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Digital transformation is gaining momentum as it enables new opportunities for value creation, innovative business models and trendsetting forms of cooperation. Siemens recently hosted a Digital Enterprise Series week to demonstrate insights into digital transformation and launch the Dawn of Digitalisation and its Impact on Africa. See this month’s cover story on page 20 for more.

Siemens launches report on Dawn of Digitalisation and its Impact on Africa

Endress+Hauser, WIKA Instruments, Morton Controls, Beckhoff Automation, Omniflex Remote Monitoring Specialists

Macsteel Fluid Control, SEW-Eurodrive, Sensoquad, Gail Norton Instrumentation


Absolute Perspectives, Throughput Technologies, Axiz

QTEK Instrumentation & Calibration Solutions, RS Components SA, Zest WEG Group, Comtest

Phoenix Contact, ASSTech Process Electronics & Instrumentation, Rockwell Automation, SICK Automation Southern Africa, Tectra Automation, Turck Banner, Emerson Automation Solutions, Johnson Controls, Zest WEG Group

SKF South Africa, Emerson Automation Solutions, R&C Instrumentation, Instrotech, ElectroMechanica

KVMTech, Powermite, Pepperl+Fuchs

Schneider Electric SA, Comtest, Trafo Power Solutions
IT-OT integration becoming a must, but there are challenges

We're seeing the insecurity around digital transformation start to fade as the history of case studies builds to show how enlightened manufacturing companies have applied the ideas to rationalise their operations. The IIoT is moving beyond hype and becoming a reality thanks to advances in sensor, networking and analytics technologies. However, as connectedness permeates down to the shop floor, the spread of Ethernet-enabled devices has started to give this traditional OT domain a distinctly IT look and feel.

Traditionally, IT has been responsible for the creation, transmission, storage and security of the organisation's data, mostly at the levels of administrative and customer relations activities. OT, on the other hand, centres on control of the manufacturing processes, with a direct and measurable impact on production efficiency and quality control. Thanks to the rise of the industrial Internet, these two conventionally separate domains are getting squeezed ever closer together. The introduction of smart metering devices, augmented reality, self-monitoring assets and cloud-based analytical packages has forced a gradual extension of the office IT network down to the production level, and even out into the field.

This does not come without risk, perhaps the most obvious being to network and device security. Some level of risk is vindicated of course, provided the rewards justify it and the situation can be responsibly managed. The question then becomes: Who should be held accountable for this? The answer is the CIO, but it's more complicated than that.

Making the CIO accountable in an IT-OT converged structure means that barriers between the engineering and IT departments must somehow be broken down and the two entities joined at the hip. Easier said than done when one considers that it involves much more than just rerouting a line on an organogram.

If the challenge were simply about technology integration then convergence would be easy. But it's not. It's about two different worlds colliding. Two departments which worked using completely different systems, technologies and vendors in the past, must now come together in such a way that the new generation of operational technologies exists alongside the organisation's current information and administration-focused IT systems.

To be successful requires new ways of thinking about traditional business structures, and in particular, the role of the CIO. In the converged business model, the responsibility of the CIO grows from purely leading IT delivery within the organisation, to taking responsibility for all process and information related assets, whether or not these were supported and managed by IT in the past.

To reap full benefit from Industry 4.0's new digital technologies, IT and OT must live side by side in the future, which means an extension to the CIO's traditional areas of responsibility. As the call for digital transformation grows louder, the organisation's top management will be required to adopt new ways of thinking and expand their traditional skill sets. Contributing editor Gavin Halse examines these challenges in more detail on page 40.

Steven Meyer
Editor: SA Instrumentation & Control
steven@technews.co.za
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Rockwell Automation announced as Founding Member of ISA Global Cybersecurity Alliance

Production facilities can contain thousands of technologies from different vendors. Cybersecurity threats only need to exploit one of them to steal trade secrets, stop production or even harm workers. To better secure today’s complex and often vulnerable production operations, the ISA Global Cybersecurity Alliance recently announced Rockwell Automation as a founding member.

The alliance is a coalition of industry, government agencies and others working to help secure industrial operations. Some of its objectives include:
- Accelerating the expansion and use of the ISA/IEC 62443 standards.
- Developing a skilled and cyber-aware workforce.
- Optimising compliance and prevention initiatives.

“Cybersecurity is critical to digital transformation,” explains Rockwell Automation CEO, Blake Moret. “It is critical not only for the protection of information and intellectual property but also for the protection of physical assets, the environment and worker safety. Our engagement with the Global Cybersecurity Alliance will be another important step in our efforts to help customers identify and mitigate risks.”

Emerson helps complete first Caspian subsea project

Emerson has completed its $48 million contract for automation systems and cloud engineering software-as-a-service for the Shah Deniz 2 project in Azerbaijan and is fulfilling an ongoing five-year services contract to help ensure reliable, safe operations. Emerson’s support services, predictive reliability software and digital twin solutions will help optimise operations and achieve reliable performance.

The $28 billion project includes the first subsea development in the Caspian Sea. At plateau, the BP-operated Shah Deniz 2 is expected to produce 16 billion cubic metres of gas per year. Emerson served as the main automation contractor (MAC) for the megaproject, with the company’s Project Certainty approach supporting a reduction of global automation engineering complexity, which contributed to production starting more than four months ahead of schedule.

Ham-Let smart valve nominated for IoT award

In another remarkable achievement for the Ham-Let Group, its state of the art IoTH800 was nominated for best product award at the First Industry Of Things World Award 2019. The Ham-Let Internet-of-Things IoTH800 Smart valve, a unique breakthrough in the process valves industry, features constant monitoring, management and control of position/state indication, pressure, flow, humidity and temperature. The device embodies innovation in its compatibility with a wide range of industry 4.0 applications. Moreover it enables the industry online monitoring, control and management of various processes which consequently allows immediate response for safety events, machine learning and optimisation, machinery and equipment protection, device tracking and more. Ham-Let is locally represented by Fluid Systems Africa.
On 29 October 1969 with the development of the inductive proximity switches for 220 V supply voltage for direct triggering of a contactor, ifm electronic geräte gmbh+co kg was born. At first, ifm's product portfolio consisted of inductive sensors with a sensing range of 10 and 20 mm. The motivation was to do it in a different way than all the others – and better: with quality, reliability and customer service.

Today, half a century later, ifm's exceptionally wide product portfolio does not only cover all relevant standard solutions but also the special requirements of individual industries. In addition to position and process sensors, sensors for motion control and safety technology are part of the product range.

Furthermore ifm offers products for industrial imaging and communication as well as identification systems and systems for mobile machines. Besides, ifm has been developing more and more innovative Industry 4.0 solutions.
BMG emphasises Hallite hydraulic and pneumatic seals

BMG supplies an extensive range of hydraulic and pneumatic seals and sealing solutions for demanding environments, and is also the distributor for Hallite Seals International within central and southern Africa.

“Hallite sealing systems are manufactured from robust materials which include nitrile rubbers, rubber and fabric compounds and thermoplastic elastomers – all proven to keep a system free from external contamination,” says Marc Gravett, business unit manager of BMG’s Seals and Gaskets division. “Hallite’s design engineers and material technologists give careful attention to seal profile design and material selection. Product properties are methodically studied to ensure that the finished component has the required qualities to cope efficiently in harsh operating conditions.”

Included in this range of hydraulic and pneumatic seals are rod and gland seals, piston and static seals, as well as support and bearing components, which are constantly upgraded to keep abreast with changing market demand.

Compliance with local and international standards

BMG’s extensive range of quality branded sealing products – which includes rotary shaft, torric, hydraulic and pneumatic seals, as well as allied products like O-rings, waved washers, circlips, mechanical seals, gland packing and adhesives – complies with stringent local and international quality specifications.

The company’s commitment to providing high quality seals is evident in the extreme care taken in brand selection, in terms of standardisation, reliability, flexibility and consistent quality controls. These sealing products meet the demands of the OEM and end user for efficient performance from equipment that needs to work harder and for longer periods, as productivity levels increase.

BMG, which has been the exclusive distributor in southern Africa for Hallite Seals for over 35 years, provides a technical advisory and support service in all sectors.

For more information contact Lauren Holloway, BMG, +27 11 620 7597, laurenhy@bmgworld.net, www.bmgworld.net

KZN Expo brings industrial technology solutions under one roof for diverse exhibitor base

Once again proving that it’s the definitive platform for its 145+ exhibitors to showcase their industrial technology solutions, the KwaZulu-Natal Industrial Technology Exhibition (KITE) attracted a captive audience of over 4200 industry decision makers.

Nick Sarnadas, portfolio director at Specialised Exhibitions Montgomery, explains that the exhibition’s success stems from its multi-layered approach to promoting its diverse exhibitor base: “Obviously, the exhibition stands take centre stage. The interactive stands provide the visitors with an opportunity to experience the best-of-breed industrial technology solutions in the KZN region, all under one roof. Not only does this eliminate the hassle of having to source every single solution from a variety of suppliers who may be scattered all over the province, but it also places visitors in a position where they have access to live demonstrations on a wide variety of products and services.”

In addition to the exhibition, various educational and training opportunities were available to the visitors. For the first time, the exhibition hosted the Artisan Training Zone. Organised by the Artisan Training Institute (ATI), this dedicated area allowed visitors to see artisans demonstrate the trade skills they had learned at the Institute. According to representatives, the interest exhibited by the visitors was very encouraging.

Sarnadas says that the feedback received from both the exhibitors and visitors underlined the success of the event in bringing suppliers and consumers of industrial technology together in a highly positive and productive manner.

“What a fantastic turnout,” said Ernie Koopmans of Integration-Services. “It was my first time exhibiting at KITE and it has exceeded all my expectations. I’m over the moon.”

Long-term exhibitors, Beckhoff Automation, were equally pleased with the number of high-quality sales leads they received. “KITE fulfills three major goals for us: connect with new customers; discuss new technology with existing customers; and reinforce our brand in the industry,” said the company’s Kenneth McPherson.

“We are thrilled at the response from both the exhibitors and visitors to KITE and we are grateful to the support received from our sponsors, the various representative industry bodies and our partners. We are now in the planning stages for KITE 2021, which will mark 40 years since the show was launched,” says McPherson.

For more information contact Keraysha Pillay, Specialised Exhibitions Montgomery, +27 10 003 3175, info@kznindustrial.co.za, www.kznindustrial.co.za
The Bearings International (BI) Durban branch stocks a wide range of bearings, electric motors, gearboxes, lubricants, seals, tools, and power transmission products for a range of industries. These include food and beverage, cement and quarries, pulp and paper, port and rail, water and sanitation, sugar mills, mining, petrochemicals, and animal-feed plants.

The main brands showcased are FAG bearings, FIS products, INA, Bauer electric motors and gearboxes, Rocol Lubricants, Cooper split bearings, Senqcia (Hitachi) chain, Ewart Chain, KOYO, Link belt, Dodge, Rexnord, Makita power tools, and Jonnesway professional tools.

The branch is managed by Trevor Veeradu, whose engineering expertise has stood him in good stead with regard to industrial gearboxes and conveying systems, specialising in light and heavy duty rubber belting, and thereafter hydraulics and pneumatics.

BI Durban offers support to the entire province, as well as supplying customised solutions for largescale technical projects. The branch has an in-house division that refurbishes sugar mill carrier and diffuser chains, as well as assembling and supplying new chain. It also manufactures specialised sprockets as per customer requirements.

Trevor Veeradu.

KZN a key growth area for Bearings International

Cummins stirs interest in pump-engine product line

Cummins recently hosted a highly successful seminar in both Dubai and at its Power Hub in Waterfall City, Johannesburg, to introduce end users and OEMs to its range of high-quality engines for the pumps segment. Here applications include agriculture and irrigation, dewatering and firefighting.

Cummins’ engines are ideal for the pump segment, focusing mainly on mechanical engines from 50 to 2700 hp. Sales and earthmoving segment leader, Bo Fu explained: “Our scope of supply also extends to ancillary equipment such as radiators, variable or fixed speed drives, different pump certifications and diverse engine ratings.

“Our ultimate goal was to showcase to customers the full range of products we can support. In this instance, we focused on the packaged engine, which is a complete power solution with a mechanical or electronic engine sourced from plants in India and China to be able to offer customers competitive pricing and lead times.”

“At both events our aim was to emphasise the total support we can offer our end users,” stressed pump engines segment leader, Mohamed Othman. “While our engines took centre stage, our value proposition extends to the possibility of our customers becoming reference points and business partners in their respective areas. Cummins’ extensive footprint in the AME region, including regional distribution centres in South Africa and Ghana, means we are able to offer full aftermarket support anywhere in the region.”

While many competitors are offering more advanced electronic engines for the pump segment, Othman pointed out that Cummins has decided to provide mechanical engines due to their robustness, user-friendliness, ease of maintenance and improved uptime. In addition, the mechanical control panel gives operators leverage in operating the engines much more efficiently. “The main advantage of mechanical engines is that they do not incur any downtime as a result. In addition, operators are trained either by us or the pump OEMs themselves,” he added.

Such was the success of the seminars that the Dubai event, in particular, attracted enquiries from existing OEM customers, some of whom were interested in volume orders. The packaged engines on display ranged from 120 to 360 hp as an illustration of the diversity of Cummins’ product range.

“Our strategy to break into the pump segment is not to introduce innovation in the sense of new product developments, but to reassure our customers that we can supply fit-for-market solutions that make a lot more sense in terms of the harsh operating conditions in Africa,” concluded Othman.

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

Additional services encompass bearing inspections and fitments, condition monitoring, customer training, gearbox repairs, technical advice for all projects, from small to large, as well as bearing reconditioning, vibration analysis, specialist manufacture, on-site operations, troubleshooting, 24/7 service, and even design and selection.

Staff are kept up to date through ongoing training, which is also offered to customers upon request. “Our strength lies in our people and knowledge, and our commitment to servicing the customers who have supported us over the last 65 years,” concludes Veeradu.

“We have great plans to extend our product offering even further in the future and, as part of the Hudaco Group, our value proposition to customers is commensurately larger.”

For more information contact Bearings International, +27 11 899 0000, info@bearings.co.za, www.bearings.co.za
Trafo supplies transformers for data centre application

Trafo Power Solutions recently supplied two 2000 kVA 11.6 kV/415 V dry-type transformers to a large data centre in Cape Town. Manufactured under stringent quality control conditions at Italian transformer OEM TMC, these specialised units are low loss transformers which conform to the European Directive EU 548-2014 and will provide greater energy savings in this application.

David Claassen, managing director of Trafo Power Solutions, explains that it is important to understand data centre applications, and especially the load which the transformer will be supplying, as well as the type of switchgear that will be feeding it, as this is important from a voltage transient perspective.

"Data centres are energy hungry beasts that operate with a high power demand, and it is important that the most appropriate transformers with the requisite protection devices are specified for this robust application," explains Claassen.

"Dry-type transformers are ideal for such situations, and correct upfront design played a role in ensuring that these transformers will meet the application requirements."

The design was important in terms of the transformer's windings and core to cope with the high percentage of non-linear or harmonic load. These transformers were designed differently to a standard distribution load transformer and have an electrostatic shield which diverts noise to ground as well.

Trafo Power Solutions was able to assess the application requirement and provide a solution that could be delivered within a tight delivery time frame, which was an added advantage to the end-user.

For more information contact David Claassen, Trafo Power Solutions, +27 11 325 4007, david@trafo.co.za, www.trafo.co.za

BMG and AAC partner in Jeppestown clean up

The joy of teamwork is clearly evident in the partnership between engineering specialists, BMG and entrepreneurs, Agri Arts & Construction (AAC). "Through this match made in Jeppestown, home to both companies, the area looks much neater," says Ruth Black, Group HR executive, Engineering Solutions Group – the holding company of BMG. "The gardens and pavements around BMG’s head office and warehouse facility, BMG World, are now regularly cleaned and manicured by the eight-man AAC gardening team, all of whom were previously unemployed. With BMG’s assistance, AAC now has a corporate identity design, working uniforms and tools selected from the Tools & Equipment division."

"The BMG team is not only proud to work with AAC, but we also enjoy a close association with Jeppestown's urban developers, who are committed to improving the quality of life for this community. The Bjala Foundation is currently developing affordable housing and a healthy urban environment in the city. In fact, many BMG staff members now reside in revamped apartments in the area. Bjala’s programme also involves the provision of education in the area, skills development and job creation, as well as improved safety and a clean environment."

A key motivator of these initiatives, Malibongwe Sithole, director of AAC and Bjala’s Community Liaison Officer had this to say: “Our partnership with BMG has changed our lives for the better. The company has offered more than we expected and this is an honour for the team. We feel important and we are proud to play an active role in keeping our environment clean. We have recognition and a sense of belonging to a community. BMG makes us feel part of a family.”

