eddy Lin, general manager of Moxa’s Intelligence Business Group.

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Are you struggling to operate your plant efficiently during the Covid19 surge? This pandemic will pass, but the world will never be the same. Digitalisation has accelerated globally due to this unforeseen event, and it is likely to remain and expand even more in the future.

Everyone is talking about the new normal, a shift that is forcing companies to adopt a digital strategy, one way or another, in order to remain relevant and competitive in these unprecedented times. Many plants are experiencing a reduction in production quality due to the difficulty of managing operations with fewer people on site, and no smart data from the field.

At Endress+Hauser we provide IIoT solutions to help customers operate their plants successfully and with ease, anywhere and at any time. To help you understand the concepts of the IIoT this article will take you through the basics of how it all fits into the world of automation.

What is cloud computing?
First of all, it is important to know what cloud computing is and why it is so topical. There are many cloud computing definitions, but they all boil down to the same thing. According to Microsoft: “Simply put, cloud computing is the delivery of computing services – including servers, storage, databases, networking, software, analytics, and intelligence – over the Internet (the cloud) to offer faster innovation, flexible resources, and economies of scale.”

A cloud solution offers more than just data storage and power. It can serve an application by providing or using the service models defined by NIST: SaaS (Software as a Service), IaaS (Infrastructure as a Service), and PaaS (Platform as a Service).

There is no turning back. Digitalisation is happening everywhere and it won’t stop at your field devices. Since it is so easy to implement an Industrial Internet of Things solution without making significant changes to your instrumentation or automation concept, you will want to do it too.

Netilion – a good example of cloud computing
Netilion is Endress+Hauser’s IIoT cloud which provides a variety of smart services for end users. Each service brings real benefits for an application or industrial branch. To connect your plant to the cloud you would require an edge device. Imagine having a HART communication network in your plant, and then ask yourself how you could access the data from outside. An edge device is the network component responsible for connecting your local area network to an external and wide area network, where you can collect data from everywhere. Moreover, it doesn’t matter if you have a proprietary or non-proprietary network; the edge device is responsible for providing the local information to an external network. If you have different protocols, it also translates this information, making the connection between both network boundaries.

For example, Netilion Analytics is responsible for connecting your assets to the Netilion analytics service. It organises them and brings clarity and transparency to your plant and provides powerful insights into your installed base. Netilion shows us how powerful cloud computing is and how it can provide different services using an IIoT cloud-based solution.

Cloud computing security
The issue of security is always a sore point when it comes to cloud computing. The Netilion ecosystem conforms to high-level standards such as ISO 27001 (Information Security Management), ISO 20000 (Service Management System) and ISO 9001 (Quality Management System) to ensure that your data is secure. In addition, all data security follows the requirements of GDPR. The servers are located in Frankfurt and Dublin, providing an additional level of cybersecurity.

Seven advantages of cloud computing
Cloud computing can save costs
In general, new solutions always raise questions with customers. One of the most common is what is the initial cost of implementation? Usually, a traditional solution in the automation world will be a high-cost investment and it takes several years to generate a return. When it comes to cloud computing, the investment is much lower than that of a traditional solution. In addition, the only connection you need between your assets and the cloud is an edge device. The edge device connects to your field devices via digital communication, e.g. Profibus or WirelessHART, and provides a safe, one-way connection between the field and the cloud.

Cloud computing increases team collaboration
All the information about your assets is in the cloud and your entire team can access it by working together on a collaborative platform. Traditional solutions are organised in silos, and don’t create a transparent environment for teams. In contrast, cloud computing creates transparency for everybody. An integrated solution with a collaborative platform and an excellent user interface can save time and create a more
Industry 4.0 ToolKit from ifm

Never before has it been so important to facilitate the collection and use of relevant and important data. Optimum insight into systems and processes makes it possible for users to take the optimal decisions about maintenance and production required to ensure that the requirements of tomorrow are met efficiently. Discover the unique ‘digital tool case’ from ifm, full of practical solutions for the digital update of process machines. It starts with IO-Link capable sensors and extends through all levels of production and company control, step by step.

Get information from data
In the IIoT, installations and machines are in contact with each other. In the cloud, each machine can be represented by a digital twin in a virtual factory. Even if they do not use the same language due to their own control systems, one establishes the connection to the virtual factory in order to get information from the data. For example, details on the state of the machines, on required maintenance, on potential to increase productivity, on options to save energy, and more.

Here is the practical approach
From individual sensors to the overall business solution, ifm’s offerings are scalable so that the digitisation of your company is implemented in steps, according to your wishes. Industry 4.0 is feasible and with the right partner it is easier than you think.

Being a specialist for automation technology with 50 years of experience in industrial manufacturing, ifm is your partner for the introduction and implementation of tailor-made digitisation solutions on the journey to Smart Factory. Sound hardware and software competence together with visionary ideas guarantee your continuous progress. Cooperation starts where added value can be generated for directly:

• Competitive advantages and growth opportunities.
• Reduced costs.
• Increased efficiency and effectiveness.

Cooperation starts where added value can be generated for directly:

The IIoT-ToolKit from ifm allows a continuous flow of information from the shop floor (machine infrastructure) to the top floor (IT infrastructure). The process, machine and diagnostic data provided via IO-Link can now be read, evaluated and diagnosed in detail using ifm’s software solutions. With minimal effort – even possible during operation – the ToolKit enables users to trigger and control follow-up activities and processes as appropriate.

For more information contact Natlee Chetty, Endress+Hauser South Africa, +27 11 262 8000, info.za@endress.com, www.endress.com

Cloud computing gives you access from wherever you are
Everything is in the cloud, meaning no matter where you are, independent of the type of device you are using, you have secure access to all the information and can receive notifications wherever you are.

This gives many advantages, for instance the ability to react to a situation faster than if you were using a traditional system.

Cloud computing provides better document control
Technical documentation can be a problem. Picture yourself in a situation where you have the wrong version of a document, or you can’t find it online. Cloud computing supports your team by having all documents in one place. Your team can share and create documents, facilitating access and saving time. A report, accessible to team members, can be generated and stored in the cloud for all interactions, such as calibration or maintenance.

Cloud computing has high-level security
We have already touched on the safety topic and how the cloud follows legislation and standards to provide high-level security for information. In addition to this, all messages exchanged between edge devices and the cloud are encrypted.

Cloud computing offers automatic software updates
When you have an IIoT cloud, the service provider will take care of all the updates. Your team need not worry about backing up the database or any problems regarding software, as everything is automatic. This situation is different to standard software solutions. Thanks to the IIoT, you can now avoid the pain of updating.

Cloud computing increases the power with knowledge
Cloud computing gives you access to critical information from your field devices, which your team can access. The knowledge and transparency created by the IIoT cloud will empower your team to avoid downtime, ultimately saving time and money.

A glance into Netilion cloud
The Netilion IIoT ecosystem allows intelligent and networked applications that provide a variety of services as listed below:

Netilion Analytics
Netilion Analytics gives you a transparent view of your plant through access to a simple overview of all devices installed. This view can also alert you if any device needs to be replaced. Furthermore, the insight page provides you with powerful information of your assets in the form of dashboards. You can register your devices by taking a picture and adding a few details to create a digital twin, or install an edge device automatically.

Netilion Health
Netilion Health gives you an overview of the health of your field devices. You can track all the health information of your assets with a graphic overview of when events occurred, as well as diagnostic information.

Netilion Library
Netilion Library allows you to organise and save all your working files and documents in the cloud. It helps you find documentation, such as operation and maintenance files quicker. Moreover, the library is environmentally friendly as the information is online and available wherever you need it.

Netilion Smart Systems
Netilion Smart Systems are intelligent and compact systems for specific applications, such as surface water and aquaculture. These solutions are plug-and-play with remote access via a user interface.

Now that you are ready to digitalise your plant, visit netilion.endress.com for a free trial.

INDUSTRIAL INTERNET OF THINGS

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www.instrumentation.co.za July 2020 25
The newly developed VX IT rack system from Rittal is a modular system for server and network racks. It allows IT infrastructure to be set up with previously unattainable speeds – ranging from individual network racks to complete data centres. The system offers maximum configuration freedom, with configuration performed using an online tool fully certified with all components.