Apart from AAC’s agricultural services, including gardening, weeds removal and cleaning, the company’s construction services encompass minor renovations like flooring, plastering, painting and cleaning. BMG is committed to sustainable development and instils in its team a responsibility for health, safety, the environment and local communities.

For more information contact Lauren Holloway, BMG, +27 11 620 7597, laurenhy@bmgworld.net, www.bmgworld.net
Hytec custom designs power pack for Lephalale mine

Hytec South Africa recently custom designed and manufactured a 6000 ton power pack for a mine in Lephalale. Supplied in a three metre shipping container, the solution is equipped with a pressurisation unit, control electronics and automated lighting. The power pack was designed, manufactured and commissioned at the Rexroth HUBB in Kempton Park.

The containerised system controls the belt feeder on a coal conveyor to determine the amount of coal feeding into the line using proportional control. Independent knife gate control systems control the chute closing with a 350 kN force. Its pressurisation unit supplies clean filtered air at a positive pressure to the inside of the unit, ensuring dust is kept out, and all filters have a 100% back-up system to prevent downtime.

In using a shipping container, we are able to offer the customer a mobile hydraulic room,” says Hytec South Africa project manager, Neil Griezel. “The 6 000 ton power pack has an automated lighting system, which is activated when the door is opened, and the inside of the container acts as a secondary containment system in the event of hydraulic liquids being expelled from the system.”

The power pack was released following a rigorous factory acceptance test, which was witnessed by the customer. The unit is currently being installed by Hytec South Africa’s professional installation team. On site at the Lephalale mine, the plug-and-play unit will be connected to all the hydraulic actuators, switched on and be ready for use.

“We were given specific mechanical parameters to ensure proper integration with the customer’s final design,” concludes regional systems sales engineer, Werner Voigt. “This specialised solution is one more example of how Hytec South Africa has the capability to manufacture whatever a client requires.”

For more information contact Neil Griezel, Hytec South Africa, +27 82 887 9813, neil.griezel@boschrexroth.co.za, www.hytecgroup.co.za

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Part of your business
Peter Mauff took on the position of general manager back in 2005, and sadly, after 14 years of loyal service, Phoenix Contact has bade him farewell.

The company grew exceptionally well under his leadership and the team developed into a professional outfit offering top quality services and solutions.

Mauff was instrumental in the upgrading of the Randburg premises, which are now world class boasting a 62 seat auditorium. He also oversaw the upgrade to the Cape Town and Durban offices, which are now also in line with the headquarters in Randburg. Phoenix Contact wishes Peter all the best in the next chapter of his life; may he enjoy many happy years of travel, adventure, golf and of course relaxation. He was always a complete gentleman and will be sorely missed by everyone in the industry.

Phoenix Contact bids farewell to GM Peter Mauff

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

Rittal South Africa recently supplied innovative roof-mounted cooling units to Technovera. In an unprecedented application success story, these units were mounted on medication dispensing units as part of a unique project to improve service delivery in the healthcare industry.

Known as Pelebox Smart Lockers, these dispensers allow patients to collect their medication at any time without having to stand in long queues at clinics or hospitals. The project is currently being rolled-out across Gauteng – more about Pelebox at www.pelebox.com.

Rittal involved in a unique local project

For more information contact Rittal South Africa, +27 11 609 8294, info@rittal.co.za, www.rittal.co.za

Obermeyer highlights that the main benefit of the Generation X.e is that it introduces a customer-orientated focus into the tried-and-tested X series solution. This has been achieved by enhancing the hardware, together with an entirely new computation suite, embracing simulation, which means that a standard product can now be matched to specific modifications and settings for different client requirements and operating conditions.

This ‘smart’ combination of separate measures and networked software tools now allows users to configure their own customised gear units, which means that industrial drives now have the full potential for specific optimisation. A key factor considering the constraints, rising costs and tight margins faced by many industrial sectors globally.

The Generation X.e is suited to a temperature range from -40 to 50°C, and is available with a torque rating from 65 to 500 kN. The industrial gear units will be assembled in Nelspruit for the entire African market, which guarantees a fast turnaround time and readily-accessible parts support and service back-up.

"It is no longer sufficient merely to sell products to customers," concludes Obermeyer. "We must look at their holistic requirements and how best we can provide a complete solution that optimises all of their processes, as well as allowing for the introduction of our ancillary technologies and value-added services."

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

SEW-Eurodrive launches Generation X.e

Raymond Obermeyer.

Generation X.e represents the latest iteration of the highly-successful X series of industrial gear units, which has gained significant traction globally in industries as diverse as mining, cement and sugar mills and power generation. "It was decided to introduce the latest series to South Africa in response to the overarching industry need for energy-efficiency and optimisation," explains SEW-Eurodrive managing director, Raymond Obermeyer.

The specific client requirements addressed by the new series are maximum drive utilisation, peak load, temperature and environmental factors, and extended service intervals. The units are particularly suited to harsh operating environments such as mining and general industry. Here an increased thermal saving of 32% has been achieved mainly by reducing the periods between oil changes. Other advances include an improved bevel pinion housing, optimised bearing preload, a non-contact sealing system, a universal cover with a fan system, and optimised gearing topology.

For more information contact Sheree Britz, Phoenix Contact, +27 11 801 8200, sbritz@phoenixcontact.co.za, www.phoenixcontact.co.za
Innovating Africa’s Industries – tomorrow’s technology 4 today’s expert

On 29 August at Emperors Palace Convention Centre, Johannesburg, Endress+Hauser South Africa launched Innovating Africa’s Industries (IAI), an exciting new conference established in cooperation with other key industry players to collaborate on a journey to address the challenges faced by the process automation industry when adopting innovation and new technology. The event received keen support from industry and attracted various companies – Rockwell Automation, DRA Global, Andritz Delkor, WEC Projects, Krones, PSA Global and GEA – as sponsors.

In an effort to use tomorrow’s technology to prepare today’s experts, IAI was the first conference of its kind, to be hosted in Johannesburg, attracting a large audience including:

• Plant managers interested in increasing plant output and ensuring safety
• Maintenance managers interested in decreasing downtime and associated costs
• Engineering managers interested in plant optimisation and continuous improvement
• Operations managers interested in increasing efficiency and plant uptime
• Leaders of innovation interested in using technology to gain competitive advantage
• Automation managers interested in seamless integration to reduce transactional costs

This conference addressed many challenges identified by industry, amongst others:

• Rapidly changing trends
• IIoT and digitalisation
• Lack of skills and knowledge
• Increasing production output under demanding conditions
• Access to real-time plant information
• Ensuring safety and environmental compliance

Organised in three concurrent industry segments – Food & Beverage, Water & Wastewater, and Primaries & Metals. Each session had a stimulating agenda with different speakers sharing their expertise on various topics related to the industry. Some of the highlights were, smart mining with big data, digital transformation and the evolution of digital automation in the mining industry, digitalisation and smart cloud solutions in food & beverage applications, the journey to digital water, biological wastewater treatment technology, and preservation of water quality. Interactive exhibition stands were also available for delegates to visit during break intervals to see live demonstrations of these powerful solutions and technologies. Representing the Mining expo were DRA Global and Andritz Delkor, the Food & Beverage expo featured Krones, GEA and PSA Global, and WEC Projects represented Water & Wastewater while Endress+Hauser and Rockwell Automation represented all three industries.

Delegates also witnessed case studies of how innovative solutions empower the process industries. For example, Francois Theron from Clover shared a presentation on engineering management challenges, while Saziso Ngida from ABInBev unpacked end-user expectations for seamless integration.

The day ended on a high with a networking event where delegates unwound at the cocktail evening while enjoying some live music performances.

This is what the delegates had to say about IAI:

“The event highlighted brilliantly what is happening in the industry at the moment,” Andrew Anderson, DRA Global.

“The event was fantastic,” Andries Masekwa, Heineken SA.

Special thanks go to:
• All valued customers for giving this prestigious event their attention.
• Participating sponsors for their support and contribution to the success of the event.
• The speakers who shared their valuable knowledge and insight.

For more information contact Natlee Chetty, Endress+Hauser, +27 11 262 8000, events.za.sc@endress.com, www.endress.com
Emerson’s Flow Lifecycle Service Centre earns certification

Emerson’s Flow Lifecycle Service Centre, based in Dubai and serving customers in the Middle East and Africa region, has received accreditation for ISO/IEC 17025:2017 from the International Accreditation Service (IAS). This certifies the facility’s calibration procedures and traceability for all suitably-sized liquid flow meters of both Emerson and other flow meter manufacturers.

The Lifecycle Service Centre provides complete calibration coverage for mass flow, density and volume calibrations. These industry-approved calibrations are designed to have minimum uncertainties in mass and volume. To become ISO/IEC 17205:2017 compliant, the Lifecycle Service Centre was audited based on its competency to perform calibrations, quality management system, traceability, and measurement uncertainty.

One of the leading accreditation bodies in the United States, the IAS is a signatory to the four primary international organisations forming a unified system for evaluating and recognising competent accreditation bodies worldwide. The ISO/IEC 17205:2017 is considered as the highest specification for calibration activities in accordance with international standards.

“We are delighted that our Dubai flow calibration facility has achieved ISO 17025 accreditation,” said John Currie, Emerson’s vice president for flow lifecycle service in the Middle East and Africa. “This allows us to bring increased measurement confidence to our existing loyal customers and also enables us to serve the broader meter calibration market where this accreditation is a mandatory requirement.”

This ISO/IEC 17025 certification complements Emerson’s global network of facilities that are internationally certified by ISO standards for quality, occupational health and safety, and environmental management systems.

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

Rope access used for maintenance at 30 m high chemical reactor

When a major petrochemical producer in Mpumalanga recently had to carry out routine maintenance on a 30 m high chemical reactor, it opted for rope access for speedy ingress, as opposed to the traditional method of erecting an external scaffolding structure to allow access to the top of the building.

Due to the fact that the components of the chemical reactor are large and bulky, cranes are required to remove anything that needs to be replaced during repair work. “Our specialty is that, at short notice, we can go to site with a small rope-access team to open up sections of the roof,” commented Skyriders marketing manager, Mike Zinn. “This allows for a mobile crane to be rigged and ready in order to be able to lift any components that need repairs or replacement up through the roof.”

Not only is health and safety improved for the client, but Skyriders’ rapid response allows for major time and cost savings as well. Such has been its success at this petrochemical producer that Skyriders has been undertaking maintenance and repair work there for the past three years. “This is a clear reflection not only of our expertise and experience, but the major value that our turnkey solutions pose for large industrial clients,” stressed Zinn.

Skyriders is able to offer such customers peace of mind that it has the proper safety measures and risk assessments in place to ensure that these projects run like clockwork. “A speedy and effective response is essential, as any downtime incurred can have a major impact not only on the entire plant, but ultimately on the client’s bottom line as well,” concluded Zinn.

For more information contact Mike Zinn, Skyriders, +27 11 312 1418, mike@ropeaccess.co.za, www.ropeaccess.co.za

Practical Process Control Training Courses and Loop Optimisation Services

Michael Brown’s

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

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

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

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

His work has proved invaluable to plants and has resulted in greatly improved performance and ROI.
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Cape Town 5-7 Nov 2019
Durban 12-14 Nov 2019
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Port Elizabeth 26-28 Nov 2019

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+27 11 795 2898, training@beckhoff.co.za,
http://www.beckhoff.co.za/za/support/training

Endress + Hauser

• Instrument Technicians and Engineers

TC1001 – Process Measurement and Instrument Configuration 1
Sandton 11-15 Nov 2019

TC1002 – Process Measurement and Instrument Configuration 2
Sandton 18-21 Nov 2019

TC1003 – Process Measurement and Instrument Configuration 1 and 2
Sandton 11-21 Nov 2019

For more information contact Nico Marneweck,
Endress+Hauser, +27 11 262 8087,
nico.marneweck@za.endress.com,
www.za.endress.com

FESTO

• Mechatronic Engineers
• Maintenance and Repair Staff

PN101 – Basic Pneumatics
Durban 20-22 Nov 2019

HY152 – Mobile Hydraulics
Johannesburg 26-29 Nov 2019

HY511 – Basic Hydraulics
Cape Town 27-29 Nov 2019

For more information contact Sammy Kanye,
Festo, +27 11 971 5586,
DidacticTaC.za@festo.com,
https://www.festo-didactic.com/za-en/
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MECOSA (PTY LTD)

• Radiation Protection Officers

Radiation Protection Officers – Training Course on the use of Radioactive Isotopes in Industry
Johannesburg 12-13 Nov 2019

For more information contact
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michelle@mecosa.co.za,
www.mecosa.co.za

PHOENIX CONTACT

• Automation Engineers

SCPS1 – Signal Conditioning & Power Solutions Seminar
Johannesburg 14 Nov 2019

For more information contact
Sheree Britz, Phoenix Contact,
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sbritz@phoenixcontact.co.za,
https://www.phoenixcontact.com/online/
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VEGA

• Automation Engineers

Measurement Solutions – Processing with Level, Pressure and Nucleonic
Roodepoort 15-17 Oct 2019

For more information contact
Claudia Olver, VEGA Controls SA,
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claudia.olver@vega.com,
http://www.vega.com/

SMC

• Mechatronic Engineers

TC-PNEU-B – Basic Pneumatics
Durban 6-8 Nov 2019
Cape Town 20-22 Nov 2019

TC-MECH – Mechatronics
Johannesburg 26-29 Nov 2019

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+27 11 795 2898, training@beckhoff.co.za,
http://www.beckhoff.co.za/za/support/training

IFS – Instrumentation Finishing School
Johannesburg 2-13 Dec 2019

For more information contact Eric Carter,
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www.instrumentation.co.za October 2019 13
It is spring again in South Africa and what a gorgeous time of year. Within the SAIMC, there is also continuous improvement, working towards our 2023 strategic goals.

SAIMC structure changes
As the organisation is growing we need to ensure that we look after the best interests of all our members, ensuring that all of the progress made to date is used as a building block for continuous improvement. Our vision remains to be the guiding voice within industry to ensure progress by control.

The following advisory councils have been established within the SAIMC this year.

• End user advisory council – focusing on the end users from all industries.
• Supplier advisory council – focusing on suppliers.
• Educational advisory council: driving the need for educational change in South Africa.

To be considered for any of these councils you have to be a member of the SAIMC. You are then welcome to apply to become part of a specific council and based on the requirements, you could be eligible to join.

The aim is to ensure that each council focuses on the needs of the members it was created to serve and in return also create a voice within industry to serve the members. This provides members with different interests the opportunity to join a peer group to facilitate discussion and ensure you have a voice to address governance, legal requirements, specifications and training, and to address the requirement that the group needs to collaborate and generate action.

I urge each of you to get involved in these forums to ensure your needs are addressed in a relevant forum to ensure that you get focus on issues important to you. All councils have been incorporated as a vital part of our strategy as this has been shown to be a requirement from our members.

If there are additional ideas that you as a member think we should address, I urge you to get in contact with us to voice your opinion.

Yours in automation,
Annemarie van Coller.
The August technology evening we was hosted by Yokogawa at the Bryanston Sports Club.
The theme was to find out more about the difference between a PLC and a DCS, where the PLC came from, some PLC theory, why we use both, and some of the components of these systems.

In bygone years all manufacturing processes were manual, people filling, labelling and packaging. General Motors Corporation decided they needed an automated system which could be easily programmed, easily maintained and reused in future applications. Initially PLCs were used for digital control like conveyor belts, on-off control, timers, counters etc. Now, applications for PLCs include energy management in buildings, steel making, breweries, food and beverage and countless others – but why then a DCS?

A DCS is generally a software platform for everything with enhanced databases, PID control, graphics and tags. A PLC system generally works from the field devices to a controller running on one network, the DCS can bring numerous controllers and networks together and distribute this information to engineering, HMIs, all the way up to business integration control.

We were taken through the questions you need to ask yourself before deciding on a PLC or DCS. Questions like: Will you be doing simple or complex control? What is the value of product manufactured and the cost of downtime? What does the operator need to be successful?

All this led to some lively debate and discussions of actual examples that individuals had experienced in their plants.

The effects of accidental fires or explosions can be devastating in terms of lives lost, injuries, damage to property and the environment, and to business continuity. An explosion is the sudden chemical reaction of a flammable material with oxygen with the simultaneous release of high amounts of energy. Flammable materials may be present in the form of gasses, vapours, mist or dusts.

In order for an explosion to occur three conditions must exist: flammable material, oxygen and an ignition source. Purge and pressurisation is a protection method used with Type 4X (SANS 60079-2:2015) enclosures in a classified area. The enclosure is initially purged to remove any internal explosive gases or dust. Once this is accomplished, the enclosure is pressurised with a protective air or inert gas, preventing volatile gasses from entering in order to avoid an explosion.

This was an educational discussion, which attendees found intriguing.