**Introducing a new generation of IT racks**

Conceived as a universal modular system, the VX IT has been designed for all common applications and its versatility makes it suitable for use as a network and server rack. The large selection ranges from 15 to 52 U in height and customers can deploy it to provide edge installations, corporate data centres with suite climate control, modular IT containers, energy-efficient colocation data centres and large hyper-scale data centres.

Combining years of experience across numerous IT projects, the VX IT stands for speed, flexibility, and modularity. According to managing director for Rittal South Africa, Adrian Buddingh, this innovation allows customers to prepare for every IT scenario. “As your needs change, so does the VX IT. It’s ever-evolving and is designed to meet the demands of the IT industry both now and in the future.”

**Faster selection and ordering**

“An online configurator guides customers through the selection of components and also performs a plausibility check,” explains Buddingh.

“The entire process, from selection, configuration, ordering and right through to delivery is digitally supported and transparent. During the configuration process, a 3D model is built up, complete with accessories. Once finished, the model is available for the customer to use.

“All VX IT variants designed with the configurator have already been tested and certified in accordance with international standards such as UL 2416, IEC 60950 and IEC 62368. Based on this, customers require no additional certification for the fully configured system. With this solution, IT managers can save valuable time in planning and procurement, while at the same time being assured that all the components work in perfect harmony.”

**Rapid tool-free assembly**

“Anyone working in a data centre will want a well-designed and easy-to-use solution,” adds Buddingh. “Rittal has consistently followed this principle in developing the VX IT. The IT rack is installed largely without tools using time-saving snap-in technology.”

The height units and pitch patterns are marked, which makes it easier to set the 19-inch distance between levels. All the panels such as side or roof panels are attached quickly and easily using snap-in fasteners and positioning aids.

The new vertically split side panels, available as optional accessories, provide users with improved access to accelerate installation work and service. The vertically divided side panels are fitted with simple hinges, which means that they can be opened like doors and yet are still easy to remove. Horizontally divided side panels are also available; these also simplify access, for example to servers.

Another key feature is the rack’s great stability: Thanks to an improved 19-inch frame design, it has more vertical stability than its predecessors. Two variants are available: The VX IT standard rack variant permits a static load of 1500 kg in accordance with the Rittal test procedure or 1200 kg in accordance with UL certification. The dynamic version permits a load of 1800 kg in accordance with Rittal test procedures, or 1500 kg in accordance with UL certification.

**Everything a rack requires**

A wide range of accessories are available for the VX IT, allowing it to be individually configured. These include options for the doors, side panels, floor and roof, as well as such innovations as the new LED strip for status display. Further accessories include pull-outs and cable management tools, as well as solutions for monitoring, power supply and asset management in the IT rack.

“Components such as PDUs, UPS systems, IT cooling systems and monitoring solutions are also available for interior installation, as are modules for early fire detection and extinguishing,” concludes Buddingh.

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The administration of digital twins

In order to access the virtual representation of the sensor and its data, SICK Automation uses LiveConnect to deliver a standardised connection from an edge gateway to SICK Asset Hub. This visualises the sensor status, thereby providing a foundation that opens up new opportunities for optimising plant availability and process efficiency.

“Today, customers come to us with problems that have nothing to do with traditional automation engineering, but involve sensor systems, logic and actuators,” explains Christoph Müller, senior vice president for product management at SICK AG. “Instead, they want to make business processes more efficient. Sensors gather data that can help solve this problem.”

LiveConnect – connection into the cloud
Industry 4.0 thrives on the generation and linking of data. LiveConnect provides a data connection to the sensor for web services and Industry 4.0 applications, thereby making new business applications possible – for example, the monitoring of ship emissions as evidence of adherence to legal requirements.

In order to access the virtual representation of the sensor and its data, SICK uses LiveConnect to deliver a standardised and secure connection from an edge gateway, like the SIM1012, to SICK Asset Hub or other SICK or third-party applications. The LiveConnect web service connects the hardware, a SensorApp, and a cloud instance. This creates a connection between the sensor-oriented shop floor (SICK AppSpace) and the SICK IntegrationSpace cloud environment.

Asset Hub – making added value visible
The Asset Hub from SICK is a digital, web-based enterprise asset management (EAM) system. Thanks to the functionally rich and interactive view the Asset Hub provides of the individual sensors and machines, as well as the plant as a whole, it creates more transparency in the value chain. This new transparency via virtual images, digital twins, and assets – along their entire life cycles – enables greater plant availability and process efficiency. Data is evaluated in the Asset Hub to deliver valuable information about required inventories, maintenance, the right time for software updates, or the availability of devices. For example, the SICK Asset Hub service module offers services for maintenance employees and enables them to access sensor maintenance schedules and certificates, among other things.

The Asset Hub provides a flexible foundation for further asset-focused digital value-adding services from SICK, for example the Installed Base Manager, LiveConnect, Monitoring Box, or SICK Service Module.

IntegrationSpace – all digital solutions on a single platform
Asset Hub and LiveConnect are components of the SICK IntegrationSpace, which provides all the basic services and features required to offer digital services.

For more information contact Grant Joyce, SICK Automation Southern Africa, +27 10 060 0550, grant.joyce@sickautomation.co.za, www.sickautomation.co.za

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Completing the remote maintenance circle

What do the world’s machine builders want from a next generation remote maintenance solution? Secomea has been listening to thousands of them and has spotted a pattern. In this collective vision the company sees an opportunity to provide a solution offering true value for all levels of the automation industry in a single, secure and scalable solution – the Data Collection Cloud (DCC):

- Addresses all data-collection needs.
- Combines data collection and remote access in a single device.
- Combines real-time and OEE data visualisation.
- Easy to setup and administer.
- Future-proof.
- Secure.

Corrective maintenance: for many years, the Secomea solution has been acknowledged as a leading technology for secure remote access for corrective maintenance. The DCC solution now expands and completes this cycle for preventive and predictive maintenance.

Preventive maintenance: DCC lets users organise information within real-time, condition monitoring dashboards. Data is collected via the SiteManager IoT gateways, which operate simultaneously as tunnelling peers for decentralised scada systems. The system gives fully automated process control.

Predictive maintenance: DCC lets users focus on their OEE, by managing and visualising production batch data in customisable dashboards or via APIs. The Secomea SiteManager IoT gateways even submit the same data concurrently to other cloud systems for further analysis.

Easy data visualisation: DCC makes it easy to monitor and compare data collected from all devices. It also lets users build analytical dashboards for viewing on a PC or smartphone.

Intelligent data selection: Data collection shouldn’t mean sending all data to the cloud unconditionally. To reduce transfer rates, avoid handling irrelevant material and minimise cloud storage, collected data should be processed at the edge point.

Flexible role management: the DCC follows the same flexible role structure used for the Secomea Corrective Maintenance solution’s GateManager. It lets users create administrator and user roles to support your preferred process flow, while maintaining secure control over access to configuration and data.

SiteManager IoT gateways: single-step USB configuration and auto-detection of Ethernet and USB devices makes setup a breeze. With a wide choice of usability features and Internet connection methods, SiteManager gives seamless connection to any remote device.

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Data networks are frequently compared to road traffic. In this image, the cables are roads and motorways, and the switches represent crossings and motorway junctions. The task of the switch is to combine the data of many Ethernet stations on a main cable. The main cable can normally transport more data per second than the individual feeder lines.

Just like road traffic, data traffic is also constantly increasing. This development can be observed in office IT, in private households as well as in individual networks and operational technology (OT). The convergence of OT and IT is also boosting the increase of data streams. These must be ordered and distributed by switches. These consist of passive so-called ‘unmanaged’ switches or active ‘managed’ switches. While unmanaged switches basically only combine cables, managed switches actively control the data flow, prioritise it, assign IP addresses if necessary, establish redundant connections and secure the access to networks using firewalls.

Efficient wiring with IP67 switch
As an IP67 specialist, Turck has for some time been making possible out-of-the-cabinet decentralisation of automation technology. Besides the conventional I/O modules for connecting digital or analog signals or IO-Link devices to Ethernet networks, controllers and spanners for translating between Ethernet languages have also been set free from the control cabinet. The wiring and flexibility benefits arising from decentralised cabinet-free installation also apply to switches. Ethernet cables to the stations do not have to be routed individually from the control cabinet, but are only routed at the machine to the stations over the last metres. Depending on the system topology, the decentralised positioning of the switches saves considerable wiring effort.