At the technology evening on 1 August, Katlego Setwaba from Pepperl+Fuchs gave a presentation on ‘Explosion protection with a focus on purge and pressurisation’.

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All instrumentation and control related mechanicians, technicians and engineers are welcome to attend the monthly technology evenings, planned dates for the rest of the year are:

Thursday 3 October and Thursday 7 November. All presentations earn CPD points for ECSA registered individuals. Enquiries can be directed to branch chairman Johan Maritz (+27 82 856 3865).
Vaal branch

At the August Technology Evening, Busisiwe Zikalala from WIKA gave a presentation titled: Sensor protection methods.

Process sensors come in many forms. In addition to the big four: temperature, pressure, level and flow, process sensors are used in many applications and are designed to take accurate measurements of the process. Busisiwe’s presentation covered the following issues:

Selecting a protective method: The amount of harmful exposure a sensor receives from the environment and harmful constituents in the measuring process depends on what is being sensed and the environment itself. Different packaging is required to cope with and survive the specific application. Two major considerations for protection are at the sensing element/transducer level or at the sensing module level.

Limiting factors of protective methods: The characteristics of a sensor developed for a given application are strongly determined by the requirements of the application and by existing sensor science and technology.

Thermowells: These protect sensors from damaging effects of the measured substance and allow removal of the sensor without compromising the process or environment. The well dimensions should provide sufficient strength to withstand stresses imposed by vibration, pressure and flow. However, sufficient immersion length is necessary for accurate temperature measurement and a large diameter increases response time. It is thus a question of striking the best balance.

Wake frequency: The biggest cause of thermowell failure is vibration due to flow of gas or liquid perpendicular to the thermowell (‘von Karmann effect’). The natural resonant frequency of the thermowell (function of mass, diameter and length) should be kept well below the wake frequency of the fluid/gas. If the two frequencies coincide, the resultant vibration can cause mechanical failure.

ScrutonWell design: This design reduces the amplitude of oscillation by more than 90%, which allows easy and fast installation of the thermowell without expensive and time-consuming rework on site. Thus no Wake frequency calculation required.

General sensor issues: Incorrect readings due to improper mounting; sensor drift due to build up; complete sensor failure; slow response due to dead time or blockage; and mechanical damage.

Durban branch

The Durban branch’s September technology meeting was opened by our COO, Johan Maartens, giving a brief overview of the reasoning behind the changes to the SAIMC’s organisation. He clearly and concisely explained the benefits in terms of our ability to influence policies through formation of a Suppliers Advisory Council, with us now having representation on President Ramaphosa’s working group on Industrie 4.0. The revised structure will remove the existing requirement for the majority of Council members to be ECSA Registered.

The meeting continued with Robert Wright, MD of RJ Connect, who began his talk by observing that there is a need to look at what Industrie 4.0 can do for us in real life. There are plenty of seminars on the subject with lots of theory, but not so much about plans that exist for it to be applied or what the next step may be.

Rob focused on a practical application in which a Computer Numerically Controlled (CNC) machine’s production was optimised through the use of cloud-based systems and applications. The need for using Big Data was graphically demonstrated by the huge contrast between information obtained at very different sampling rates; only the high sampling rate making determination of cutting tool life expectancy predictable so that finished product quality remained satisfactory. In most production facilities, checking the end product is not the answer to plant optimisation if use of information from within the process can reveal where an item or procedure is nearing the point of failure. No talk on this topic would be complete without discussing the need for data security, and also the cost of implementing more extensive use of cloud-based systems, both of which were brought to everyone’s attention.

Hennie Prinsloo thanked Rob for his interesting and very informative talk before the large group of more than 60 adjourned to enjoy networking over food and drinks to the usual high standard of the Durban Country Club. It was gratifying to see that 13 students were among those benefiting from attending the meeting.

Kind regards,
John Owen-Ellis (Durban Branch Secretary)
Johnson Controls launches Technology Contracting in Africa

Governments and businesses in Africa are making sizeable investments in smart buildings, precincts and cities. However, ‘smart’ is not easy to do. To address the growing challenge of planning, integrating and maintaining a multitude of different highly connected systems, Johnson Controls is launching a new offering in the Africa region called Technology Contracting.

"With technology advances and an explosion in cloud connectivity, a new approach is needed to construct and run smart buildings," says Archibald Makatini, regional general manager at Johnson Controls in South Africa. "Technology Contracting provides the needed expertise and oversight to plan and coordinate the implementation, then optimise the performance of the many different engineering, electrical, building and IT systems necessary to power a smart facility. This offering has been available internationally for over a decade. Now, with a growing number of smart facility and smart city investments in Africa, Johnson Controls is committed to building the capacity and resources to power an African Technology Contracting team."

What technology contracting offers
Technology contracting provides a single point of control and accountability from planning to running a facility. It reaches across design-assist to installation, integration, commissioning and maintenance of complex building, business and specialty systems.

Johnson Controls is one of a very few providers that can offer technology contracting with confidence. Each of its Technology Contracting clients are assisted by a dedicated project team comprising technology, engineering, facility management and other experts with global experience. "Our goal is to build a team that not only draws on Johnson Controls' global expertise but has a deep understanding of the challenges specific to the continent," he says.

Tipping point for Africa
Technology contracting is rapidly becoming essential in Africa as traditional approaches fail to deliver the expected benefits of smart construction. "Digital technology is opening up a wealth of new opportunities," notes business development manager, Marius Brits. "Mass urbanisation is making it a priority to put in place the fundamental infrastructure needed for smart buildings, facilities and cities. We are already seeing the first smart cities being planned and built in Zambia, Ghana, Mauritius and Kenya. We are also seeing smart airports, universities and hospitals being designed. However, it is also becoming vital to invest in smart building capabilities for existing buildings to ensure security and cost efficiencies can be achieved.

Johnson Controls, with its HVAC, building management, security and fire systems, with sophisticated facility management services, is positioned at the juncture of electronics, engineering and information technology infrastructure and systems, and is increasingly being approached by local partners and customers to provide technology contracting services. African investors, construction houses and design, engineering and technology suppliers are facing the reality that traditional approaches to construction are no longer feasible.

"Historically, every supplier or specialist provider is responsible for the installation of their equipment," explains Brits. "Construction managers are tasked with connecting systems as varied as HVAC, security, communications, IT and business management systems. However, with so many varied systems, technologies and subcontractors involved, there is duplication of product logic and infrastructure, integration is difficult, data is underutilised and the gaps in data security are growing."

Because everything is now digitally enabled and connected, building, plant and information systems cannot be implemented in isolation; to function optimally, they need to be integrated to each other and to back-office and external systems.

Planning needs to begin at the design phase and construction needs to be overseen by a provider with broad and deep capabilities that reach across smart connected equipment, building controls, fire and security, IT networks and systems, and specialty business applications. This approach allows the technology contractor to ensure the building is created not as a collection of systems, but as a functional whole, conceived, designed and delivered with the end in mind.

An ecosystem of expertise
Johnson Controls leverages a partner ecosystem of manufacturers, distributors and value-added resellers to bring proven, repeatable, best in-class technologies to new construction, retrofit or technology refresh projects.

"With our ecosystem of partners, we have the collective brainpower to engineer genius into the DNA of a building, delivering the possibilities of IoT and advanced technologies to support innovation today and tomorrow," says Makatini. "We have the shared experience to provide flexible procurement strategies, material logistics to address the challenges of site logistics and project financials, labour diversification strategies to meet workforce fulfilment requirements, and the lowest market prices by using staged material purchasing or a just-in-time delivery model."

The local Johnson Controls team is moving rapidly to offer Technology Contracting locally. "I believe it's a solution that can add significant value to our customers in Africa and will see a quick uptake," Makatini concludes.

For more information contact Archibald Makatini, Johnson Controls, +27 11 921 7129, archibald.f.makatini@jci.com, www.johnsoncontrols.com
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Autotronix is a recognised leader in industrial automation design and implementation having attained its ISO 9001 certification. Autotronix offers its clients turnkey control system integration services for energy management, PLC/HMI/scada/VSD, manufacture of control panels, applications for water distribution and manufacturing. The company operates from offices in Gauteng and KwaZulu-Natal.

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**PSY International**

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**Process Dynamics**

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

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Contact: jane@technews.co.za
Digital transformation is gaining momentum as it enables new opportunities for value creation, innovative business models and trendsetting forms of cooperation. To connect, create and collaborate for the digital future, Siemens recently hosted a Digital Enterprise Series week to demonstrate insights into digital transformation and launch the Dawn of Digitalisation and its Impact on Africa.

African countries must act quickly and decisively to become leaders on the global economic stage. Digitalisation is providing the continent with the opportunity to accelerate growth and rapidly expand struggling economies – but it’s a small window and decision-makers must get a strategy in place now in order to succeed.

Siemens, in conjunction with Frost & Sullivan, have put together a comprehensive research project outlining the current state of key industries across the continent and identifying challenges and opportunities.

The study – The Dawn of Digitalisation and its Impact on Africa – considers growth predictions and where the adoption of smart technology would be most beneficial to drive sustainable growth. Focus was placed on four key sectors: water, food and beverage, mining and manufacturing.

Key findings of the report include:
- The adoption of digital technologies, innovation as well as a range of digital customer offerings are expected to remain varied across industries, markets and geographies.
- While advanced analytics and digitalisation are witnessing growing adoption across certain industry sectors, such as automotive, there is a real opportunity for adoption of these across industry sectors such as the mining and food and beverage industries, which are significant contributors to major African economies.
- Manufacturing, while the most mature in its transformation and adoption of digital technologies in Africa, remains a marginal player struggling to make a bigger impact on country GDPs.
- In the water industry, expenditure in water infrastructure has been low when compared to the global average. Inadequate investment in infrastructure coupled with poor water utility management has resulted in a greater need for development of the water sector.
- In the mining industry, which has been witnessing subdued investment, rising cost pressures and increasing labour issues, a combination of mechanisation, efficient extraction of resources and better use of data can make it easier for mine operators to cut costs and create a leaner and more efficient mining operation.
- The findings from the study are just a starting point. Siemens hopes it will begin a dialogue and provide a framework to some of the unique opportunities that exist in these critical industry sectors.

Water and wastewater

Situation snapshot

Less than 1% of the world’s water is potable and Africa has the largest number of water-scarce countries in the world. Most of the continent relies on rainfall and surface water for water supply. Many existing fresh water sources have been polluted to the extent that access to clean water stands at about 51%. Water scarcity is a rapidly growing problem for the continent and water projects only account for 1,3% of total infrastructure investment in Africa.

Siemens solutions

In the water sector, Siemens aims to promote greater awareness, among customers and end-users, of the other uses of Siemens flow meters such as water leakage detection, pipeline water management and irrigation flow measurement. By optimising existing infrastructure, Africa can quickly and efficiently increase access to water. As experts in water applications, it offers powerful, innovative technical solutions.

Siemens’ high-precision volume measurement flow meters are used by various Water Boards across South Africa, such as Rand Water, East Rand Water Care Company (ERWAT), Lepelle Northern Water, Umgeni Water and Johannesburg Water. Siemens smart metering helps in water balancing:
- Designed for water industry applications.
- One battery driven water meter DN 25 – 600.
- 10 years battery operation and AC + battery backup.

Food and beverage

Situation snapshot

Rapid urbanisation combined with preference shifts towards formal retail will drive demand for FMCG products in the coming years.

Globally, and in Africa, the industry is dominated by large multinational players. High import duties, free trade agreements and rebates in the form of tax incentives are increasingly being adopted in order to drive local manufacturing growth. This, along with numerous SME accelerator programmes, is shaping this sector to be more dynamic and an enabler of economic growth.

Siemens solutions

Food and beverage manufacturers must consider many factors: a consistently high level of product quality, maximum plant availability, optimum resource efficiency – and, increasingly, the greatest possible flexibility in order to meet more and more individual customer requirements.

A good example of Siemens technology being used to improve plant efficiency is in the beer industry. Simatic PCS 7 with Braumat craft brewing libraries is designed specifically for this...
sector and employs automation to streamline the entire production process.

Advantages include increased production, improved quality, repeatability and consistency. This is done by automating labour-intensive tasks, which historically have been done manually. Alongside automation, Siemens runs various upskilling programmes to ensure staff grow with the company and are enabled to thrive in an increasingly digitalised environment.

Mining
Situation snapshot
Mining is one of the key economic drivers for many African nations. Over the past few years this sector has come under pressure due to subdued investment, rising cost pressures and increasing labour issues.

The crippling strikes over the last few years have gradually pushed mining companies towards implementing mechanisation on a larger scale to improve cost efficiency and remain globally competitive.

Siemens solutions
The challenges confronting the globalised mining industry can only be mastered by raising productivity and by reducing operating and extraction costs. Ever stricter environmental regulations must also be met and safe working conditions ensured.

Enhanced productivity with reduced maintenance and service costs: SIMINE portfolio with complete electrical engineering, drive automation and service packages that increase productivity, improve drive system efficiency and reduce energy costs.

Optimising conveyor belt systems: digital simulation tools to reveal the dynamic behaviour of the whole system, which allows improvements to be made in operation while also minimising idle times.

Optimised processes and operation: Simatic PCS7 with its open, flexible and scalable architecture forms the basis of the Minerals Automation Standard that aims at improvements in competitiveness, through optimised productivity, plant availability and efficiency.

Condition monitoring systems: Sipplus CMS for the early detection of damage to machine and plants to aid decision making for maintenance staff, operators and management.

Today, modern technology opens up new ways to set benchmarks in productivity. Mining companies all over the world rely on state-of-the-art automation, energy, and drilling systems to increase mining intensity with reduced personnel and energy costs. Some of them are able to achieve energy savings of 10-40% through renewable energy installations, innovative energy technologies, and highly automated mining processes.

In addition, Siemens also created The Digital Mining Incubator, which is a co-creation space focused on developing mining engineering competence. The incubator is integrated into the Wits Tshimologong Digital Innovation Precinct and is aimed at upskilling young individuals who have an interest in the mining sector, as well as disadvantaged individuals interested in actively participating in the future of mining.

Manufacturing
Situation snapshot
Growing GDP per capita is expected to boost local demand for manufactured goods while also providing the opportunity to create export-driven manufacturing setups. Local demand alone is not expected to justify investment in the sector.

African countries are rich in mineral resources, which are exported without much value addition and as such have a lower market value. Finished goods are then imported at a much higher price.

Siemens solutions
To succeed in the future Africa needs to seize the opportunities provided by digitalisation right now. Digitalisation promises lower costs, improved production quality, flexibility and efficiency. It shortens response times to customer requests and market demands.

Siemens digital twin
The digital twin in the automotive industry is the precise virtual model of a vehicle or a production plant. It displays their development throughout the entire lifecycle and allows operators to predict behaviour, optimise performance, and implement insights from previous design and production experiences.

Siemens offers the digital twin of product, production and performance that helps reduce the number of prototypes, and predict performance of production and products through a combination of domain expertise and optimised tools.

In South Africa, Siemens technology automates and intelligently controls assembly lines and paint shops. Siemens also plays an integral role in the manufacturing process of the upstream automotive segment with industrial control technology in the component and the tyre manufacturing industries.

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The complexity of water management in mines

Water in South Africa is a very important, albeit a very scarce, resource. In addition to human consumption, all industries are somehow dependent on the use of water in various forms and quality. This makes it very important for all consumers, and especially industries, to manage and monitor the water they consume and release back into the environment. Industries across the globe are encouraged to reuse water as much as possible, and therefore a ‘zero liquid discharge’ policy has already been implemented by various companies in different sectors.

The Department of Human Settlements, Water and Sanitation (DHWS) has updated and refined legislative frameworks with the focus on integrated water resource management (IWRM) to ensure environmental sustainability, socioeconomic equity and efficiency in water use. The department developed policies and regulations that gave effect to water conservation and water demand management (WC/WDM). Sectoral WC/WDM guidelines were developed for the agricultural, industrial, power, mining and the water services sectors.

Water is a critical resource for the mining industry, either in the mining processes, as a feed to the beneficiation of minerals process, or for potable use. With the growing demand and increased scarcity of usable water, it is important for mines to prove that they utilise water optimally, by suitable reuse and reclamation of contaminated water.

Demand management and conservation forms an important part of mining operations, irrespective of whether it uses surface or ground water, and whether it impacts downstream water resources. By implementing state-of-the-art water management systems, mining companies will start to realise the importance of the water they use and will therefore recognise the scarce resource as an invaluable asset in their operations.

The key steps in the implementation of WC/WDM are based on resource protection and waste management and entail the following:

- Prevent pollution and avoid water use by implementing waterless processes.
- Reduce water use by using optimised technology.
- Reuse and recycle water as far as possible in accordance with applicable regulations.
- Disposal of water, or treated wastewater that is not reused, in a responsible manner so as not to pollute the receiving environment.
- Always strive for greater efficiency in the use of water through the process of continual improvement using feedback and adaptive management.

Endress+Hauser has been a valuable partner in the water and wastewater industry globally for more than 65 years, and in Africa for 35 years. Based on this industry expertise, here are some examples of where its products, solutions and services can be utilised in the implementation of the DHWS best practice guidelines (BPG) for water management in the mining industry.

**BPG H3: Water reuse and reclamation**

The reuse and reclamation of contaminated water is important for any mining operation as it indicates that they optimise their water utilisation. All new and existing mines are required to prove this optimisation of water reuse and reclamation by having water reuse and reclamation plans. These must consider the water and salt balance over the lifetime of the mine. Accurate measurement and storage of water abstraction, use and release data will assist in maintaining an historical record of long-term water balance. The Endress+Hauser Proline Promag family of electromagnetic flow meters can be utilised for accurate measurement of all water sources on the mine, whether potable, raw or water contaminated with chemicals. The embedded Heartbeat Technology ensures users are at all times aware of the health of their flow meters and the reliability of their measurements.

**BPG H4: Water treatment**

There are various water treatment processes (from basic to advanced) to treat any form of mine water. The BPG H4 describes the technical methodology that a mine must apply to identify the constituents of concern that may require mine water to be treated for sustainable reuse, or discharge, as a last resort.

Various mine water treatment plants in the Mpumalanga area utilise Endress+Hauser Proline range of flowmeters as well as the Liquiline liquid analysis platform with Memosens digital sensors, often in quite harsh
environments. Using Memobase Pro and Heartbeat Technology, the lifespan of sensors can be optimised by continuously monitoring the condition and status of sensors.

BPG G2: Water and salt balance
The most fundamental building blocks of a mine water management system are often considered to be the water and salt balance. Without accurate and effective water and salt balance, it is impossible to plan, implement, assess and manage the WC/WDM at a mine.

The water and salt balance can be used as a tool to:
- Audit the water usage from various sources.
- Identify where water is wasted, or usage is too high.
- Quantify balances by measurement.
- Locate and quantify sources of seepage and leakage.
- Identify and quantify pollution sources.
- Assist in decision-making.

Although the Endress+Hauser Proline range of flowmeters are calibrated using a certified calibration rig, the mine will be required to prove the accuracy of their water balance by doing traceable flow verifications every 6-12 months. With the Heartbeat Technology embedded in each Proline flowmeter, the verification certificates can be obtained using a laptop (no additional tools or modems) or even remotely over an industrial fieldbus network, where available.

BPG G3: Water monitoring systems
An effective and well-designed water quality monitoring programme is an essential component of the WC/WDM measures at any mine. The following are some of the important aspects for the success of a monitoring strategy:
- It should allow for discrete as well as reliable continuous monitoring.
- The programme should be implemented according to the detail design and specified sampling procedures.
- An operating and maintenance programme must be implemented.
- Data should be populated in a data management system.
- There should be regular audit and quality assurance of the monitoring programme.

One of the ways Endress+Hauser can support a mine in their monitoring programme is by implementing standard or customised smart water monitoring systems. This includes an easy-to-implement solution consisting of the Liquiline water quality measurement system, an edge device connecting to the Endress+Hauser Netilion services and customised app or dashboard, to monitor measurement points remotely. With an API, the data can be made available in the relevant data management system of the mine.

By utilising Heartbeat Technology in the Liquiline liquid analysis systems, the mine can receive early warning of faulty devices or parameters so these can be addressed timeously, ensuring data is always accurate and reliable.

To ensure reliable water usage and quality monitoring, including leakages and pollution events, accurate and reliable measurements are required. Heartbeat Technology in measurement devices organises clear, standardised diagnostic messages of what needs to be done to maintain the plant economically, based on necessities. Along with this, it enables predictive maintenance and delivers evidence for operational reliability and process safety. As the devices run their own diagnostics, proof tests are only necessary in extended cycles.

By connecting all the process measurement instrumentation to the Endress+Hauser Netilion hub, using any of the available industrial communication protocols, the user has access to all the process variables and health information, as well as any maintenance, events and product documentation.

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Level monitoring of groundwater

Much of our drinking water is extracted from subterranean resources. Water that falls to the surface of the Earth drains not only into rivers and lakes, much of it will permeate into subterranean reservoirs. These aquifers are natural underground reservoirs that store groundwater.

Level monitoring of groundwater is critical to understand what is happening to the subterranean water and to allow any exploitation of this resource. Therefore, narrow boreholes are sunk into the soil that allows the groundwater level and quality to be monitored.

These wells will usually include a level monitoring system to keep track of how deep wells and water extraction are affecting the overall groundwater level.

If the soil is composed of permeable sand and rock then as the water is extracted from deep bore wells, the overall water level of the area will be drawn down, as the resource water can easily flow from all separated reservoirs into the deep bore well. Also, if water permeates the soil e.g. due to rain, the underground reservoir is quickly restored and the water level increases rapidly, as the water can pass quickly through the permeable soil.

However, if the water is held in a barely permeable e.g. clay-like soil, then the water resource is stored in many small pockets. When water is then extracted from deep bore wells, the level monitoring of groundwater at the well will show a fast drop in water level and it will take a considerably longer time to replenish from the surrounding area. Also the surrounding monitoring well levels will not change as rapidly as the water resource takes more time to pass through to the deep well.

Contamination must be prevented

Monitoring wells are also used for water quality monitoring, to ensure that pollution is not getting into the subterranean water supply. For example, this may be critical around landfill sites where changes in the water level, e.g. due to an overflow, could allow contaminated water to escape into pure groundwater reservoirs. Both the level monitoring of groundwater and the monitoring of the stored contaminated water form a critical balance. Monitoring systems therefore usually combine level and water quality sensors to detect any contamination.

It is estimated that only 3% of the total water resources on Earth are consumable fresh water, of which less than one-third is easily accessible, for the most part stored as groundwater. Therefore, it is essential to use reliable solutions for level monitoring of groundwater, to preserve these reservoirs and to exploit these resources sustainably.

Groundwater level can be measured using submersible pressure transmitters such as the WIKA LF-1, a transmitter with low power signals and increased life service through the fast response times and a low current consumption.

An ideal transmitter must be suitable for long periods of submersion in stagnant and flowing water. Excellent sealing, special cabling, anti-clogging and overvoltage protection during lightning strikes must also be considered to achieve exceptional protection against failure.

Monitor and control sedimentation

Quadbeam Technologies’ storm and wastewater sensor, the SWW, is a unique suspended solids sensor/turbidity meter. The intended use of the S20-SWW and S40-SWW sensors is the continuous monitoring of suspended solids concentration in non-hygienic industrial and wastewater installations.

Quadbeam uses the four-beam alternating light ratiometric system of measurement for its sensors. Suspended solids sensors and turbidity sensors measure the change in light intensity to produce a relative measure of the solids or turbidity concentration in the liquid being monitored. Some other suspended solids sensors and turbidity meters use only a single beam of light. When a single beam of light is used light intensity can be influenced by not only the solids particles suspended in the liquid, but also any solids/contamination that are stuck to the surface of the sensor and variability of the light source and photo diode as they age. It is therefore critical to keep single beam sensors very clean for accurate readings.

Multi-beam sensors measure across multiple light paths allowing them to use mathematical algorithms where the change in ratio of intensity of light is measured. This system automatically compensates for contamination stuck to the surface of the sensor and variation of the light components in the sensor. For this reason, it is common for multi-beam sensors to be used in process control installations, where a repeatable output is important.

The sensors can be used in a wide range of turbidity and suspended solids monitoring and control applications, including: stormwater sediment monitoring and control, wastewater suspended solids monitoring, flocculant dosing control, environment turbidity monitoring, raw water supply, remote turbidity monitoring, and irrigation water turbidity monitoring.

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For more information contact WIKA Instruments, +27 11 621 0000, sales@wika.co.za, www.wika.co.za
SEW-EURODRIVE (Pty) Ltd supplies an Industrial Gear Unit that offers more efficiency for aeration, mixing and agitating applications with our MC range of Extended Bearing Distance (EBD) Industrial Gear Units.

In process plants, large axial and radial forces occur at the agitator shaft during agitating processes. Traditional designs solve this problem with separate, external bearings that take on the function of the agitator shaft bearings, a solution that very often proves cost-intensive.

Our new EBD concept extends the bearing span across the low-speed shaft and offers stronger bearings within the gear unit itself, which means that in many cases separate bearings are no longer required in the agitator or an over sizing of the gear unit can be avoided. These high-torque MC Industrial Gear Units can be used for the reliable operation of mixers, mounting flanges, agitators and surface aerators.

SEW-EURODRIVE – Driving the world

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Clean water is vital in both consumer and commercial areas, including numerous industrial applications, such as mining, petroleum refining and groundwater remediation, in addition to residential applications. Environmental Operating Solutions (EOSi), a provider of products and services used in water treatment, evolved its business model to include the Nitrack control system, which creates value to plant operators by optimising the dosage of carbon supplements. The first PC-based control system used in this area is ideal to support functions such as remote access to the processes in conventional plants.

Massachusetts-based Environmental Operating Solutions has provided sustainable solutions and technical services for biological contaminant removal in water and wastewater treatment systems in the U.S. and Canada since 2003. President Samuel Ledwell describes the core business of the company as follows: “We currently provide over 550 wastewater treatment plants with safe, effective and environmentally sustainable solutions.”

In addition, EOSi process engineers develop customised control strategies for the specific process configurations of clients and offer services to help monitor plant performance.

Nitrack is the first PC-based control system used to monitor and control biological nutrient removal in wastewater treatment. It collects sensor data from a multitude of inputs and uses this data to control and optimise an unlimited number of treatment processes. The Nitrack system will dose the appropriate amount of MicroC based on, for example, the amount of nutrients present in the wastewater system compared to the end-of-pipe target concentration. The Nitrack systems feature a wide variety of PC-based control solutions from Beckhoff, facilitating simple integration into customer facilities along with improvements in both processing power and remote connectivity options. Remote connectivity functionality enables location-independent plant monitoring by the experts of EOSi or by the operators themselves. However, it also

The MicroC line of supplemental carbon sources forms the basis of the EOSi portfolio and represents a non-hazardous and environmentally sustainable option to remove contaminants such as nitrogen, phosphorus, selenium and perchlorate, among others, from wastewater. The MicroC products contain various carbohydrate, alcohol and glycerin-based supplemental carbon sources, which serve as nutrients for the microorganisms in the sewerage sludge used for biological wastewater treatment. These products are subjected to the most rigorous quality control processes.

PC-based control offers alternatives to traditional sales models

“Maintaining regulatory compliance at the lowest cost is a common goal for our customers,” says Ledwell. About five years ago, EOSi began a new initiative to help customers further optimise their use of MicroC products. This evolved into providing and later developing their own product dispensing monitoring and control equipment.
entails special connectivity requirements that conventional process control systems usually cannot meet.

**PC-based control finds the right price-to-performance ratio**

When designing the Nitrack system, EOSi wanted the ability to minimise the amount of hardware required to remotely control certain aspects of the treatment process. The PC-based systems provided by Beckhoff offered the right ratio of price to performance for their needs and were equipped with the required communication interfaces. Randy Pulsifer, automation and instrumentation manager, explains: “The main driver here was to develop the Nitrack technology on a cost-effective platform that would allow our team of engineers to openly communicate with customer control systems, while at the same time having the added benefit of standard PC software rather than being restricted to software that can only run on industrial PLC systems.”

The core of the Beckhoff control system is a CP2216 multi-touch Panel PC, offering a 2.2 GHz Intel Celeron dual-core processor in a compact form factor and custom branding for EOSi. Pulsifer notes: “We gain much greater HMI visibility than before with the 15.6-inch widescreen format, and the device seamlessly integrates with our HMI software.” The Panel PC also runs TwinCAT automation software to handle controller outputs used for important process functions, such as pump speeds. EtherCAT Terminals transmit process variables and other plant information to the C6920 control cabinet IPC, which then passes it along to the plant scada, enabling the necessary processing for continuous optimisation of the treatment processes.

“Flexibility is key to the success of the Nitrack initiative. Considering the long lifecycle of water treatment systems, the ability to simply integrate EOSi systems into plants of all types is vital to enhance product value for customers,” explains Pulsifer. “With the EtherCAT system, we have the ability to essentially keep our control platform static and change the distributed I/O equipment as the needs of the customer facility dictate.” Further enhancing connectivity and data availability, the TwinCAT TCP/IP server plays an important role in the implementation process, given the varied nature of equipment used throughout the plants of EOSi customers. Another important factor in the area of public utilities is security: The system integrates directly into existing plant scada systems while remaining on an independent and secure network.

**Controller flexibility flows from retrofits to future plant designs**

EOSi has been pleased with the Nitrack system. “The design used in our old system could only control one element of the treatment process,” concludes Ledwell. “In our first Nitrack installation at a municipal water treatment plant, we control four elements, as well as the HMI, without taxing the CPU of the Industrial PC. We can easily add more control elements if necessary. This robust performance of PC-based control is a huge enabler for our plans to expand the scope of Nitrack installations.”

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**Omniflex eases mine water compliance**

Water licences carry a ‘Burden of Proof’ that the licence holder will not harm the environment or the water system through its activities. This covers the use of water from the system and the responsible discharge of water back into it. Water quality, as a part of environmental responsibility, is a key element to triple bottom line reporting, with responsible water licencee operators needing to provide data for licencing authorities and compliance data for reporting. Omniflex has tackled the challenges for this type of remote monitoring application head on and has dealt with a number of key issues:

- Remote and unmanned sites.
- Solar power.
- Vandal proofing.
- Automated operation 24/7/365.
- Enterprise aggregated data over large geographic areas.
- Maintained historical data.
- Early warning of accidental spillage/releases.

This type of project requires monitoring systems be installed at key sites to track mine water outflows, ensuring that the mine has a complete view of its discharge and treatment of wastewater over its entire operation.

Data collected is shared internally across the enterprise to processing plants and to a GIS system for open reporting, also to the Department of Water Affairs for transparency. Analytical measurements that can be incorporated into the system include:

- Flow rate.
- Total flow.
- Dissolved oxygen.
- pH.
- Conductivity.
- Turbidity.

**Management objectives**

Omniflex provides a cost effective adaptable solution from single point small systems to large corporate enterprise monitoring, allowing the integration of existing equipment and legacy systems to provide the management tools for an aggregated view of the enterprise without the labour intensive capture and collation process. Real-time alerts for abnormal conditions and early warning of accidental spillages/releases are provided through SMS or email services, ensuring the right people are kept informed. The system also enables automated reporting via email or manual download for compliance management, driving environmental action plan reporting.

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Schubert & Salzer controls paper grammage precisely

The Grünewald paper company, headquartered in Austria, recently modernised its process control to improve profitability. Thanks to a new control system and a grammage-weight control valve, the company’s throughput and paper quality have been further improved. Through the introduction of a highly accurate Sector Ball Valve with an internally mounted angle transducer and stepper motor, a significant stabilisation of the process could be achieved together with improved quality at markedly higher throughputs.

The production of papers with grammage in the range of only 18 to 60 g/m² demands very accurate process control. Grünewald, with an annual capacity of 50 000 tonnes, supplies largely food contact paper in rolls for the production of food bags, waxed paper or flower tissue paper, as well as paper table cloths.

The existing outdated system was replaced by modern process control in order to stabilise paper weight and allow increased production. This necessitated the increase of control valve size from 100 to 150 mm incorporating a Schubert & Salzer DN 150 Ball Sector Valve.

The former valve fitted with a stepper motor operating at 5800 steps proved to be unable to maintain accurate tolerance of the weight. “With a larger valve every incorrect positioning step caused more trouble than would be the case with a smaller valve,” said Reinhard Christes, head of electrical, measurement and control engineering at Grünewald Paper. “The change of valve size led to a completely inadequate level of accuracy and the consequences were unacceptable fluctuations in the paper grammage. For that reason the stepper motor was replaced with a newly developed precision servo motor drive from Schubert & Salzer.”

Precise volumetric flows require targeted measures

The servomotor can be configured in the factory to customer requirements for a command signal either via an analog positioning signal (4 to 20 mA) or through a stepper/directional control with a signal level of 24 V and 400 Hz maximum input frequency. The activation of the positioning drive is performed either by CAN-Bus or with Profinbus. The drive control via stepper/directional control is performed, depending on process and/or accuracy requirements, in such a way that the 90° rotational movement can be achieved within a range of 1000 up to 8192 steps. Elimination of backlash is done by the use of compact planetary drive. In this way, the set number of steps corresponds exactly to the actual number of positioning steps transmitted to the ball sector and not to the number of steps of the motor. The vital feedback for uncompromised control accuracy is supplied through a 15 bit absolute-rotational angle transducer which is attached load-free to the bottom trunion, and records the current position of the ball sending this as a digital signal to the control system.