Drag chains, redundancies, safety
Of course not every system requires a switch or several switches at the machine. Connecting stations with linear structures are certainly a major benefit of fieldbuses and Ethernet networks. In many cases, however, a star structure is required and so a switch is necessary: on drag chain applications, for example, it is highly impractical and laborious to route Ethernet cables at the end of the drag chain as a line. Several ports are likewise required when creating ring redundancies. The increased availability requirements placed on machines are another reason. Ring or star structures offer the highest level of reliability. With star structures, each station is connected to a separate port of the switch. Different line structures can be created via switches according to the particular machine architecture.

1 Gbps high-speed backbone and port-based IP address assignment
Turck’s new 10-port switch in the proven TBEN-L block module design offers 100 Mbps on eight ports and 1 Gbps on two high-speed backbone ports. The switch in the robust IP67 design is unique. It optimally meets the requirements of high-performance industrial applications in harsh environments. Users can assign the IP addresses to stations either by port or centrally via the web server of the switch. This saves the user having to make separate configurations for each individual station. For series machine builders and users integrating machines in higher-level networks, the switch with NAT routing offers higher-level systems the possibility to assign proxy IP addresses and thus prevent the doubling of IP addresses in networks. The embedded firewall ensures managed and, above all, secure data exchange for the integration.

High-speed tool changes with quick link-up times below 150 ms
The fast link-up time is a requirement which many industrial switches fail to provide. The ability to establish connections to stations in the shortest possible time is much more critical in industrial automation than in home or office IT scenarios. This must be carried out in fractions of a second, particularly with tool changes such as for car body manufacturing in the automobile industry. If there is a switch between the controller and station, the deployment of the tool not only depends on the startup time of the Ethernet station on the...
Many machine builders and systems integrators looking to transform their business models have identified machine and plant process data as being a core fundamental. When it comes to tailoring new data-driven services to individual customer requirements, however, they need solutions that are as cost-efficient as possible. Here, keeping the engineering simple is a key factor. TwinCAT Analytics supports this kind of Engineering 4.0 approach with the One-Click Dashboard, which reduces dashboard creation to a simple mouse click.

With One-Click Dashboard, all it takes for users to generate an entire HTML5-based analytics dashboard based on the PLC code and to load it into a selected Analytics Runtime container takes a simple mouse click. When the process completes, users receive a network address that they can then use to access the dashboard in a web browser. This ability to generate dashboards without the need to write a single line of code or design graphics is a huge time-saver within the engineering process.

Based on TwinCAT 3 HMI, the new functionality provides at least one HMI Control for every TwinCAT Analytics algorithm, each with an up-to-date tile design that follows the latest web standards. The controls contained in a dashboard can be selected individually in an algorithm’s properties with the aid of a control preview. Users can also combine multiple algorithms within an individual HMI control.

Generated automatically, tailored individually
Automatically generated dashboards can be customised by configuring individual user settings. For instance, users are able to pick their own header colors and logos, and can even choose to show geographically distributed machine locations on a world map. In addition, the controls are available in a choice of layouts and themes as well as multiple languages. It is also possible to switch between light and dark themes, and to automatically set links to methods that reset the algorithms.

Despite this high level of flexibility, dashboards that are created automatically may not always meet every user’s needs, so when TwinCAT 3 HMI projects are generated, they are integrated into Visual Studio as well. This enables users to adapt their dashboards to their requirements in the graphical editor. Even with dashboards that need extensive customisation, the engineering process still involves far fewer clicks than the conventional approach, saving significant time and expense.

For more information contact Dane Potter, Beckhoff Automation, +27 79 493 2288, danep@beckhoff.com, www.beckhoff.co.za

Wave breakers for broadcast and network load monitoring
Ethernet stations can send so-called broadcast requests which are directed to all stations of a network. These broadcast waves can put switches and other devices at the limits of their capabilities. The integrated broadcast storm protection reduces these kinds of network load spikes.

Virtual networks can also be set up for control via broadcast domains. These VLANs can then be used like individual networks and configured with VLAN-specific bandwidths. Broadcast requests are thus only functional in the virtual LAN. VLANs are also used to separate production and management data, which in turn effectively protects the availability and security of the production network. The network load monitoring of the switch helps on all ports to diagnose impending overloads early on and makes it possible to make predictive interventions.

Conclusion
A compact and powerful switch like the TBEN-LSE-M2 is new on the market. The combination of protection types up to IP69K and high-speed backbone with two Gbps ports is ideal for depicting the increasing networking of ever higher data rates in industrial networks. With fast link-up times below 150 milliseconds, the switch offers the highest cycle rates for tool changers in robot technology.

The user also benefits from the several functions for the safe and efficient organisation of industrial Ethernet networks. The integrated firewall therefore offers bidirectional protection from unauthorised access and thus reliably increases security in IIoT. This is in addition to the NAT routing capability or the possibility to set up virtual LANs.

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

www.instrumentation.co.za  July 2020  31
Mobile robots speed production at new smart factory

Showcasing flexible production in real life, a new ‘Smart Factory’ in Norway uses a variety of robots in a system developed and implemented by system integrator Intek Engineering.

A dozen industrial robots, each in individual workstations or cells, perform different steps in the manufacturing process. However, to attain the high efficiency, safety, and convenience of a modern smart factory, Intek Engineering needed to link the cells together in an intelligent way. The company chose Omron’s LD mobile robots and Enterprise Management software to achieve this.

“The manufacturer wanted a flexible production solution that could deliver very high efficiency and low changeover times,” says Sølvar Flatmo, chief strategy officer at Intek Engineering. “Combining our experience in flexible production equipment with technology like the Omron LD is a game changer for creating flexible and customisable production lines that can be reconfigured and even changed on-the-fly during production. For high-efficiency production, keeping the robots working continually is a requirement and for this line, fast changeover times and minimal downtime are essential.”

High speed precision

Omron’s LD robots travel at an impressive speed – up to 1.8 m/s. Yet they easily move their 85 cm wide body in and out of the 95 cm robot cells without any trouble. Thanks to their double guide sensors, using special magnetic bands in the floor, the robots can align themselves with millimetre precision. It is this accuracy that helps accelerate production processes.

In addition to their speed and accuracy, LD robots can operate in areas that could be hazardous, or even dangerous, for personnel such as those working in refrigerated stores or heated rooms. They are also ideal for cleanroom facilities such as in semiconductor or pharmaceutical markets where the presence of human operators could contaminate the process.

Supporting production cells

The production line in the new factory uses eight LD robots to support the production cells. The mobile robots are controlled by Omron’s Enterprise Manager, which plans and coordinates all movements in the system. It acts as the central brain – a robot within a robot. It is given the ‘map’ of the production system and it decides which robots go where, based on several factors from position to battery level, aimed at maximising efficiency. Like the rest of the system, the Enterprise Manager acts fast, making decisions on the fly so no time is lost.

Together, this delivers high overall efficiency. The Enterprise Manager ensures that a mobile robot is always waiting to pick up finished production from a cell and move it to the next stage. It also checks if a robot needs to charge, so will send a robot to the charging station, even for just a short period during operation, to give a battery a charge boost. Obviously, during scheduled downtimes, it will send all the robots to charge.

The Enterprise Manager also makes it easy to expand an installation with additional robots. When a new robot is added, it does not need any additional programming. The Enterprise Manager simply adds it to its available pool and gives it instructions on where to go.

Safety first

The industrial robots at the plant operate at high speed which means that it is dangerous for personnel to enter the production cells while they are in operation. Therefore, each cell has a laser screen that can detect if someone enters the cell, and automatically shuts down the system. However, the LD robots also need to enter the cells to take the products to the next production stage. As a result, the Enterprise Manager can inform the cells when a robot is about to enter, so that it does not trigger an emergency shutdown when the robot passes through the laser screen.

When moving between cells, the robots use their own sensors to detect if a person or object is in their way and will move around obstacles or stop to let people pass by. So, even though the fully automated production line only needs a few operators and maintenance personnel to run, these can safely work in the same spaces as the LD robots.

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Danfoss addresses the challenges in water and wastewater applications

As the world population rises and people pursue higher standards of living, more water is needed in homes and for the production of food and other products. By 2050, the United Nations projects global water demand to increase by 55%. However, freshwater supplies are limited, and groundwater, which is the source of drinking water for at least half of the global population, is used much faster than it is replenished. In just 10 years, 50% of the global population is expected to live in water-stressed areas.