This control circuit, monitoring valve movement internally, ensures that the very highest level of accuracy is achieved between positioning signal and the actual valve position.

Activated through an analog positioning signal the positioning time for this valve drive over a 90° rotation can be set in a range of 1 up to 300 seconds. The control system is enclosed in a compact cabinet. In addition, this delivers an analog return signal which can be evaluated by the equipment controls.

“With this new precision drive system all our problems were solved at once. This 8000 step resolution certainly supplied the basis for the solution but the valve’s internal positioning signal direct to the drive is the outstanding feature of this valve drive,” said Christes.

High control accuracy without hysteresis

Hysteresis is often an underestimated problem with control valves. High levels of control accuracy require a backlash-free transmission of the drive to the valve functioning unit. Only then does a positioning signal correlate with the parameterised opening angle of the valve and the corresponding volumetric flow. With the combination of a very accurate valve drive and ball sector valve, Schubert & Salzer Control Systems has succeeded in producing a precision valve unit for even the highest volumetric flows.

In addition, the resolution of more than 8000 steps to drive the valve through 90° reduces the hysteresis under 0.02%.

In this way volumetric flows, such as in the case of paper manufacturing, can be controlled and regulated to extremely precise levels. “We can now correlate exactly the valve position of the paper grammage regulating valve to a specific material volumetric flow and the valve adopts precisely this position setting” said Christes. “Thanks to the new servo drive of the grammage control valve from Schubert & Salzer, we can run our grammage weights much more accurately than ever before. We are producing today with significantly smaller longitudinal weight fluctuations. The more accurately we run, the better this is for the whole line. This precision valve drive also has an impact on the dosage metering of additives. Since there are no more fluctuations in the system, the dosage metering also works considerably better.”

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Ageing sawmills and sugar mills in KwaZulu-Natal represent a significant growth opportunity for SEW-Eurodrive to introduce its latest energy-efficient technology. This is an increasing trend as both the pulp and paper and sugar industries strive to cut costs and boost productivity.

This is according to Clive O’Reilly, branch manager for KwaZulu-Natal, who is based in Prospecton, Durban. The Durban branch is one of the key strategic locations for the company. Apart from its significant stockholding, the branch also has a repair and service capability, an assembly line for new drive units, and even an in-house spray-painting facility.

While pulp and paper and sugar are highly specialised industries with specific requirements, SEW-Eurodrive is able to meet most of these needs with its standard geared units and industrial gearboxes, which are assembled locally. “These are energy-intensive industries, and therefore energy efficiency and optimisation are key,” stresses O’Reilly. “This is why when it comes to standard IEC motors our range plays such an important role.

“The opportunity for growth in these sectors is substantial, especially as so many sawmills and sugar mills have old gearboxes long past their service life, some of which have been running 20 years and longer. Not only do these now need to be replaced, but the sector is looking to leapfrog to the latest technology at the same time.”

While the older drive trains comprise traditional components such as sprockets and chains, the latest trend is for direct drives onto the application itself. This reduces maintenance for end users, as it means less stockholding of critical spares such as V belts, pulleys, sprockets and chains, and increased efficiency simply due to the fact that it is a direct drive as opposed to a traditional mechanical system.

The Durban branch also has a technical team that can attend to any issues on-site, such as emergency repairs or breakdowns. “Our fast turnaround time on both delivery and aftermarket service is a key differentiator for us,” concludes O’Reilly. “This is especially important in industries such as pulp and paper and sugar, where any downtime has a major impact on the bottom line.”

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LiquiSonic analysers in pulp and paper

One of the important steps in the pulp and paper industry is the alkaline sulphate process, where lignin is separated from the fibrous material: due to economic and environmental reasons, the chemicals used in this process need to be recycled.

In the recycling process the black liquor will be concentrated and burned to remove organic materials like lignin.

In addition to energy, this recovery process generates a smelt with high salt content, the base material for green liquor. Through causticising with lime, the sodium carbonate in green liquor is converted to sodium hydroxide and reused in white liquor for the next pulping process.

By using LiquiSonic analysers, each process step can be inline monitored and set in an optimal way. The system provides an optimised quality control and productivity increase, especially through fast process monitoring while liquor recycling.

- The analyser finds many applications in the pulp and paper industry:
  - Real-time concentration monitoring of all liquor.
  - Phase detection and separation in different process steps.
  - Black liquor evaporation monitoring.
  - Incoming goods control.
  - Recycled white liquor control.

Advantages of LiquiSonic technology

- Robust and maintenance-free even for hot (up to 200°C) and high coating liquors.
- Layer-free, no steam wash system necessary.
- No frequent mounting and dismounting for maintenance and cleaning.
- Reduced laboratory costs.
- Highly accurate inline concentration measurement of green, black and white liquor (up to 0,1 wt%).
- Ideal lime dosage in causticising.
- Enhancement of operational safety.

For more information contact Sensoquad,
+27 83 357 2828, sales@sensoquad.com,
www.sensoquad.com

Infrared sensors for stock control

Telco's high performance, self-contained infrared sensor series provides a total solution for pulp and paper applications. This industry poses serious problems for photoelectric sensors as the highly contaminated (dust, dirt and grime) environment and high temperatures make it difficult for them to operate reliably and efficiently for any length of time. This is a problem Telco overcomes with its powerful photoelectric products, which ensure penetration of the harshly polluted environment to guarantee reliable detection.

With attachable fibre-optic cables, the sensors can work in a temperature range up to 300°C, while withstandig the high humidity typical to the pulp and paper manufacturing industry. This has made Telco's optical sensors a highly sought-after solution for monitoring, measuring, positioning and sheet-break detection. Direct sunlight, vibration, contamination, or even high pressure water spray, will not influence the performance of this advanced sensor system. The powerful infrared beam, together with a robust mechanical design, ensures that these sensors will not be challenged in any stockyard control application.

For more information contact Gail Norton Instrumentation, +27 31 701 4861,
telco@telcosa.co.za,
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Hotspot detection in pressboard manufacturing applications

In the building industry, there is a product used that is commonly referred to as pressboard, also known as chipboard. Sheets of pressboard are typically 1.2 m x 2.4 m in size and are used in the construction of walls, sub-floors and rooftops, as well as underneath real wood veneers for low cost furniture manufacturing. To make this board, the mill chips up logs and all the scraps that are left from making lumber and other wood products. The chips are literally glued together and formed into sheets, which can have different thicknesses, depending on use. To bond the material together, the board is pressed between two heated rollers. The boards are then heated to between 100°C and 200°C. One problem that can develop with this process is that some of the chips can protrude up through the surface of the board and get so hot that they begin to burn. The hotspot can be as small as 7.5 mm in diameter on boards that are moving about 120 m/min. Spots can be on both the top and bottom of the board. If this is not detected, the board with the burning spot can be placed on a stack with others and moved into storage. This can lead to a fire and even total destruction of the warehouse – all from one single board with a burning spot that was undetected prior to storage.

To detect these burning chips, two ThermoView TV40 thermal cameras can be installed, one to monitor the top surface and a second camera for monitoring the bottom of the board. An area of interest (AOI) is set up to monitor the entire width of the board. When a camera sees a hotspot of 120°C or greater, an alarm is triggered so the board can be moved off to the side for cooling. After cooling, the board is returned to the stack for storage.

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

Ultrasonic sensor for remote water level measurement

Instrotech has available the Senix ToughSonic CHEM range of ultrasonic sensors, in service around the world in some of the most demanding and corrosive industrial environments. They measure a wide variety of materials including diesel fuel levels in rail locomotives and levels of liquid chemicals in the paper and food processing industries. ToughSonic CHEM sensors are also used in object detection and other non-liquid level applications where corrosive gases are present.

The sensors are sealed in Kynar PVDF housings for protection against solvents and can withstand total immersion in harsh chemicals, both acids and bases, without damage. They include the same full-epoxy potting, heavy-duty electronics, ruggedised-piezoelectric transducers and UV-resistant cables that make these sensors robust and durable.

Several fully configurable and simultaneous outputs are provided, including serial data (RS-232 or RS-485), analog (0-10 VDC and 4-20 mA) and switches (configurable as sinking or sourcing). Up to 32 RS-485 models can be used in a multi-drop addressable network using the Modbus protocol – a standard feature. ToughSonic Chem sensors offer the configuration and operational flexibility that all Senix sensors provide. Powerful extended features can be configured using SenixView software. ToughSonic general-purpose sensors can also be used in liquid level applications where chemical resistance is not required.

For more information contact Instrotech, +27 10 595 1831, sales@instrotech.co.za, www.instrotech.co.za
Pair temperature probes with different cable lengths

In heat meters for heating systems, two paired temperature probes are usually used for symmetrical installation. These must have identical cable lengths to comply with the legal regulations. Now, Jumo has developed a technology that enables the implementation of different cable lengths with one probe. Costs are reduced as a result.

The new process enables different sleeve types, cable colours and identification markings for one temperature probe pair. These combinations are available for all OEM versions that have a current design type and have that type examination certificate. The only limitation is that the temperature pairs that have different versions must be firmly connected to the arithmetic unit and that they must not be exchanged (this is for so-called compact heat meters). In addition, the user must declare conformity for the compact heat meter if the unit is for commercial purposes. The Jumo type examination certificate can be used as a reference.

As a market leader for temperature probes for heat meters, Jumo has decades of experience in R&D of new products for this industry. The new technology means that the sensors – compared to normal pairing – are paired in the temperature probes using a newly-developed process. The different cable lengths cause a difference in the electrical resistance at the end of the probe.

This difference can be calculated and transmitted to the customer via data sheets or via the content of a 2D barcode on the label. The barcode also contains other data such as characteristic line parameters, probe data, approvals or even customer-specific texts.

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Why does water hammer affect pressure gauges and transmitters?

Water hammer is a high pressure surge or wave created by the kinetic energy of moving fluid when it is rapidly forced to stop or change direction, altering the liquid’s velocity. Rapid stopping or starting or changing of direction of an incompressible fluid like water or oil in a system is caused by a variety of valves or pumps.

Myth: A pressure spike cannot exceed the normal pressure in the system.

Fact: Pressure spikes can reach up to eight times the system pressure.

Even though pressure spikes may only last milliseconds, the potential damage is lasting. One of the main concerns of hydraulic and other system designers is how to eliminate or minimise water hammer. Methods and formulas for calculating water hammer pressures are freely available online.

Pressure gauges and transmitters fitted to measure normal line pressure at the receiving end of these ‘pressure spikes’ are often irreparably damaged if not suitably protected.

Why does water hammer affect pressure gauges and transmitters?
Pressure gauges and transmitters are designed to measure pressures up to the full scale value of the instrument. For short periods, these instruments may accept an overpressure of a percentage of the rated full scale pressure, without permanent damage.

The measuring sensor of pressure gauges (bourdon tube), and transmitters (diaphragm), are normally manufactured from a flexible elastomeric type material to ensure accuracy and repeatability.

Good quality pressure gauge bourdon tubes are designed, manufactured and tested to withstand (for short periods) up to 1.3 times the rated pressure in the case of normal pressure gauges (up to 5 times more in the case of some diaphragm operated pressure gauges that do not use bourdon tubes, but with a limited range of max 2500 kPa) without permanent damage to the instrument. Most pressure transmitters can, for short periods, withstand 1.5 to 2 times the rated full scale value without permanent damage. Pressure spikes exceeding these limits can cause the elastomeric sensors to deform permanently, rendering them unable to return to zero. Accuracy and repeatability may be affected and in extreme cases, rupturing of the sensor may occur.

Gauges are sometimes returned to the manufacturer for investigation, completely over-pressured and often with a ruptured bourdon tube. Once informed of the gauge’s condition, we often hear, “But how can it be possible? It is a 1000 kPa gauge and the pump can generate a maximum of 600 kPa.” Water hammer is the most likely cause of damage in such a scenario.

Protecting pressure gauges and transmitters against water hammer
The progression of the water hammer shockwave needs to be detained and slowed before reaching the instrument sensor. SA Gauge manufactures several such devices in order to achieve this. The most common and economical, is a simple threaded snubbing screw that screws into the process connection of the gauge, restricting the pressure port to minimise flow into the gauge. In severe cases, a length of small bore capillary tube is attached to the snubber to increase the effectiveness. Other devices like external adjustable flow restrictors, piston type snubbers and needle valves are also available to choke the offending pressure surge to an acceptable level.

It is important to note that these devices will not protect the instruments against sustained overpressure, which will still damage the instruments. An overpressure protector will be required in these cases.

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Gauge before water hammer.

Overpressured gauge – result of water hammer.
In 2016, VEGA introduced the Vegapuls 64, its first radar level sensor for liquids that measures at a frequency of 80 GHz, which allows considerably better focusing of the radar beam. With Vegapuls 64, measuring is made easier and more reliable, even under difficult conditions such as tanks fitted with heating coils, baffles or agitators.

Until then, a radar sensor with a transmission frequency of 26 GHz and an 80 mm diameter antenna had a beam angle of approximately 10°. With the same size of antenna, the 80 GHz device has a beam angle of only 3°. This allows the sensor to be used in vessels with internal installations or heavy build up on the walls, because the focused microwave beam simply avoids these obstacles.

Radar sensors with a larger dynamic range have a higher measurement certainty, and these sensors can be used for a wider range of applications. With Vegapuls 64, media with poor reflective properties – a low dielectric constant – can be measured with more certainty than with previous radar sensors. Foam, turbulent product surfaces, condensation, or build up on the antenna are no problem. The sensor measures more reliably due to its greater measurement certainty. It has an accuracy of 2 mm and a measuring range of up to 30 m.

The device is ideal for wide use across industries ranging from demanding applications in the chemical industry to hygienic applications in the pharmaceutical and food industries. The relevant approvals for this sector, such as 3A and EHEDG, are available. The 80 GHz device can be used universally for the majority of industrial level applications. Since the sensor can be equipped with a small antenna, there is hardly a mounting location where it will not fit. Other benefits include:

- Ideal for use in vessels with small process connections, such as those used in the pharmaceutical, biotech and food industries.
- Media can be measured with much higher accuracy than before – right up to the process fitting and down to the very bottom of the container.
- The new sensor can easily be installed using existing process connections, eliminating the need for costly equipment modification.
- Since radar signals pass through viewing windows and glass, the sensor can also be mounted outside such containers.
- The larger dynamic range provides a higher measurement certainty, especially when there is build-up, condensate, foam, or a turbulent liquid surface in the vessel.
- Radar technology is immune to process conditions like changing temperature, pressure and density. With Vegapuls 64, levels can be measured in applications where the process or structural conditions were previously not suitable for radar.

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Top data management on the DIN rail

The data manager family of Endress+Hauser is growing. To meet the strong demand from the market for a smart, compact DIN rail data manager for mounting in the control cabinet, development of the RSG45 DIN was initiated about a year ago. Short time to market, compact design and the expansion of the display options of the integrated web server were the key objectives. Positive feedback from field tests confirmed this and the expectations were fulfilled.

**Full compatibility in multi-functional applications**

The RSG45 DIN is 100% hardware and software compatible to its counterparts and has the same possibilities as the display devices. The I/O channels can be ordered freely configured with HART or universal inputs. All interfaces and fieldbuses are also available and it offers an attractive entry price for system builders, OEMs and skid builders. When used as a data and application manager, preferably for communication tasks, an on-site display is often not necessary. The installation is integrated in the control cabinet, allows easy wiring and the visualisation and operation is carried out via the web server which has been considerably extended in terms of its functionality.

To that end, an application (e.g. plant visualisation) can be accessed through a web browser window. A connection can also be established with cordless devices such as tablets and access is of course possible via the Internet from anywhere in the world. With the already well-known application packages such as mathematics, energy, waste water, etc., the device is suitable for applications in most industries. Through the connection using the Ethernet-based fieldbus to automation systems, the unit is suited to use as an intelligent remote I/O with data pre-processing, application packages and control functions. This is a key differentiating feature in comparison to conventional remote I/Os.

**Turn data into information**

One of the strengths is the wide range of communication capabilities. With integrated digital communication from the sensor up to higher-level systems (ERP, cloud, etc.), the device offers almost unlimited possibilities for communication. Particularly interesting is the possibility of a second communication channel, which is increasingly required in automation. In addition to the transmission of measured data in real-time via fieldbus to the automation system, Ethernet (TCP/IP, Modbus TCP/IP, OPC, etc.) is available for the transmission of large volumes of data as well as diagnostic and analysis functions in the control level or the cloud databases.

Many sensors, e.g. Endress+Hauser flowmeters not only provide the actual measured value, such as flow rate, but also temperature values, density, condensate, etc. using the HART protocol. Here, the RSG45 DIN is in its element. As an intelligent HART gateway it can pre-process values, perform calculations, and link them together. The measured data or results are then transferred via fieldbus or Ethernet. Device connectivity and the provision for further data processing are the basis for future solutions and cloud-based data management.

**iTherm TrustSens calibration monitoring**

For the iTherm TM37x TrustSens, the RSG45 offers the new functionality – TrustSens calibration monitoring. In an application with TrustSens temperature sensors connected via HART, the device monitors the sensors for self-calibration. As soon as a TrustSens reports a completed calibration by changing the calibration counter, the RSG45 retrieves all relevant data from the sensor, provides the data with a time stamp and stores it in a database. Directly on the device, via web server or via the FDM software, calibration certificates can be generated from the data records. Deviations from the reference temperature sensor are therefore continuously logged. Customers gain 100% transparency about their processes and reduce the risk of unacceptable deviations in temperature measurement.

**Simple ordering process across all device variants**

The Memograph M DIN rail is the new basic device in the order structure of the RSG45. The display, with the navigator as well as the stainless steel touch display, is available as an option with an additional charge. Customers who already use the RSG45 with one of the two available displays will not be required to change their order structures. Due to the integration into the existing structure, no adjustments of the validation and approval processes are required.

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Kobold’s portable DUC-MP and the stationary DUC-MF are designed for continuous flow measurement. They are highly accurate and drift-free operating flowmeters for liquids in filled pipes. The devices are hygienic, leak proof and monitor all aggressive and toxic liquids without problem. A special advantage is that the ultrasonic sensors are clamped onto the outside of the pipe, so no cutting the pipe is necessary for installation. Similarly, there is no requirement for process shutdown, significantly reducing the operating costs.

The robust Quickfix mounting kit enables precise and quick sensor installation. With the Quick Setup option, the transmitter can be configured in less than one minute, and in less than two minutes, the sensors are mounted onto the pipe.

By default, the transmitter operates at medium temperatures from -40 to 150°C and flow rates of up to 30 m/sec. in pipe sizes from DN10 to DN6000. DUC works on the high-precision ultrasonic transit time method. The AND-technology (anti-noise deflector) results in the ultrasonic waves being guided and coupled in such a way that unwanted echoes and signal variations are avoided. The flow rate is measured periodically, typically 50-150 times per second. Thanks to the latest digital signal processing, DUC operates drift-free and reliable even under influence of EMC radiations or unwanted machine noises.

Accurate measurements are possible even where conventional devices fail, for example in extremely unfavourable conditions, such as high particle and gas pollution situations. The clear menu-structure, easy operation via eight buttons and the large graphics-capable text display facilitate measurement. Battery operation, as well as the 4 GB memory card, makes the portable version of DUC ideal for temporary measuring tasks.

**Application areas**

- Power plants (cooling water), district heating, pump protection, condensate and boiler feed water measurements.
- Water and wastewater treatment plant flow, drinking water networks, verification of water meters, pump protection, distribution and consumption measurements, leakage detection.
- Facility management.
- Chemical and petrochemical industry.
- Food and beverage (correct hygienic measurement of media, heat volume measurement in energy supply).

*For more information contact Instrotech, +27 10 595 1831, sales@instrotech.co.za, www.instrotech.co.za*
Density compensated pressurised vessel level measurement

The traditional approach to level measurement in closed vessels such as boilers, evaporators, crystallisers or distillation columns, has been to use a conventional differential pressure (DP) transmitter with external water filled ‘wet’ legs connecting both the high and low-pressure sides of the transmitter to the vessel. The use of DP transmitters for closed vessel level is ideal because of their low cost, ease of installation and high reliability. However, the output of a conventional DP transmitter in this application will have inaccuracies caused by changes in static pressure, the densities of the water in each leg, and the density of the fluid in the closed vessel.

The Foxboro solution
The Foxboro IMV31 density-compensated level transmitter provides a new approach to closed vessel level measurement. While maintaining all the advantages of DP transmitters, it uses multiple measurements and on-board level calculations to provide a more accurate measurement. This eliminates the need to make similar level calculations in the control system.

The new instrument is based on Foxboro’s proven multivariable transmitter technology, which was originally developed for flow measurement. The heart of the device is its ability to conduct on-board level calculations based on multiple measurements and fluid density calculations. The transmitter has a pressure sensor and a differential pressure sensor, as well as an internal temperature sensor. It also has the ability to power and monitor an external RTD temperature sensor.

The transmitter continuously calculates the unique fluid densities based on measured pressures and temperatures, and uses this information along with the DP measurement to calculate an accurate density-compensated liquid level. The densities of both the fluid and vapour are calculated separately, based on the pressure measurement and vessel temperature. The transmitter has an RTD input and can also use the saturation stream table’s temperature corresponding to the measured vessel pressure in calculating densities.

Results
Regardless of the size of the drum and the saturation pressure, the IMV31 significantly improves the accuracy of drum level measurement over conventional DP transmitters and automatically provides dynamic compensation for varying pressures and temperatures.

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Tough OEM pressure switch from WIKA

The PSD-4-ECO pressure switch from WIKA is designed for harsh ambient conditions, and is optimised for OEM integration. With a diameter of 29 mm, the model is very slim and through the arrangement of the electrical output, it can be installed so that it uses little space. The display head can be rotated through 335° and the display tilted through 180° to allow easy viewing for the user.

With the model PSD-4-ECO pressure switch, it is easy to determine if the process is operating within the desired pressure range.

The instrument can be parameterised such that the digital display lights up green when the value is within the defined pressure range, and red if not. In this way, problems can be identified early.

The instrument is designed for medium temperatures from -40 to 125°C. In addition, it withstands mechanical shocks up to 50 g and high electrical loads.

For more information contact WIKA Instruments, +27 11 621 0000, sales@wika.co.za, www.wika.co.za
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Integrating IT with Operations Technology – a CIO perspective

Over the past few years there has been a growing realisation that traditional IT (Information Technology) and OT (Operations Technology) must work very closely together in order to unlock new value. Digitisation projects, spurred on by Industry 4.0 and technological advances, have opened up many possibilities to create new value. The nature of digitisation projects in manufacturing is forcing the blurring of the lines between the IT and OT silos, and this will often require reorganisation and create new roles in the business.

First, some definitions
IT: Information Technology is a relatively well understood concept – it relates to the software and hardware used to process and manage information in a business. Business information can either be transactional and structured in nature (for example financial and accounting systems); or it can be unstructured in nature (for example documents and e-mail). Enterprise software can be a fast changing environment with the life-cycle of an information management system being as little as three years before an upgrade is required.

OT: Operations Technology, on the other hand, is the software and hardware used to directly monitor and control physical devices. This includes process automation and control systems. While this area is not immune to the increasing rate of technological change, when compared to the world of IT these systems are relatively stable. DCS and PLCs can have an expected life span of several decades before requiring an upgrade.

Merging IT and OT
The forced merger of IT and OT is in part brought about by the greater connectivity provided by the industrial Internet. This allows, for example, an IoT device to connect to a cloud service, which then provides information about events that alter business processes. Another example is a smart sensor that connects using standard TCP/IP protocols to the plant network and which is read from the Internet using standard web browser technology.

Most of the companies I have worked with in the past few years understand the importance of integrating IT and OT. Some have taken proactive steps to merge the IT and engineering departments into a single team reporting to a single manager. But merging of teams is only the first step in the process. What is often needed is a fundamental realignment of the way these teams think about their role in the organisation. Cultural barriers need to be dismantled and many historical assumptions challenged. The best practices from each of the two domains need to be adapted and applied to the new combined entity. This change process will require strong and experienced leadership.

The manufacturing CIO perspective
From the CIO perspective, this merging of functions can be a daunting challenge. CIOs typically have a clear set of responsibilities:
• Develop and execute IT strategy.
• Manage risk.
• Ensure IT governance and compliance is being managed.
• Striving for operational excellence across the business.
• Digitisation programmes that automate and enhance business processes.

When you overlay the requirements of managing OT to a CIO portfolio it becomes

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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clear that while the overall principles might remain the same, some changes will be needed.

Taking each of these areas of responsibility in turn:

IT strategy needs to now incorporate operational technologies. Strategy always needs to be business driven. The combined use of industrial Internet and traditional IT systems is an enabler that could allow the business to exploit new opportunities in the market. The technology platforms chosen for IT and OT therefore need to be strategically selected for integration going forward. Systems should allow for rapid re-configuration as the business becomes more agile and responsive to changing market requirements.

IT risk is a board level concern. The risk of cyber-attacks remains prevalent and the complexity of the necessary control measures is increasing. When IT systems are connected directly to OT systems, the ‘surface-area’ for a cyber-attack is significantly increased. In addition, the consequences of an attack are higher when systems are integrated, directly threatening the integrity of processes and the safety of people in the plant. Enterprise risk is typically managed by developing a risk register which identifies specific threats and ensures that control measures are effective and are being managed. Risks are often associated with opportunities, and the risk management process should also identify new opportunities where technology can be used for competitive advantage.

IT governance and compliance ensures that all the activities in the business comply with applicable legislation and with industry standards (such as ISO) as well as with internal standards (such as standard operating procedures etc). IT governance and compliance involves putting in place the required policies and standards, and then actively managing these through a process of auditing and corrective measures where necessary. The principles of governance and compliance apply to IT and OT equally. Compliance should therefore be managed together in a common process, and not in IT/OT silos as might have been the case previously.

From a traditional CIO perspective, IT operational excellence implies efficient business processes that are supported by appropriate, cost effective IT/business systems. In manufacturing plants, significant reliance is placed on OT to optimise and run the manufacturing process, and in this area small changes of even a few percent can translate to large cost savings (or additions). When considering the system as a whole, the CIO will most likely need to reprioritise deployment of scarce skills and resources in order to achieve the biggest impact for the business. This reprioritisation may require abandoning lower value IT projects in favour of projects that optimise the core manufacturing process as part of the total value chain.

Finally, the modern CIO might also be tasked with digitisation in the business. Here the opportunity for new value often results from out of the box thinking about automation and exploiting enhanced services provided by the internet. When IT and OT platforms are seen as a combined whole and the data is combined, many new digitisation opportunities suddenly become possible. Without this combined perspective digitisation projects will be tactical at best, continue to operate in silos and are unlikely to be sustainable.

Concluding remarks
The role of the CIO therefore becomes more strategic and more impactful in a manufacturing company when OT is included with the traditional IT role. Success here will require a new set of skills. Despite the challenges of changing any organisation, the foundations of good IT management will still apply going forward. Ultimately the new CIO role becomes more of a leadership role, responsible for propelling the organisation along its digitisation project to achieve success in the market.

The power of data
Gain access to important information with ProSoft’s new OPC UA-based gateway and data logger.

We can collect this data, but are we able to get to it? This is key to using equipment information to make informed business decisions that can help lower maintenance costs, optimise production, and reduce support and travel expenses.

Two of ProSoft’s solutions released this year show users how to access the data they need to add value.

Making data-driven decisions
The gateway brings together three major industrial automation protocols – OPC UA, EtherNet/IP, and Modbus TCP/IP. This gateway to the IoT sends production information to the MES or ERP. From there, it can be acted upon to make the changes necessary to achieve corporate goals. The benefits of analysing equipment information include reduced maintenance, energy and overall operating costs.

The gateway works by enabling fast data transfers from EtherNet/IP and Modbus devices to OPC UA clients, thanks to an OPC UA server connection. The EtherNet/IP and Modbus TCP/IP equipment can also communicate with each other. The gateway enables 10 simultaneous OPC UA sessions, which is ideal for larger applications.

By connecting equipment that use these two protocols to the MES, one takes the first step to streamlined access and analysis of data that can help to optimise resources.

Access historical data
You’re at your desk, it’s almost time to go home, and you find out you need to go on-site for an issue with a piece of equipment. You’re not quite sure what the problem is, and now you’re looking at a later end to the day and hoping you can troubleshoot the issue quickly.

For applications that involve remote access equipment, the data logger avoids costly network enhancements, storing 16 million time-stamped records.

OEMs can also benefit from using the data logger. The module’s records can indicate whether equipment was tampered with or if the maintenance schedule was followed, helping to determine if a warranty claim is valid.

Knowledge gleaned from devices can help to improve a company’s Overall Equipment Effectiveness (OEE). Studying how equipment performed in real-time applications can help determine if a design can be tweaked.

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Securing and managing devices the modern way

Organisations of all types and sizes are bringing vast numbers of devices into their IT infrastructure and networks. Moreover, these devices are not only smartphones, wearables and tablets because the IIoT is seeing a slew of new devices entering the business arena.

Rezelde Botha, business unit manager for Citrix at Axiz, says the complexity is growing as each new device type that is entering the organisation needs to be managed, and traditional device management software simply is not up to the task.

She says this is becoming even more of a problem, as today’s employees are not office-bound: “Workers are on the move. Some work from remote offices, others at home or while travelling, and this is forcing the workplace to evolve. As IT moves away from desktops in offices to roaming laptops, tablets and smartphones, many businesses are finding the tools they once depended on are no longer adequate.”

Unified management solutions
This is where unified endpoint management (UEM) comes into its own. “UEM is a fairly new technology that aims to deliver a single solution to manage all endpoints within the business infrastructure,” explains Botha. “The benefits are clear. By consolidating management of all endpoints into a single unified platform, the IT department can more easily keep track of the devices within their infrastructure, irrespective of where they are located.”

In the past, businesses had to depend on separate client management tools (CMT) and endpoint management (EMM) solutions to deal with their infrastructure. Now, because CMT and EMM tools work in dramatically different ways, they usually need a whole different set of employees and training to manage each solution.

“Today, UEM unites the capabilities of CMT and EMM in one, total solution, enabling IT to simply secure and manage applications, data, and operating systems across the entire organisation,” adds Botha.

Managing all devices from a single solution makes good sense. Botha explains: “Firstly, it is more cost-effective to allocate budget to one management tool instead of several. Secondly, it boosts operational savings by lowering the number of human resources needed, as well as the training costs associated with those staff. This also means that human resources can be focus on more urgent aspects of the business.

“Moreover, you cannot guarantee user productivity and data protection unless you have consistency across management, security, and usability. Even the tiniest, unintentional differences in management or security policies can leave gaps in the organisation’s infrastructure that enable attackers to slip through the security net and plant malware on the network.”

Implementing a consistent policy makes it far easier to pinpoint, fix and keep an eye on any possible chinks in the security armour. Having consistency in terms of users being able to access the information and applications they need, regardless of where they are located, is also essential for productivity.

Citrix’s UEM solution, Citrix Endpoint Management (CEM), is the modern way for any business to secure and manage its devices. It delivers seamless and secure user access to applications and files on any device, and while giving the IT department the power it needs to manage desktops, laptops, smartphones, tablets across iOS, Android, Windows, Chrome OS, and MacOS platforms.

CEM also offers both on premise as well as cloud deployment models. “Irrespective of which model a customer chooses, Citrix works hard to ensure that its footprint and, alongside it, the total cost of ownership in its customers’ data centres, is kept to a minimum, using the fewest possible number of servers or firewall configuration changes.

This offers several benefits, including a lower cost of SSL certs, as there is no cost for Windows licences,” concludes Botha. “Remember, businesses don’t usually use UEM in isolation. Businesses tend to have one solution for managing virtual applications and desktops, and one for managing the enterprise data. This means a holistic approach, where IT can reduce the time and effort needed to provision applications, desktops and files from a single administration console, is the way forward. This is exactly what CEM offers.”

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Instrument calibration is just one of the many maintenance-related activities in a process plant, but the last thing anyone needs is to have precious resources wasting time performing unnecessary calibrations or using time-consuming, ineffective calibration procedures.

This article examines what an ‘Integrated Calibration Solution’ is, and how it can help make calibration processes more effective, save time and money and improve the quality and integrity of the results.

Improve the whole calibration process with an Integrated Calibration Solution (ICS)

It is not enough just to buy some new calibration equipment or calibration software – that does not make calibration processes leaner and more effective. Instead, all the steps of the current calibration process should be analysed, and, with the help of a suitable solution and expertise, find ways to improve the whole calibration process.

Let’s take a look at a typical calibration process from beginning to end and explore how an integrated system could help:

ICS-summary

Typically, work is planned, and work orders are created in the maintenance management system. With an integrated solution, these move automatically and digitally from the maintenance management system to the calibration software. There is no need to print work orders and distribute them manually.

The necessary calibration details are handled by the dedicated calibration software, which sends the work orders to the mobile calibration equipment. Again, this happens digitally.

While the technicians are out in the field performing calibration activities, the results are automatically stored in the mobile devices, and users sign off the results using an electronic signature. From the mobile device, the results are automatically transferred back to the calibration software to save and analyse.

Once the work orders are completed, the calibration software automatically sends an acknowledgement to the maintenance management software and work orders are closed.

So, the whole process is paperless and there is no need for manual entry of data at any point. It makes it far more effective and saves time. It also helps minimise mistakes typically associated with manual data entry, so it improves the quality and integrity of the calibration data. Furthermore, calibration results are safely stored and easily accessible for review, for example in the case of audits, or for analysis purposes.