Danfoss has solutions which help countries and municipalities worldwide save water and energy within water supply, wastewater treatment and irrigation of farming areas. For example, the company has supported Denmark in becoming one of the pioneering countries in the water and energy field. The country has grown its economy by 80% since 1980, while reducing water consumption by nearly 40%, and keeping energy use at the same level. Structured water management and innovative technologies have contributed to this decoupling of economic growth, water consumption, and energy use.

Electricity and heat production
In municipalities, water and wastewater facilities account for the largest consumption of electricity, typically 25-40% of the total power use. In the Danish city of Aarhus, a local water company has managed to transform a wastewater facility from being just a wastewater plant into also functioning as a combined heat and power plant, delivering an energy surplus. The plant produces 90% more energy than it consumes. The excess heat is led into the district heating system in the city, thereby reducing its carbon footprint. This is feasible thanks to advanced process optimisation and by using more than 140 variable speed drives from Danfoss as control handles on almost all rotating equipment. Done optimally, this also creates the maximum amount of sludge and carbon. In a digester, this is transformed into gas used for both electricity and heat production.

“It’s a ground-breaking innovation that shows what is possible with advanced process control,” says Ferdie Fortuin, sales manager, general industry, at Danfoss Drives South Africa. “As far as we know, no other country has managed to get a water treatment plant to actually produce so much additional energy based on normal household wastewater. It means that the huge energy consumption from water and wastewater facilities could be avoided, turning the single largest electricity consumer in municipalities into an energy-neutral party.”

The case has attracted attention in cities worldwide. At the beginning of 2015, Aarhus Water signed a cooperation agreement with the water supply company in Chicago (MWRD), which faces the same kind of challenges and pursues the same goals. With the agreement, they have started to share knowledge about water technologies, climate adaption and energy neutrality.

Irrigation of farming areas
When it comes to water supply and irrigation of farming areas, another huge potential is the reduction of water losses in pipework due to leakage. According to the international consultancy firm McKinsey, $167 billion is wasted every year due to leakage in cities around the world. However, leakages can typically be reduced by 30-40% using technologies like variable speed drives and sensors, which control the pressure in the pipes to avoid water flooding out of holes.

“The global water and climate challenges are a difficult code to crack, but the solutions to meet them are ready and we also see that focus on leakage reduction and energy efficiency is increasing,” explains Fortuin. “Last year, we experienced double-digit growth in our water and wastewater business, and the positive trend continues.”

Besides saving water and energy in countries and municipalities, Danfoss is also helping produce drinking water in remote locations like islands, drilling platforms and cruise ships. Here, Danfoss takes part in turning seawater into drinking water using advanced high-pressure pumps and energy recovery devices for desalination systems. The Danfoss solutions save up to 50% energy, which is important for the deployment because around 70% of the total costs in desalination systems are related to energy use.

Fortuin concludes: “The World Economic Forum ranked water crisis and failure of climate change adaption among the top 5 global risks and encouraged decision-makers worldwide to take collective action to address them. There is no reason to wait. Well-proven solutions, which meet the water and climate challenges, are ready and they are paid back fast.”

For more information contact Lynne McCarthy, Danfoss, +27 11 785 7628, mccarthy@danfoss.com, www.danfoss.co.za
BMG’s specialist solutions for industrial water infrastructure

BMG’s solutions for the water, wastewater and sewage sectors encompass the supply of quality branded drive systems, enhanced by the BMG team’s technical expertise and installation, condition monitoring, maintenance and engineering support capabilities.

“BMG specialists play an important role in upgrading ageing water and wastewater facilities and designing new drive systems to ensure a dependable infrastructure,” explains Kelly Mac Iver, gears business unit manager, BMG electromechanical division.

“The selection of robust equipment that can endure continuous operation under severe conditions is critical. Every drive package selected must match the application perfectly, to ensure energy efficiency, low running costs, minimum downtime and extended service life of the system. Care for the environment is also a priority, and for this reason, we select environmentally friendly drive solutions that help minimise carbon emissions.”

BMG supplies an extensive range of drive packages from Nord Drivesystems and Sumitomo Drive Technologies, which have been designed especially for optimum efficiency in harsh applications, including water, wastewater and sewage treatment plants.

The Hansen product range

Sumitomo’s Hansen product range includes gear units that drive aerators, water screws and brush aerators. Notable features of the locally assembled Hansen agitator/aerator gearboxes include the flexibility for application-specific product design to meet exact requirements, high torque capacity, surface durability and low-noise performance. Robust weatherproof housings raise the gearbox and drive motor above the service platform, to prevent contact with water.

The internal construction of the gear unit housing allows for simple and complete oil drainage, while Hansen’s Oil-Lock and Oil-Guard systems offer maintenance-free sealing on high-speed shaft extensions. The drywell prevents oil leakage on vertical downshafts. Larger units, with inspection covers above the oil level, allow for convenient inspection of internal components on site.

Nord drives

Nord drives have special features to meet the requirements imposed during water treatment procedures.

“The drives consist of gears, motors and brakes that are protected against corrosion. Special covers for the hollow shaft and motor also ensure that the drive is entirely resistant to spray and the humid and aggressive conditions to which they are exposed in sewage treatment plants,” says Deon Crous, national product manager, Nord Drive Systems at BMG.

Explosion-proof motors, with electrical and mechanical speed controls, are fitted with anti-condensation heaters for standstill periods and reinforced bearings for extended life are standard. Special vent plugs, lubricants and a valve-type oil drainage facility also enhance performance in these demanding applications.

Drives with helical flange-mounted geared motors have the flexibility to fit into restricted and awkwardly shaped areas below tank de-sludgers. The traversing platform of this system is equipped with four-wheel drive to prevent wheels from slipping, even under load and in unfavourable wind conditions. Drives for revolving de-sludgers (helical bevel geared motors) and propeller-type agitators and aerator drives (helical geared motors, flange mounted) can comfortably handle continuous operation 24 hours a day. Foot-mounted helical geared motors are recommended in paddle mixer drives and despite heavy loads, design life can exceed 100,000 hours.

Also in BMG’s Nord range is the compact combination of Maxxdrive industrial gear units and the Sealless adaptor for mixers, which offer operating reliability and reduced maintenance requirements. Important features of these gear units for mixers include fewer wearing parts and no additional oil tank is necessary, which reduces installation space. This Nord range has earned recognition globally for reliability, efficiency, low noise levels, extended life and reduced maintenance.

BMG has made a substantial investment to ensure assembly, stockholdings and technical backup for its comprehensive range of industrial geared motors. This facility enables the quick delivery of world-class geared motor solutions in selected African countries. Full repair and maintenance services are also offered.

For more information contact
Kelly Mac Iver, BMG, +27 11 620 1615, kellym@bmgworld.net, www.bmgworld.net
Innovations and fast development characterise the production processes in the beverage and food industries, as well as in biotechnology and pharmaceutical applications. Processes in these industries are particularly demanding and specific product properties need to comply with special hygienic requirements.

Afriso components and solutions are adapted to suit specific production processes and comply with the pertinent hygienic regulations and recommendations to meet stringent requirements. The robust measuring instruments deliver reliable measurement results, and monitor and control processes from simple to highly complex. Sophisticated kit systems and innovative ideas such as the seal-free design of diaphragm seals, pressure transmitters and thermometers help in the continuous optimisation of production facilities.

As a full-line supplier with a complete portfolio in the areas of pressure, temperature and level measurement technology, the company offers a comprehensive, high-quality product range from a single source.

The range extends from pressure gauges, chemical seals and pressure transducers to a large number of electronic and mechanical temperature measuring devices and control units as well as level indicators, which, depending on the application, are based on a wide variety of measuring principles. Almost all parameters such as ranges, geometry, colour and connection can be specified according to customer requirements.

In the adaptation of these peripheral system components, the stringent directives and standards are always in focus, so that hygienic design of machines and systems is supported in an optimum manner. Afriso supports compliance with GMP (good manufacturing practices) required for the production of pharmaceuticals, food and animal feed, for example, by continuous quality assurance measures such as a constant review of the production processes.

The materials used in hygienic Afriso measuring systems meet FDA requirements for contact with food and drugs as per CFR (Code of Federal Regulations), part 21. These materials comprise metals as well as elastomers for seals or oils for transmission in chemical seals. Precision turning and polishing assure a surface quality of the wetted parts with a medium surface roughness of 0,8 µm. This surface roughness can be improved to 0,4 µm on customer request.

In closed systems, the components can be cleaned by means of CIP or SIP procedures – perfect cleanliness from the outside is attained with stainless steel housings with a degree of protection of up to IP 69. In addition to this very extensive product range, the company also offers evaluation units for its instrumentation equipment.

For more information contact Frank Altmann, Afriso, +49 713 510 2233, frank.altmann@afriso.de, www.afriso.de

Bronkhorst High-Tech has announced the availability of Ethernet/IP and Modbus-TCP interface options for its mass flowmeters and controllers, as well as its digital pressure controllers. Like the previously developed EtherCAT and Profinet communication protocols, Ethernet/IP and Modbus-TCP interfaces are based on Ethernet communication. They can therefore be applied with standard Ethernet cabling and support an unlimited number of nodes.

EtherNet/IP (Ethernet Industrial Protocol) is designed for use in industrial environments and time-critical applications. EtherNet/IP, first presented by the ODVA (Open Device Vendor Association) in the year 2000, is an open communication protocol that adapts CIP (Common Industrial Protocol) to the standard Ethernet.

The Modbus-TCP protocol is 100% Ethernet compatible and is used for data exchange between I/O controllers and I/O devices (slaves/field devices). It adapts the widely used Modbus protocol to TCP/IP with Ethernet as the common medium. Modbus-TCP is a master/slave (or client/server) system in which Bronkhorst instruments can only be implemented as slave devices.

Bronkhorst has many years of experience with fieldbus communication. With its multi-bus concept, the company offers customers an extensive choice of nine fieldbus interface options. The wide range of digital metering and control devices is applied in many different markets, e.g. the food and beverage and chemical industries, gas and fluid analysis equipment, glass and tool coating processes, testing fuel cells for the automotive industry and in machinery used to produce electronic chips, LED lights and solar cells.

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Fork sensor in hygienic design

Production sequences in the pharmaceutical and food industries are subject to extremely demanding hygiene standards. With corrosion-free stainless steel, FDA conformity and Ecolab certification, Wenglor’s P1HJ00X laser fork sensor in InoxSensors hygienic design provides maximised protection when detecting objects. The collimated laser beam allows fine quality inspection in the micro range with fork widths up to 220 mm.

Objects with sizes down to 40 µm (thinner than a human hair) can be reliably detected by the new fork sensor. Due to the collimated laser beam, objects can be perfectly detected within the entire fork width, not only within certain ranges as is the case with many comparable products.

Fork widths of 50, 120 and 220 mm, each with an optic cover made of glass or plastic, are available. These are custom tailored for the requirements of any industry sector.

The fork sensor with gap-free design is resistant to cleaning agents in hygienically sensitive industrial environments (Ecolab certified) and also complies with the highly demanding material specifications stipulated by the FDA. Liquids run off of their own accord thanks to the special hygienic design. Together with the hermetically sealed housing, captive components provide for high levels of protection up to IP69K. Beyond this, the light barrier can be easily and conveniently adjusted directly at the sensor by means of an intuitive teach-in button. To round off the system, suitable accessories in hygienic designs with watertight cable glands are available.

The packaging, paper and consumer goods sectors benefit from this product in addition to the pharmaceutical and food industries; wherever numerous objects travelling at high speeds have to be reliably detected, reproducible millions of times over. This includes detection of bottles, cannulae and syringes as well as the inspection of gaps, holes, slots and notches.

For more information contact Anastas Schnippenkotter, ASSTech Process Electronics & Instrumentation, +27 11 708 9200, info@asstech.co.za, www.asstech.co.za

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Ore sampling like never before

With the general decline in ore grades in mining, FLSmidth’s market-leading expertise in mineral sampling and laboratory automation holds increasing value to mines.

“The more you understand about the characteristics of the ore entering your process plant, the better you can treat it,” says Martin Matthysen, director, SPA (sampling, preparation and analysis), sub-Saharan Africa and Middle East at FLSmighth. “But this needs technology that can sample high volumes, maintain rapid turnaround times, and deliver quality results.”

Only then can plant operators respond to laboratory data in real time, which is one of the keys to effective plant optimisation. With over 30 years of experience, FLSmidth has been a pioneer in laboratory systems integration, as well as driving automation in the laboratory environment.

“Our particular expertise in laboratory automation is now recognised worldwide,” says Matthysen. “This is why we have supplied 95% of all automated laboratories to the global mining industry constructed over the past dozen years or so.”

The company’s offerings address all stages of mines’ sampling and analysis requirements. It designs solutions for exploration and ore characterisation, grade control, process plants and port shipment. The highest quality equipment is sourced and applied to a laboratory solution to achieve accurate sampling, effective sample preparation and detailed sample analysis.

Each laboratory design is unique, he emphasises, as it must suit each customer’s particular operating conditions and strategic goals. The design process therefore demands close collaboration with the customer and a detailed examination of mined material and process demands. This ensures that the laboratory generates exactly the type of analytical data that the plant operators require.

“With our world-class mineral research and testing facilities, we are constantly pioneering innovations that add value to customers,” adds Matthysen. “Our automated solutions also offer consistency and traceability, while improving ergonomics and eliminating hazards to laboratory personnel.”

Among the company’s innovations has been an environmentally-friendly methodology that replaces traditional wet chemistry. With no acid being used to dissolve platinum ore, for instance, the process produces no toxic waste – dramatically reducing the impact on the environment.

“We are accredited in terms of international quality standards, and work strictly to our customers’ stringent specifications regarding health, safety and environment,” concludes Matthysen. “Our expertise gives customers the confidence not only to procure laboratories from us, but increasingly to contract us to maintain and operate those facilities on their behalf.”

For more information contact FLSmidth South Africa, +27 10 210 4000, info@flsmidth.com, www.flsmidth.com

Process moisture analyser

Michell Instruments has announced that an independent report confirms excellent measurement performance of its OptiPeak TDL600 process moisture analyser. A new report undertaken by DBI Gas und Umwelttechnik in Leipzig has demonstrated that the analyser from Michell Instruments offers stable, accurate and repeatable measurements of moisture in natural gas and is not affected by changes in background composition.

A total of 16 different experiments were carried out to test the instrument’s capabilities in a range of background gas compositions, comprising energy-rich H-group natural gas as well as pure methane. The evaluation involved different target levels of moisture together and further testing to determine any influence from the addition of associated gas components hydrogen, hydrogen-sulphide and methanol. Test conditions closely mimicked varying process operating scenarios in gas processing and pipeline transmission.

The report’s author, Dr Rico Rockmann, commented that overall the Michell TDL600 displays very stable values, without outliers or incorrect measurements.

The OptiPeak TDL600 uses the latest generation of tuneable diode laser spectroscopy sensors to detect trace moisture in natural gas, down to 1 ppm. Since it uses a non-contact sensing technology, it is resistant to contamination and produces fast, reliable results in challenging applications such as changing methane concentrations and sour gas.

For more information contact Instrotech, +27 10 595 1831, sales@instrotech.co.za, www.instrotech.co.za
Emerson has released Micro Motion ProcessViz, a standalone, cost-effective software solution for flowmeter process data visualisation. Having an instant visualisation of raw process data translates into direct actionable information, helping plant operators in the chemical, food and beverage, and oil and gas industry reduce the time needed to identify a problem in the flow process. Ultimately, this can potentially save a facility money by reducing the need for stoppages or shutdowns to trace the source of a problem.

The new software supports the Micro Motion Coriolis transmitters with data historian output capabilities, such as the 5700 and 4200 models, and provides a snapshot of a moment in time in the flow process. A technician or plant manager won’t need to manipulate data to see what is happening in the flow. The data is available in a usable format that allows the user to identify and analyse process issues.

“We created ProcessViz after our customers saw us using it to diagnose their flow problems,” said Ron Fleissman, software product manager for Emerson’s Automation Solutions business. “We received so many requests for this software that we realised there was a need in the market for a tool that would make it easier for our customers to diagnose process issues that might be caused by changes in the flow, thereby saving them time and money.”

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

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Loop Signatures 2

The two classes of processes.