As mentioned, improving the calibration process is not just about buying some new equipment or software, but the project should also include improvement of the whole calibration process together with the new tools supporting it. Implementing a new process is a project with a formal implementation plan, ensuring that the new system/process is adopted by the users.

The key benefits of an integrated calibration solution

• Improve operation efficiency – do more with less.
• Automate calibrations and calibration documentation – eliminate all manual entry steps in the calibration process. Use multifunctional tools to carry less equipment in the field and lower equipment life-cycle costs.
• Save time and reduce costs – generate a great ROI.
• With automated processes, get more done in a shorter time – don’t waste time on unnecessary calibrations, let the data from the system guide you to determine the most important calibrations at appropriate intervals.
• With electronic documentation, avoid all errors in manual entry, transcriptions and Pass/Fail calculations.
• Guides non-experienced users.
• Avoid system failures and out-of-tolerance risks.

Using a calibration system that automatically ensures you meet required tolerance limits not only avoids unnecessary system downtime and expensive out-of-tolerance situations, but also ensures the safety of plant workers and customers by helping maintenance staff navigate through safety critical calibrations. A calibration system that ensures the integrity of the data with automatic electronic data storage and transfer and relevant user authorisation also makes audits and data access easy, thus simplifying compliance issues.

For more information contact QTEK Instrumentation & Calibration Solutions, +27 11 391 4598, jacques@qtekics.co.za, www.qtekics.co.za
RS adds food grade maintenance line

RS Components has launched a new range of food grade maintenance products for use in the food processing and catering sector. All RS Pro food grade products are registered with the NSF (National Sanitisation Foundation), an international public health and safety organisation, demonstrating risk reduction compliance.

The handling, preparation, processing and packaging of food products require machinery with moving parts that come into contact with foodstuffs. Keeping this equipment clean and lubricated involves the use of non-food chemical products. NSF certification ensures that such products present a significantly lowered risk to health, and, in conjunction with a robust HACCP assessment, may effectively eliminate risk of foodstuff contamination when used appropriately.

RS Pro Chain Oil is formulated with PTFE and foams on application to cling to chains and penetrate deep into links, providing long lasting lubrication and corrosion resistance. It is certified as NSF H1 (lubricants suitable for use with incidental food contact).

RS Pro Foam Cleaner is used to remove general grime and soiling from machinery. It is a stable foam that clings to vertical surfaces without dripping. It is safe for use on plastics, is biodegradable, and is certified as NSF category A1 (general cleaner for use in all areas).

RS Pro Solvent Cleaner is a heavy-duty solvent with a powerful spray action and good wetting properties for difficult degreasing applications. It evaporates quickly leaving zero residue. It is certified as NSF A8, (degreaser/carbon remover for use in all areas) and K1 (cleaner/degreaser for use in non-food-processing areas).

RS Pro Belt Spray (NSF H1) is an adhesive belt lubricant that improves grip on drive belts, reducing squeak and prolonging belt life. A tacky lubricating film increases pulling power and prevents belt slip.

RS Pro Penetrating Spray (NSF H1) is a fast acting penetrating oil that helps to remove seized fasteners without damaging the head or thread.

For more information contact RS Components SA, +27 11 691 9300, sales.za@rs-components.com, www.rsonline.co.za

Improved design tips balance toward HV motor replacement

The applications knowledge of Zest WEG Group, coupled with the design capability of parent company WEG, now make it easier than ever for old high voltage (HV) motors to be replaced with new improved machines, within the customer’s existing footprint and operational configuration.

“Compared to HV machines designed 20 years ago, advances in technology allow modern motors to be manufactured smaller,” says David Spohr, Zest WEG Group’s newly appointed business development executive who works with customers to optimise their HV motor operations.

WEG’s HV motors are typically purpose-built to meet the precise needs of the customer. While smaller in dimensions compared to the original older HV motors, these motors still deliver the required performance at even higher output and efficiencies.

“As a leading technology provider of a wide range of motor products, we have the capability to design a replacement motor to match the footprint of the original unit,” explains Spohr.

“This means it is not necessary for the customer to modify mechanical infrastructure or electrical design to accommodate an upgraded motor.”

Spohr highlights that the cost of a major motor overhaul could be up to 60% of the cost of replacement. In addition, the advanced technology of new units brings important benefits. Key among these are reliability and efficiency, which means improved operational performance and direct savings in energy consumption.

“When motor failures occur, Zest WEG Group has the ability to conduct a detailed on-site analysis,” says Spohr. “Based on a root-cause analysis, we can provide a failure assessment that will enable the customer to make an informed decision.”

The assessment includes an energy consumption analysis conducted with specialised software.

“There are also significant productivity benefits from a new, more reliable motor,” concludes Spohr. “Unplanned downtime can severely erode plant performance, reduce output and risk supply relationships with customers. All this needs to be considered in the decision to continue repairing old motors.”

For more information contact Zest WEG Group, +27 11 723 6000, info@zestweg.com, www.zestweg.com
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Comtest now offers the Fluke 810 vibration tester, an advanced troubleshooting instrument that enables maintenance teams to collect data, diagnose and solve mechanical problems.

The handheld instrument is designed and programmed to recognise the most common mechanical problems of unbalance, looseness, misalignment and bearing failures in a wide variety of mechanical equipment, including motors, fans, belts, gearboxes, couplings, pumps and compressors. When it detects a fault, the tester identifies the problem and rates its severity on a four-level scale to help the maintenance professional prioritise the order of tasks. It also recommends repairs, while context-sensitive on-board help menus provide new users with real-time guidance and tips.

The 810 uses a simple step-by-step process to report on machine faults the first time measurements are taken, without prior measurement history. The combination of plain-text diagnoses, severity ratings and repair recommendations helps users make better maintenance decisions and address critical problems first. Typical vibration analysers and software are intended for monitoring machine condition over the longer term, but require special training and investment that may not be possible in many companies. However, Fluke’s new device is designed specifically for maintenance professionals who need to troubleshoot mechanical problems and quickly understand the root cause of equipment condition.

Mechanical diagnosis begins when the user places the Fluke tri-axial TEDS accelerometer on the machine under test. The accelerometer has a magnetic mount and can also be installed by attaching a mounting pad using adhesive. A quick-disconnect cable connects the accelerometer to the test unit. As the machine under test operates, the accelerometer detects its vibration along three planes of movement and transmits that information to the instrument. Using a set of advanced algorithms, the 810 vibration tester then provides a plain-text diagnosis of the machine with a recommended solution.

**A new approach to machine diagnosis**

Vibration, on a basic level, is just an oscillation of machines and components in motorised equipment. Sometimes it is a symptom or even a cause of trouble; other times, it is part of normal machine operation. Oscillating sanders and vibratory tumblers, for example, rely on vibration in order to function. In internal combustion engines and gear drives, vibration is to an extent unavoidable. However, most devices are engineered to avoid vibration. Left unchecked, vibration can cause damage or deterioration to equipment over time.

Evaluating mechanical equipment typically requires comparing its condition over time to a previously established baseline condition. Vibration analysers used in condition-based monitoring or predictive maintenance programmes rely upon these baseline conditions to evaluate machine condition and estimate remaining operating life. By contrast, this new diagnostic technology analyses machinery operation and identifies faults by comparing vibration data to an extensive set of rules developed over years of field experience. The software determines fault severity using a unique technology to simulate a fault-free condition and establish a baseline for instant comparison to gathered data. This means that every measurement taken is compared to a ‘like new’ machine.

**Viewer application software**

The included Viewer PC software, compatible with Windows XP and Vista, expands the data storage and tracking capability. With Viewer, users can:

- Create machine setups at the computer keyboard and transfer the data to the tester.
- Generate diagnostic reports in a PDF file format.
- View vibration spectra in greater detail.
- Import and store jpeg images and Fluke JS2 thermal images for a more complete view of machine condition.


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The new FL MC EF 660 SCRJ media converter from Phoenix Contact enables the connection of cost-effective polymer and HCS/PCF fibre technology. The optical transmission of data via fibre optics is free of electromagnetic interference and provides complete electrical isolation on the transmission path. It is therefore particularly suitable for Ethernet applications.

Specifically designed for Profinet systems, the SC-RJ connector enables easy assembly without specialist knowledge. The devices, which are transparent with respect to transmission, have a short delay time (latency) of 60 ns. This is particularly advantageous for time-critical Ethernet protocols. In addition to numerous diagnostic LEDs, the media converters feature the LFPT (link fault pass through) function. This ensures permanent and consistent connection monitoring: If a link is lost, redundancy mechanisms can be activated immediately. Integrated fibre optic diagnostics continuously indicate the receiving power via an LED bar graph. In addition, a broken fibre or the instance when the system reserve is reached can be read via two floating switching outputs.

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

Precision control in joining applications

Digiforce is the trusted name when comprehensive monitoring of press-fit, joining, riveting and caulking processes is needed. The models 9306 and 9310 are being successfully used in innumerable applications as both an individual process control system or as multichannel monitoring equipment.

Now ASSTech offers the new generation of German-manufactured Burster Digiforce process monitor, model 9307 – a high-end universal controller based on powerful hardware and software architecture. Intuitive operation using the clear, graphics-based menu tools, guide users quickly to their objectives. Precision control of joining, riveting and caulking processes or curve-monitoring functions is still one of the core functions, while new options in the field of torque measurement and haptic testing, universal signal testing, leak detection and many other options expand the range of applications enormously.

At a glance, the user gets not just a global result, but also detailed OK/NOK evaluations of the process status. With new graphical evaluation elements such as thresholds, trapeziums, windows, envelopes and additional user-configurable mathematical operations, it is possible to achieve precise monitoring of process curves. A range of informative diagnostic pages enables sophisticated process analysis.

Programmable I/Os, independent measurement start/stop mechanisms and a powerful fieldbus interface via Profinbus or Ethernet-based protocols, enables rapid and reliable implementation.

The Digiforce 9307 achieves an accuracy class of 0,05 for strain gauges and analog process signals. The controller can also record and evaluate two synchronous processes with its intelligent sampling, which can use a combination of variables. Even production processes with a high component variance are handled easily. Up to 128 measurement programs can be selected and conveniently managed. An internal memory provides storage space for a range of measurement curves for reference purposes. In addition to supporting analog sensor interfaces for strain gauges, potentiometers, piezoelectric signals, DC process signals and others, the unit also supports high-resolution incremental systems and absolute encoders with SSI or EnDat 2.2 output signals.

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

Inductive sensors

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Rockwell Automation was one of the frontline exhibitors at this year’s Africa Automation Fair. Nathan Turner, EMEA business director for Integrated Architecture, was out for the event and SA Instrumentation & Control had an opportunity to interview him along with Henry Craukamp, the company’s new MD for South and sub-Saharan Africa, and control systems business manager, Christo Buys. We asked about The Connected Enterprise and Integrated Architecture, and how Rockwell Automation has used these ideas to transform its own operations.

The Connected Enterprise and the Integrated Architecture

The Connected Enterprise is Rockwell Automation’s vision for seamless integration across all divisions of the organisation to enable more efficient decision making through access to the power of information based on real-time data. It is built on the digital technologies of the IIoT and enabled by a platform called Integrated Architecture.

As the demand for connected machines and equipment increases, smart manufacturing is making systems more intricate. Rockwell Automation’s Integrated Architecture helps to reduce the complexity by providing engineers with a platform to manage future capacity and throughput requirements in the evolution towards digitalisation.

“The Connected Enterprise unlocks the useful information in an organisation’s data and delivers it to the relevant decision makers,” explains Turner, “it’s the brains of the operation. Integrated Architecture, on the other hand, is more like the nervous system. It connects all the different sensors and actuators together and then moves the data up from the plant for further processing, either on premise or in the cloud.”

“Data can flow both ways through the network,” adds Buys, “which means any process related commands are passed back down to the plant through the same channel. In this way drives can be connected to controllers, controllers to motion systems, and motion systems to HMs. Devices are connected using standard Ethernet cables and the Ethernet/IP protocol, and it’s a truly integrated system in that it incorporates diagnostic and safety functions as well.”

Rockwell Automation using its own solutions

So practically, how does one take these ideas beyond conceptual idealism and realise measurable operational benefits?

Henry Craukamp joins the discussion:

“As global pressures for goods and natural resources continue to grow, companies need to find new, innovative ways to use advancing Internet-ready technologies to meet demand. The convergence of information technologies (IT) and operational technologies (OT) is improving global production, sustainability efforts and overall business. Rockwell Automation understands the evolving industry challenges confronting global manufacturers – because we are one,” says Craukamp. “As an evolution of our decades-long commitment to capturing enterprise data to make better decisions, Rockwell Automation implemented an enterprise-wide strategy several years ago to better connect our global manufacturing facilities and accelerate the business value of our vision of the Connected Enterprise.”

Today our manufacturing processes are focused on lean manufacturing to better manage quality for our customers. Technologies, including cloud, mobility and big data, are leveraged to continue improving the Rockwell Automation production strategy. Craukamp suggests that organisations develop a five-year plan that reviews its facilities and supplier network entirely. It is also imperative that they take into account individual locations, products produced at each facility, the new technologies needed to
tighten control of their supply chain and work with suppliers to support the new layout. He explains how after executing their plan, Rockwell Automation has seen success in the following areas:

- Plant behaviour: Inventory reduced from 120 to 82 days, and realized 30% savings annually in capital avoidance.
- Supply chain/lead times: The supply chain has seen an increase in on-time delivery from the mid-80s to 96% – and lead times have also been reduced by 50%.
- Customer service and quality: Not only are the company’s operators and engineers experiencing benefits from the MES system, but its customers are, too. On-time-to-want-availability improved from 82 to 98%, and there has also been a 50% reduction in parts per million defects through improved quality.
- Productivity: Better and faster decision making enabled by better information helped deliver 4 to 5% annual productivity.

Craukamp puts it into context: “Real-time access to the state of supplier availability has helped transform us into a leaner organisation far better equipped to cope with volatile market conditions. With live quality reporting, issues in the production chain can be isolated and actioned immediately, not after the fact in a month-end report. For instance, our staff and business partners out in the field are now able to access real-time product-related updates while sitting in front of a customer.”

Walking the Connected Enterprise talk

“It’s not a one-size-fits-all approach,” concludes Craukamp. “The key to operationalising the Connected Enterprise depends on a customer-centric attitude that takes into account the processes, existing plant architecture, operating requirements, capital expenditure constraints and overall business objectives and recommending a solution accordingly.

“Our advisory role then becomes critical in terms of optimising resources through intelligent technological implementations and greater operational connectivity.

“It may not necessarily be about wholesale component upgrades, it might simply be looking at the way the plant is configured and identifying where the utilisation of existing technology is not as efficient as it could be.”

Success stories like this are encouraging because they show that automation vendors like Rockwell Automation not only have a vision of where the industry is headed in the future, but that they themselves are prepared to test and fine tune that vision through operationalising it on themselves.

For more information contact Michelle Junius, Rockwell Automation, +27 11 654 9700, mjunius@ra.rockwell.com, www.rockwellautomation.co.za
SICK Automation’s next-generation laser distance measurement sensor, DL100Hi, achieves higher levels of accuracy over greater distances for positioning and control in fast-moving environments.

This high performance can help achieve cost and operating efficiencies in high-speed automated applications such as warehouse storage and retrieval and in distancing and collision prevention for overhead cranes.

With the DL100Hi, SICK has developed significantly-improved control loop technology to achieve faster and more accurate position feedback. The sensors’ data output supports applications with acceleration values up to 15 m/s². As a result, for example, storage and retrieval systems can become more efficient – achieving shorter run times and more runs per hour.

The new sensor offers the choice of three measuring ranges to suit customer applications (0.15-100 mm, 0.15-200 mm and 0.15-300 mm). It is also the first to utilise a new modular platform for SICK distance sensors, offering users flexibility and easy interchangeability within a common mechanical and electrical design. A wide variety of feedback interfaces are supported including SSI, RS-422, Profinet and industrial Ethernet.

With its IP65-rated compact metal housing, the sensor is reliable and robust. It achieves a MTBF of 100 000 hours – double the lifetime of many standard laser sensors. Operators can therefore reduce downtime and the total cost of ownership.

Maintenance downtime is also minimised through the sensor bracket’s quick-release mechanism and SpeedConT connector technology with a 3D alignment capability that makes fine adjustment easy and cost effective.

“The technology advances achieved with the DL100Hi are the culmination of more than 20 years of development in laser positioning and automation control at SICK,” concludes product specialist, Mark Madeley. “As a result of its improved performance, operators can realise significant improvements in operating efficiency. At the same time, the sensors’ robustness and reliability reduce the risk of downtime and offer longer periods between replacement.”