Michael Brown is a specialist in control loop optimisation with many years of experience in process control instrumentation. His main activities are consulting, and teaching practical control loop analysis and optimisation. He gives training courses which can be held in clients' plants, where students can have the added benefit of practising on live loops. His work takes him to plants all over South Africa and also to other countries. He can be contacted at Michael Brown Control Engineering, +27 82 440 7790, michael.brown@mweb.co.za, www.controlloop.co.za

This article will discuss the two classes of processes called self-regulating and integrating (or ramping) processes. This subject is absolutely vital to regulatory control, but strangely is seldom taught on control courses. In fact, there are very few instrumentation and control personnel who have even heard of this subject.

From the control point of view, every process falls into one or the other of the two classes. They behave, and are tuned, very differently, and it is essential that one fully understands the difference if successful optimisation is to be achieved.

The two response types

Figure 1 illustrates the basic difference in responses between the two classes of processes. Self-regulating processes are characterised by an open loop response to a step change that rises or falls to some new and constant value after the loop dynamics have died out. Integrating processes are characterised by an open loop response to a step input change that ramps continuously at a constant rate after the loop dynamics have died out.

A typical example of a self-regulating process is the flow process shown in Figure 2. The process variable (PV) effectively follows the movements of the process demand (PD).

Integrating processes, however, which are typified by level control processes as shown in Figure 3, have a very different relationship between PD and PV.

All integrating processes rely on balancing the input and output of the process to keep the PV constant. In the case of the level control, the PV remains constant when the PD has the valve at such a position so that the flows in and out of the tank are equal. When this condition exists, the process is said to be balanced, and the PD and actual valve stem position are said to be at the balance point.

If the PD is stepped away from the balance point, the inflow and outflow will now differ, and the level will either move up or down, as the
case may be, in the form of a constant ramp. If the PD is left at the same place, the ramp will continue until the tank empties, or overflows.

This means that an integrating process is inherently unstable, because if left in manual, the balance point will change sooner or later due to load changes, and the process will tend to ‘run away’. Therefore integrating processes cannot be left unattended in manual for too long, and in fact, must really be controlled in automatic. Self-regulating processes, on the other hand, are inherently stable and can be left in manual.

In view of this, one could query why self-regulating processes need to be controlled at all. The main reason that controllers are used for the vast majority of such processes is to cope with load changes. (Load changes can be defined as a change in conditions external to the loop causing the PV to change and to move away from set-point). Of course in some cases the controller is there to make the process follow set-point changes.

Some processes are difficult to categorise
It can, in certain instances, be very difficult to decide to which class a process should belong, as some processes appear to be both integrating and self-regulating. For example, take the case of a level process similar to that illustrated in Figure 3, but without the pump at the bottom of the tank. Such a process is referred to as a ‘gravity fed’ tank. If the level in this tank was in balance and the control valve was then opened a bit, the level would then start ramping down in the typical integrating fashion. However, as it drops, the hydrostatic head above the outlet pipe would decrease, thus causing the flow to decrease as well. The ramp rate would also decrease, and eventually if the valve had not been stepped too far, the level would balance itself out again, before the tank emptied. The response on the PV would actually look, in the long term, like a self-regulating process.

So what class of process does it actually belong to?
The rule of thumb is: you tune a process the way it starts reacting. So, if a process starts out as integrating (like the gravity fed tank), and then turns into a self-regulating process, you tune it as an integrating process. If it starts out as a self-regulating process and then becomes integrating, it is tuned as a self-regulating process.

Other rules of thumb are that flows are always self-regulating, and levels integrating. One exception on levels is controlling the head over a weir, which is self-regulating. It can sometimes be quite difficult to decide into which class of process pressures and temperatures fall. One way to decide is to look at the response of the processes to changes when the loop is in manual or in automatic. Typical responses are shown in Figure 4.

The importance of understanding the subject cannot be over-stressed if you wish to successfully optimise control of processes. Most people have a basic feel of how self-regulating processes operate, and how to go about tuning them. However, in general, very few people have any understanding, and even more importantly, any feel, on how to tune integrating loops.

In most plants I go into the integrating loops are in a shocking state, being so badly tuned that they exhibit very slow cyclic responses to set-point or load changes. Many are in a continuous, very slow cycle. I was quite amused recently, when after an in-plant course in one of South Africa’s largest petrochemical refineries, the chief control engineer, a man with high qualifications and many years of experience behind him, admitted to me that the section on optimising integrating loops had been a real eye opener to his staff and to him, and that he now agreed that probably not a single one of the many hundreds of level loops in his plant had been tuned correctly.

Figure 5 illustrates a typical example of an ’as found’ level control response to a step change in set-point, and Figure 6, the response on the same loop after proper tuning for ‘tight’ control. It should be noted that not all levels are tuned this way, as in some processes the level control is detuned to prevent the control valve from moving around too much, but this is the subject for another discussion.

![Figure 5](image1.png)

**Figure 5.**

![Figure 6](image2.png)

**Figure 6.**
Advanced pump control

Factory automation continues to develop year on year and pumps are increasingly required to supply real-time operating data to control networks so that their performance can be monitored and adjusted to meet constantly changing production requirements.

Hardwiring a sensor into a pump’s rotating drive shaft usually requires the use of a delicate slip ring, but an alternative solution is to use a non-contact radio frequency detector, as Mark Ingham of Sensor Technology in the UK explains. However, such advances are not without their difficulties, one such being the need to connect machines and equipment such as pumps, mixers and conveyors to the control computers. Wiring up one machine is a great task, but a highly automated factory will have literally hundreds of them, so the task becomes considerable.

One of the most time-consuming tasks is fitting torque sensors to rotating equipment, as this requires the use of fiddly and fragile slip rings. However, torque is a key performance indicator. For instance, a gradual increase in a pump’s torque may suggest increasing flow to compensate for growing leakage; a sudden increase may indicate a blockage downstream of the pump, while a sudden reduction may be due to an upstream blockage.

So, in automated plant it is well worth measuring torque, but can fitting a suitable sensor be made quicker, easier and therefore more cost effective?

The answer to this question is yes. TorqSense is a wireless sensor that replaces the need for physical wiring and slip rings with radio wave communications. Fitting a TorqSense typically takes about one-fifth the time required for a conventional hardwired transducer.

So how do they work?

TorqSense transducers use two surface acoustic wave (SAW) devices, which are attached to the surface of the shaft. When torque is applied, the SAWs react to the applied strain and change their output. The SAW devices are interrogated wirelessly using RF, which passes the SAW data to and from the electronics inside the body of the transducer.

Applications

SAW-based torque sensors have been used around the world and in many fields, from test rigs to wind turbines and generators based on tidal or river flows. They are used extensively in the high-tech world of the development of engines and gearboxes for Formula 1 and other hyper performance cars. Torque feedback systems have also been used by security firms to determine the direction their movable CCTV cameras are facing so that they can efficiently watch premises under their protection, in industrial mixing, long-duration scientific experiments, to model aircraft thrust lift and control systems, etc.

They can be used with virtually all pump-based systems, from micro-dosing of active ingredients in pharmaceutical production, to cake filling injection in high-volume bakeries, to lubricant and coolant circulation in manufacturing machinery, to flow control in industrial washing machines and paint spray robots; they can prove invaluable when coupled with the giant pumps used for fresh water distribution, wastewater handling and flood management systems. Their potential uses with pumps are almost unlimited.

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

Accurate detection of tiny objects

The new photoelectric units from ifm electronic are designed for part monitoring of precision engineering, medical or other tiny components. Thanks to the precise laser, the photoelectric fork sensor even detects objects with a diameter of only 30 μm.

Settings and diagnostics with IO-Link

Thanks to IO-Link, adaptation of the sensor settings to suit individual processes or environmental requirements is also possible. In the power mode, high light intensity ensures that objects are reliably detected even under difficult conditions. In the speed mode, switching frequencies of up to 10 000 Hz are possible. Moreover, the sensor detects it if its own lens is soiled, so that it can be cleaned in time to guarantee process reliability. Other benefits include:

• Quick setup: no need to align transmitter and receiver.
• Soiling is signalled by permanent monitoring of the quantity of light.
• Sensor modes (power, speed, high resolution) can be set in accordance with the specific application.
• The accurate laser guarantees reliable detection of tiny objects from 30 μm.

For more information contact ifm – South Africa, +27 12 450 0400, info.za@ifm.com, www.ifm.com
Brain Gain!
HMI Panels and Block I/Os with CODESYS 3 PLC

TX700: Modern HMI/PLC compact devices with capacitive multitouch and gesture control enabled

TBEN-L-PLC: Rugged CODESYS v3 PLC for intelligent control concepts without cabinet

PG-V3: Programmable modular I/O systems with PROFINET, EtherNet/IP and Modbus TCP slave

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SMC launches wireless valve bank in SA

In response to customer demand for a reliable communication system, which could limit the number of cables needed to communicate between multiple valve banks/field sensors and a PLC, a wireless communication module was the only logical answer. SMC has developed such a system, the EX600-W, which has addressed all the necessary safety and interference concerns.

The module has been registered with ICASA for use on the 2,4 GHz frequency band. This falls well out of the range of any frequency disturbances generated in an industrial environment, thus negating all possible interference from welding machinery, motor drivers or electro-magnetic heating systems. Furthermore, the base and remote modules use a unique frequency hopping algorithm to provide stable communication and prevent disruptions from other electronic devices. The system is designed to work within a 10 m radius using an encrypted protocol to prevent unauthorised network access.

The EX600-W base unit makes use of Ethernet/IP or Profinet protocols and is capable of pairing with up to 127 remote modules. The base unit can handle up to a combined total of 1280 inputs and 1280 outputs. These can be distributed throughout the wireless network as required, giving complete control of the system layout.

Success stories
Numerous automotive industry customers have tested the EX600-W on their tool changers and spot welders. In over two years of test operation zero failures were reported.

In another application, a leading developer of solutions for automotive, aerospace and the food, beverage and pharmaceutical industries, designed a compact three-station pick and place robot cell. Due to the elimination of field-based wiring, simple block diagrams replaced complex wiring plans. The elimination of communication wiring enabled the controls engineer to significantly reduce the setup and integration times, reducing the delivery time of the cell from six months to four weeks.

In a third case, SMC UK and ATG partnered with MAKE UK to design and build a state-of-the-art training facility for engineering apprentices. The 10 m radius of the EX600-W offered the perfect range for wirelessly integrating all training stations in the cell, with one base unit connected to the PLC via Ethernet/IP. This has significantly reduced the cabling costs and installation time of the various stations. Furthermore, thanks to the built-in web function of the EX600-W, all stations can be remotely monitored away from the physical infrastructure.

For more information contact Wade Holland, SMC Corporation South Africa, +27 11 100 5866, wholland@smcza.co.za, www.smcza.co.za

BMG’s new generation of IE5+ motors

In 1916, BMG and German precision engineers, Getriebebau Nord, entered into a partnership agreement to assemble, distribute and support Nord Drivesystems throughout southern Africa.

BMG has made a substantial investment over the years to ensure assembly, stockholdings and technical support for the Nord range are in line with stringent international quality, safety and environmental standards. “Nord Drivesystems comprise optimum drive configurations to ensure high performance of mechanical speed control for specific applications, in almost every industry,” says Deon Crous, national product specialist, Nord Drivesystems, BMG. “Nord modular drives, designed for reliability, energy efficiency, low noise levels, extended service life and reduced maintenance are used in applications where frequently changing speeds are essential and where a specifically defined sequence of movement is required.

“New to BMG’s range is the recently-launched IE5+ motor range, which combines high efficiency and a compact design that delivers reduced total cost of ownership. The special design of the IE5+ motor and its operation with a frequency inverter means the same motor variant can be universally used. Another advantage is that the same motor type can be used independent of the respective mains voltage or local energy efficiency regulations.

“These energy-efficient permanent magnet synchronous motors offer a high power density, have considerably lower losses than the current IE4 series and are particularly well suited for operation in the partial-load range. Compact IE5+ motors, with lightweight aluminium housings, require less installation space. This range is initially available in a size for power ranges from 0,35 to 1,1 kW, with Nord planning to include more sizes and power ratings.”

The new corrosion-resistant Nord IE5+ motors, designed for easy cleaning and washdown, are ideal for use in hygienic applications and in harsh environments. These motors are available with nsd tupH surface treatment, an IP69K protection class and an integrated mechanical brake. An integrated encoder forms part of the standard equipment.

They can be combined with all Nord gear units and drive electronics as a modular system to enhance LogiDrive systems.

For more information contact Deon Crous, BMG, +27 21 492 7070, deonc@bmgworld.net, www.bmgworld.net

For more information contact Wade Holland, SMC Corporation South Africa, +27 11 100 5866, wholland@smcza.co.za, www.smcza.co.za
Valves for pump protection

Thyssenkrupp Steel Europe has opted for Schroeder pump protection valves during the recent overhaul of Unit 4 of its power station in Duisburg. The valves that were installed previously from another supplier repeatedly caused problems because the minimum flow control was carried out by two valves. This design often led to an increase in the drive power requirement and a drop in overall efficiency. So Thyssenkrupp Steel looked for a better solution. The required valves had to have a nominal size of 125 mm for the electric pumps and 200 mm for the turbo-pump, and a nominal pressure of PN 630 bar.

Thyssenkrupp Steel decided on the automatic minimum flow system of the SMA series manufactured by Schroeder Valves. These are high-pressure valves, which automatically protect centrifugal pumps against damage that may occur as a result of the partial evaporation of the pump content when the pumps are operated under low load. As soon as the main pump flow falls below a predetermined value, the valve opens the bypass and safely drains the minimum volume, even if the pumping volume in the main flow direction drops to zero.

The bypass is always completely opened or closed through its pilot-controlled valve piston. This on/off control makes it possible to increase the load limit of the valves up to 630 bar (pumping pressure). The preferred utilisation range is thus between PN 250 and PN 400 or ANSI CLASS 2500. The bypass amount may be up to 35% of the main pumping volume. The minimum quantity can be up to 12 percent of the full-load delivery rate.

The Schroeder SMA valve is a compact system that combines the performance formerly achieved by the two built-in valves so that a second valve is no longer necessary. Thyssenkrupp Steel chose Schroeder Valves because of the proven track record of reliability, durability and extremely low maintenance in other plants. This is due to the construction and the high-quality materials used in the valves. In the event that maintenance should be necessary, Schroeder Valves has attached particular importance to the ease of maintenance: for the replacement of wearing parts such as pistons and seat rings, it is not necessary to remove the minimum flow line or even the complete valve.

There are hundreds of Schroeder Valves installed in plants in southern Africa with repairs and reconditioning provided by the Vereeniging and Durban Valve Repair Centres.

For more information contact Valve & Automation, +27 31 579 2593, sales@valve.co.za, www.valve.co.za

Safety light grid with muting

The new generation of safety light grids from ifm electronic allows for the muting mode without an external junction box or a muting relay being required, as they are already integrated into the receiving element. The supported muting versions are available as either crossbeam or parallel muting. Both versions allow transported material to be safely passed in or out, via the protected area. A status light, integrated into the receiver, allows for indication of the operating status.

The muting arms can easily be directly installed on the light grid and are available in two versions: either as muting arms with multi-beam sensors, similar to a miniature light grid, or as a pre-mounted mounting set with single-beam sensors. No complex installation and adjustments are necessary anymore. In conclusion, a complete package for increased safety, configured for any application, quick and easy to mount.

Benefits include:
• Easy connection of the muting sensors directly to the safety light grid.
• Muting arms with pre-mounted sensors for rapid setup.
• Parallel or crossbeam muting version for detection of variable object sizes.
• Integrated status light.
• User-friendly configuration via hardware wiring.

For more information contact ifm – South Africa, +27 12 450 0400, info.za@ifm.com, www.ifm.com
Closed panel electrical inspection

When electrical distribution equipment fails, the results can be catastrophic to a company as workplace injuries and fatalities could occur. A company’s profit margin can be negatively impacted by unscheduled downtime causing lost productivity and lost revenue. Besides large fines from governing bodies, the company could face large worker’s compensation pay-outs and civil litigation.

Closed panel inspection

By implementing closed panel IR (infrared) inspection, electrical asset inspections can be performed while the asset is under full load, but in a safe and guarded condition. Frequent inspections of these assets will provide a data history allowing the maintenance team to routinely assess the health of an electrical asset and determine when that asset needs to be repaired or replaced. Utilising infrared and ultrasound technology, the maintenance team can perform these inspections safely and routinely using a single maintenance inspection window without opening any panels.

Infrared and ultrasound with one window

There is a manufacturer in the United States that designed a maintenance inspection window that allows the maintenance team to take high-quality infrared thermograms and listen to and record ultrasound waves on electrical equipment. These windows are compliant with many of the stringent global standards such as UL, CSA, CE, etc., and incorporate a patented Poly-View System polymer for infrared inspection as well as an ultrasound port or embedded sensor, all the while maintaining a safe, closed and guarded condition for the inspection team. Another main feature of this window is the ability to customise into any size or shape needed to get the inspection job done. These maintenance inspection windows are truly a ‘Safety by Design’ tool as outlined in NFPA 70E 2018.

This dual inspection technology is gaining popularity as a key critical product used in condition based maintenance programmes. Companies are continuously searching for solutions to mitigate risk, reduce operating costs and increase productivity and worker safety. Preventing equipment failures by performing proactive maintenance inspections saves time and money in the long run. A single maintenance inspection window that offers both infrared and ultrasound capability is cost effective and provides a critical tool in a condition based maintenance inspection model.

Surge protection for electro-mobility

The market for electric cars is growing exponentially and automobile manufacturers are increasingly focusing on electro-mobility.

However, surge protection also has a part to play in this technology. Charging stations and home charging stations are high-quality and highly complex systems that need to be available at all times. A surge protection concept provides the necessary protection for both the charging station and the electric car that is connected, protecting against over-voltages caused by lightning strikes and switching operations on the grid.

Feed-in is protected with Phoenix Contact’s new Valvetrab EV surge protective devices developed specifically for e-mobility applications. The new product family consists of a type 1+2 combined lightning current and surge arrester and a type 2 surge protective device. Both versions are available with optional remote indication contact. The plugs enable easy insulation measurement and are mechanically coded. This prevents accidental mismatching of the plugs.

Type 3 surge protective devices. These devices are already available in the Phoenix Contact product portfolio and work with the new VAL-EV devices.

For more information contact Phoenix Contact, +27 11 801 8200, sbritz@phoenixcontact.co.za, www.phoenixcontact.co.za

For more information contact R&C Instrumentation, +27 11 608 1551, info@randci.co.za, www.randci.co.za
Ethernet for Ex areas

Turck is opening the world of the process industry to digitalisation and Industry 4.0 with its first Zone 2 Ethernet gateway for the excom I/O system. All process data can thus now reach IT systems for analysis and evaluation at sufficient speed via a parallel data channel – a fast and easy way of implementing condition monitoring and predictive maintenance. Controllers and control systems are protected from access attempts. The new GEN-3G multiprotocol device operates at high data rates in Profinet, Ethernet/IP or Modbus TCP networks without the need for manual intervention.

The integrated gateway switch enables the implementation of linear topologies, which can be connected easily in the network to form a ring. Besides the hardware redundancies for power supply units and gateways, excom also supports redundancy concepts such as S2 system redundancy to ensure maximum availability. excom can also provide special solutions for protocols that do not specify any native standards for redundancy. The I/O system thus offers a standard redundancy landscape for operators, irrespective of the protocol used at the particular site or plant section.

Regardless of whether excom is used for Zone 1, 2 or the safe area, users can always rely on the same DTM, EDS or GSDML and the same operator logic. This reduces the training required and ensures flexible use by specialist personnel in different plant sections. Turck’s cloud components and edge devices, such as the TX700, are ideal solutions for calling up and routing the parallel process data. The tailored graphical user interfaces for industrial applications simplifies the selection of the relevant information. The analysis systems can be hosted in the Turck cloud, by other cloud suppliers, or in the local network. Turck’s encrypted Kolibri cloud protocol as well as MQTT and OPC UA are available.

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

Keep distance easily

SICK Automation has reacted to slow the spread of the Covid-19 virus with its new PeopleCounter and DistanceGuard SensorApps. Combined with 2D and 3D LiDAR sensors, people can easily maintain the recommended minimum distance in public and predefined spaces. Since the sensor solution does not process personal information, companies can ensure that not only hygiene restrictions, but also data privacy standards and regulations, are observed. Operators of institutions of public life as well as those that deal in tourism, gastronomy, retail and various other industries can profit from a simple solution for easily keeping the maximum utilisation of space and the minimum distance between people in view.

PeopleCounter

The PeopleCounter (PeCo) is a SensorApp developed by SICK which enables anonymous data processing and differentiation of people from objects over large detection areas. Based on the hardware of the MRS1000 3D LiDAR sensor, measurement data is generated as a point cloud. The integrated PeopleCounter app reliably identifies people using their contours. This means only people are counted, while objects are blanked out. This process runs anonymously and without recording personal information.

Thanks to the four layers of the sensor, the direction of movement of a person is clearly established and the current utilisation of a defined zone can be monitored. The recorded data is output via telegrams and digital outputs to keep track of the maximum number of people. The combination of several sensors makes it possible to cover even large areas with different entry and exit points, such as shopping centres, airports or trade fairs.

DistanceGuard

The DistanceGuard SensorApp, in combination with the TiMxxx 2D LiDAR sensor, can detect the distance between two people. This is especially useful in environments in which the currently recommended minimum distances between people must be upheld, for example when waiting in line at a store. As soon as the distance between two people falls short of the configured minimum distance, a signal is generated. Depending on the customer’s wishes, this could be a light, a tone or a visual signal.

For more information contact Grant Joyce, SICK Automation Southern Africa, +27 10 060 0550, grant.joyce@sickautomation.co.za, www.sickautomation.co.za
Stafsjö MV standard knife gate valve

Do you want to try the MV performance?

The MV is an all-round valve with a proven global track record both on dry solids and wet fluids. The valve’s ideal internal clearances lower friction and make it easy for the bevel edge gate to cut through and seal tight on media such as pulp stock up to 7%, black liquor, white liquor, sludge, biomass, granules and water.

When the gate reaches its final stage of closure it stops on the cast and precision machined body cams to avoid jamming on difficult media.

For more information contact Valve & Automation, +27 31 579 2593, sales@valve.co.za, www.valve.co.za

Multicolour indicator with IO-Link

The K50 Pro series multicolour indicator combines existing IO-Link features with Pick-IQ technology. It allows users to configure colour, flashing, dimming, and advanced animations like rotation, strobing, two-colour display, two-colour rotation, two-colour flashing, and chase.

The K50 Pro series capacitive touch button combines existing IO-Link features with Pick-IQ technology. It can be actuated with bare hands or gloves and has adjustable sensitivity levels. Additionally, it has excellent immunity to false triggering by water spray, oils and other foreign materials.

The optical model has an illuminated dome to make it easy to see job light status. Users can customise or select standard function configurations. The push-button gives users tactile confirmation that the button has been pushed, compared to relying exclusively on the visual confirmation from the indicator.

New features

IO-Link is a point-to-point communication link between a master and a light. There are many advantages of an IO-Link system, including standardised and reduced wiring, increased data availability, remote configuration and monitoring, simple device replacement, and advanced diagnostics. Together, these capabilities result in overall reduced costs, increased process efficiency, and improved machine availability.

Pick-IQ brings faster response speed and simplified programming to Modbus RTU communication. It gives full access to colour, flashing, rotating, and dimming settings as well as advanced animations such as dynamic sequence mode and LED control. Output settings, including on and off delays, output function, and output state are also available.

Using Pick-IQ adds a simple change to the devices that allow the Modbus master controller to run standard Modbus protocol, but achieve the performance required by a medium to large sized pick-to-light system.

Applications include:

• Pick-to-light and manual assembly.
• Error proofing.
• Call button.
• Dynamic operator interface.
• Wet and high-pressure wash-down environments.

For more information contact Brandon Topham, Turck Banner, +27 11 453 2468, sales@turckbanner.co.za, www.turckbanner.co.za
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Netilion, IIoT Ecosystem
From sensors to digital services

Key facts

- Netilion, Endress+Hauser’s IIoT Ecosystem allows intelligent and networked applications to be realized around the Industrial Internet of Things

- We currently have four Netilion Services available with Analytics, Health, Library and Value as well as two Netilion Smart Systems with Surface Water and Aquaculture

- Data security is ensured by using the most modern standards and through audition by independent third-party certification bodies

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