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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Bosch Rexroth is setting new standards for fast and efficient pressing and joining applications with its innovative new modular Smart Press Kit. Designed to meet future industrial requirements by providing a complete mechatronic package across a wide range of pressing and joining applications, the kit functions according to the Plug and Produce principle, and will be supplied in sub-Saharan Africa through Tectra Automation.

Industry requirements and processes are shifting away from individual products to complete system kits. In the factory of the future, machines, production lines and storage systems will collaborate within a network composed of cyber-physical systems (CPS) that will be capable of autonomously exchanging information, triggering actions and controlling one another. The Smart Press Kit is an innovative solution on the road to Smart Factory. It delivers swift, easy commissioning with automatic configuration.

The modular kit consists of synchronised hardware and software components: electromechanical cylinder and power sensor, servo motor, drive controller, industrial PC and browser-based HMI software. Pre-selected mechanical, electrical and software components are combined in various kits for forces from 2 to 30 kN.

Automatic parameterisation of the servo drive, pre-installed operating software and a minimal number of interfaces, the kit simplifies configuration and commissioning, maximises transparency, reduces downtime and increases productivity, saving up to 95% engineering time. The new software with an intuitive, modern design is Industry 4.0 capable thanks to a connection via OPC-UA, and no programming knowledge is required.

Ideal for applications where simplicity and rapid commissioning are all important criteria, the Smart Press Kit has wide application across industry. It can be used for assembly, joining, forming and testing applications. “The Smart Press Kit can be used as a standalone solution or as an integrated solution,” concludes Tectra Automation product manager Julie van den berg. “It is the perfect addition to complement our offerings across industrial and factory automation applications in sub-Saharan Africa.”

For more information contact Julie van den Berg, Tectra Automation, +27 11 971 9400, julie.vandenberg@tectra.co.za, www.hytecgroup.co.za
Emerson has expanded AMS Device Manager with HART-IP support, making it easier to connect with devices and control systems and potentially eliminate hundreds of thousands of dollars in project hardware and engineering. AMS Device Manager is used by facilities across the globe to streamline installation of field devices during capital projects, increase safety system uptime, and quickly and safely test devices from the control room. By eliminating multiplexers, organisations can more easily use AMS Device Manager to configure, calibrate, validate and document more of their HART-enabled field devices and systems.

Connecting field devices to asset management systems typically requires the use of multiplexers that significantly increase hardware costs and engineering hours during the project phase. According to FieldComm Group, more than 40 million field devices use HART, a protocol designed to allow intelligent devices to communicate with host systems. HART-IP – now native on AMS Device Manager – allows asset management systems to bypass complex and expensive multiplexers and directly access measurement and diagnostics information from HART-enabled field devices using existing plant Ethernet networking infrastructure.

The current interface has been tested for connectivity to Schneider Electric Triconex Tricon CX safety systems, HIMA HImax safety systems, and Phoenix Contact multiplexers. Emerson will continue to test and add new systems to the list of those officially supported by the interface.

“Asset management systems help integrate data between field devices and systems, making them useful for other on-prem or off-prem IIoT software and analytics,” said Mani Janardhanan, vice president of product management for Emerson’s Plantweb and reliability solutions. “With better plant data integration, organisations can take an early, significant step to enable digital transformation.”

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LM sensor for precise applications

Banner’s LM series of precision measurement sensors is now available in an even more precise model that features a 0,002 mm analog resolution at a range of 40-80 mm. The new LM80 model also features a smaller spot size (less than 1 mm at all measurement ranges) to detect even smaller features and take more measurements over the face of the target for more precise profiling.

The sensors provide reliable quality control and repeatable measurement of real-world targets with varying colours and reflectivity. In addition, they feature a thermally stable design that resists temperature changes, as well as enhanced mounting stability, for high accuracy in the toughest environments. The new LM80 has a temperature effect of ± 0,006 mm/°C. This is imperative for high precision applications since even a few degrees of temperature change can cause other sensors’ measurement error to double.

All-in-one device

With IO-Link communication, users can remotely monitor sensor performance, easily identify and analyse trends in inspection results, and predict when maintenance is needed so that problems like a dirty lens can be resolved before sensor failure.

Featuring a fast 0,5 ms response speed and 0,25 ms sampling rate, LM sensors reliably solve high-speed applications with fast-moving targets. They also provide discrete, analog and IO-Link capabilities, which enables flexibility and reduces inventory requirements. LM sensors can be programmed via IO-Link or an optional remote sensor display (RSD). The RSD enables remote setup and monitoring, and it stores up to six configurations to facilitate product changeover and simplify device replacement. It can also remain inline to monitor sensors in difficult-to-reach locations, or it can be removed after configuration.

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

SICK Automation has developed a sensor solution that operates on the basis of deep learning algorithms. Following the AppSpace eco-system that permits realisation of flexible solutions for automation applications, the deep learning sensor solution permits previously unimagined applications and contributes to driving Industry 4.0 forward.

Such deep learning technology is used in the industrial environment to specialise the functionality of sensors. In these applications, the sensor learns to process information and therefore obtains new functions. In addition, new processes are possible on the basis of adapted sensors. The sensor supplies, processes and analyses data using self-learning algorithms.

As an example, sensors are trained with a large number of images to give an answer to a specific question. On the basis of this training, the sensor can independently assign new unknown images to a result. “We are currently working with deep learning on a pilot project in the lumber industry,” explains Grant Joyce, sales and marketing manager, SICK Automation Southern Africa. “The basis of our solution is a camera with deep learning functionality.”

To ensure optimum use of the raw lumber material, sawmills must know about the conditions in the logs, such as knowing where the age rings and the core are in order to ensure good processing of the lumber. “To find out how the lumber can best be used, we taught the camera to identify these using deep learning, a task that could previously be performed only by humans,” adds Joyce.

This technology makes it possible to realise new, previously inconceivable applications that make processes more efficient and more productive. In the pilot project, SICK was able to increase material use, improve the quality of products and avoid unnecessary resource wastage. Additionally, sustainable use is possible not only with materials, but employees too as they no longer have to perform monotonous activities, freeing them up for more complex tasks.

“These developments in sensor technology provide the flexibility for production locations to adapt to individual tasks,” concludes Joyce.

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Johnson Controls introduces Verasys

Johnson Controls recently introduced Verasys, a plug-and-play controls system that integrates heating, ventilation, air-conditioning and refrigeration (HVACR) equipment and controls. Verasys offers customers a flexible, one-source procurement solution with advanced technology already embedded for the self-discovery of smart equipment. Suitable for single or multi-zone applications, the new controls system seamlessly connects to a vast range of smart-enabled mechanical and electrical equipment, controls and sensors using wireless configurations that result in cost savings.

“The system provides the required capabilities and secure data to deliver end-to-end control technology to building owners and as a result, customers can take advantage of a new level of insight into building operations and provide facilities that better serve occupants,” says Mark Redgard, operations manager at Johnson Controls in South Africa. Verasys will be launched in South Africa during the third quarter of 2019.

Complete solutions

Configurable controllers provide simple settings for implementation. However, contractors have the option to change defaults to meet their unique requirements. The system also empowers them to offer a complete bundled solution of smart equipment and controls that work with third-party, package equipment for greater application, flexibility and protection of existing investments. Since the system communicates using BACnet MSTP, it integrates with Metasys or any third-party BACnet system. Contractors will also appreciate new opportunities to service equipment, thanks to optional fault detection and diagnostics that immediately deliver alarm notifications via email or text.

For building operators Verasys provides unprecedented, remote access anytime, anywhere, over a secure Internet connection using PCs, smartphones and tablets. The controls system connects users to data streams from smart controls in rooftop units, fan coils, zone dampers, heat pumps, refrigeration systems and lighting panels and more. With real-time data, managers can identify and troubleshoot issues remotely and take advantage of insightful solutions that deliver the quality and value their facilities require.

For more information contact Johnson Controls, +27 11 921 7100, mark.redgard@jci.com, www.johnsoncontrols.com
I/O solutions with Profinet redundancy

Turck’s Simple IO-Link Device Integration, SIDI for short, simplifies the handling of IO-Link. As its first fieldbus module with Profinet S2 system redundancy, the company has introduced the TBEN-L5-8IOL. This IO-Link master with IP67 protection supports the Profinet redundancy concept relevant for process automation. Through the upgrade, the block I/O module is able to establish, via a single connection, communication relations to two controllers – the primary controller and its backup. In this way, the master module integrates the host of existing IO-Link devices, such as position indicators, valve blocks, I/O hubs and sensors, in the world of high availability systems.

The device was provided with the additional function immediately after the first Profinet system redundancy certification was published. Over the course of the year, Turck will upgrade other multiprotocol devices such as the IP67 block I/O modules of the TBEN series, as well as the I/O systems for the control cabinet of the FEN20, BL20 and excom series. Profinet S2 system redundancy will thus soon become standard in Turck’s entire fieldbus portfolio.

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

Easy startup at the turn of a wheel.

The Radioline wireless system

Radioline is the wireless system for large systems. Special features include extremely easy assignment of inputs and outputs by simply turning the thumbwheel – without any programming.

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The increased move towards the use of IE3 electric motors has made it increasingly important that the most appropriate starting method be selected to ensure optimum performance. With this move it is essential that the motor switching and protection components are engineered to meet the demands of the IE3 motor.

Generally, the most basic starting method for an electric motor would be a direct online or star delta starter. However, older generation switchgear has not been engineered for IE3 motor compatibility and may generate nuisance tripping. Not only is this undesirable, it can also have a severe knock-on effect in terms of operational productivity and efficiencies.

WEG IE3 compliant low voltage switchgear has been engineered to offer absolute reliability when using devices to start and operate WEG IE3 motors. Users can be confident that when using compliant switchgear, their drive system will provide the highest levels of energy efficiency over a long service life. This will, in turn, translate into a reduction in the total cost of ownership while complying with current environmental regulations.

Motor protective circuit breakers
Typically, motor protective circuit breakers are affected most when starting electric motors because of sensitivities to transients and instantaneous values of current.

WEG circuit breakers were evaluated specifically in terms of this and the multiple of short circuit release was changed from 12 to 13 times the rms value of the rated current. Following this modification, extensive testing was conducted to verify that, with these modifications, the whole range of circuit breakers is IE3 compliant.

Contactors
The entire range of contactors is IE3 compliant. The application of sound engineering principles ensured that there is no mechanical or electrical lifespan reduction, or an increase in the contactor’s coil consumption.

Overload relays
Overload relays are designed to protect motors thermally against overload conditions and unlike motor protective circuit breakers these are not sensitive to instantaneous currents. WEG solid-state and thermal overload relays conform to IE3 motor application.

Significantly, as a leading manufacturer of premium (IE3) and super-premium (IE4) electric motors, the company has developed extensive expertise in IE3 equipment conformity and all its current switchgear and protection devices can be used without restriction to ensure the reliable operation of IE3 motors.

New products and support
Zest WEG Group’s technical team is able to assist customers in the appropriate selection of IE3 compliant control and protection components to optimise the efficiency of motor installations.

New products are continually being added to the low voltage switchgear range, leveraging off the ongoing research and development conducted by WEG Brazil. These products are available off the shelf and include contactors, motor protection relays, motor circuit protection breakers, push buttons and indicating lights, field isolator stations, motor starters in either polycarbonate or sheet metal enclosures and other associated products.

Backed by SABS certification, this switchgear product range is gaining popularity in the mining, general industry, commercial and domestic sectors. Among the leading products are the CSW range of push buttons and pilot lights, now available in complete sets; contactors and thermal overload relays; direct online starters; a full range of miniature circuit breakers and the most intelligent product in the range – the innovative SRW01 smart relay for protecting motors of high value and preventing extended downtime. This low voltage electric motor management system incorporates state-of-the-art technology and network communication capabilities, and its modular concept makes it suitable for a variety of applications.

A full catalogue of switchgear products is accessible online at www.zestweg.com. These products are sold out of a sales centre at the company’s Linbro Business Park facility in Sandton, easily accessible from Johannesburg, Pretoria and Krugersdorp.

For more information contact Zest WEG Group, +27 11 723 6000, info@zestweg.com, www.zestweg.com
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For over a century, the citizens of Barcelona have relied on the metro to travel into and around the city. At peak times, 150 trains shuttle passengers between 158 stations on the eight-line network, which connects central Barcelona with seven surrounding municipalities.

Similar to many public transport systems around the world, the Barcelona Metro network operates in an environment of continually rising demand. In 2018, there were 407.5 million passenger journeys on the system, an increase of 17.1 million (4.4%) from the previous year. Overall demand for public transport in and around Barcelona has already exceeded the levels it was predicted to reach in 2020.

For operators, such as Transports Metropolitans de Barcelona (TMB), this growth creates pressure to continually improve the reliability and availability of vehicle services, whilst keeping costs under control. TMB has always been happy to pursue innovative solutions in order to achieve these goals: three lines of the network already operate using fully automated trains and TMB also has an on-going ambitious digital train project.

The latest innovation that will shortly be introduced on the network is a new approach designed to improve passenger comfort, as well as helping the operator infrastructure to be better managed for maintenance and track renewal activities. Wear and tear takes its toll on any heavily used rail network. Worn rails or worn wheels lead to bumpy journeys for passengers in the short term, and eventually they require repair or replacement.

In the past, the Barcelona Metro has relied on a combination of manual inspection and scheduled maintenance to keep its tracks in good condition. That approach is long-established, but quite costly. Inspection can only take place when trains aren’t running, and maintenance actions require rolling stock to be taken out of service, or lines to be closed for extended periods.

**Multilog IMx-Rail condition monitoring technology**

At the end of 2018, Barcelona Metro started to trial a different approach. It has equipped one of its standard commercial trains with Multilog IMx-Rail condition monitoring technology from SKF. The new system is a self-contained package of sensors and electronics to process and communicate data in commercial operation.

This system is mounted onto one of the train’s bogies, under a carriage. In everyday operation, the unit measures and records acceleration and vibration signals, it then processes this data and transmits all the information wirelessly to a back office collection point, where reported information can trigger required actions.

Next, a dedicated software system, also provided by SKF, uses smart algorithms to analyse the sensor’s data, along with information on the train’s location and operating conditions. The software system, called @ptitude Observer, identifies, locates and accurately records rail track abnormalities that might generate wear or damage to the train’s wheels, passenger discomfort, or noise on particular parts of the track. Metro maintenance staff can then use that information to trigger a more detailed inspection of the area of track identified.

“We are always looking for better ways to deliver a safe, reliable and cost-effective network,” says Fernando Vaquero, rolling stock engineer at TMB. “Technologies such as Multilog IMx-Rail will help us to identify issues more quickly, and to target our inspection and maintenance activities more effectively.”

Multilog IMx-Rail doesn’t only help operators understand the condition of wheels and track. The system is also designed to identify vibrations caused by other problems on the train, such as faulty bearings. Other operators around the world are already using this approach to avoid breakdowns and optimise their rolling stock maintenance schedules. Sensors on the trains measure the condition of wheel and track interaction in real-time, spotting problems faster and allowing metro operators to optimise track maintenance planning and execution.

**For more information contact Samantha Joubert, SKF South Africa, +27 11 821 3500, samantha.joubert@skf.com, www.skf.com**
In response to industry demand for increased quality in food and beverages at every level, Emerson has introduced the Rosemount CT4215 food and beverage leak detection system. The CT4215 is a quantum cascade laser/tunable diode laser (QCL/TDL) continuous, inline detection system designed to help assure quality and safety, maximise production volume and decrease product waste for food and beverage products. It tests the seal and integrity of every bottle or package on a production line, detecting leaks at a sensitivity as low as 0.3 mm and automatically rejecting any defective bottle or package without slowing down production. This is in contrast to the traditional practice of testing occasional grab samples, which can leave a manufacturer vulnerable to low quality, unsafe food or beverages, reduced profitability and damaged reputation.

“In an industry being driven by an increasing consumer awareness of freshness and safety, manufacturers need solutions that allow them to ensure quality while maintaining, or even increasing, efficiency,” said Peter Watmough, global leak detection product manager, Emerson Automation Solutions. “The Rosemount CT4215 provides packagers with an easy to install and use assurance of freshness and safety. For the first time, food and beverage packagers can measure every package and bottle for leaks, without having to compromise their production speed.”

The system installs directly on the food or beverage production line in a compact, self-contained unit. A wide variety of customisable sampling heads are available for any package type, including trays, pouches, bags, bottles and boxes. The patented QCL laser technology measures CO₂ and other gases used in food and beverage packaging. A high-flow vacuum pump draws air from around the package or bottle and delivers this air to the measurement cell. If gas from a leaking product passes through the measurement cell, it will absorb some of the laser light. Less laser light reaching the detector means there is a leak. Any leak detected will trigger rejection of the package or bottle. The system requires few consumables, is low-cost to operate, and needs only regularly scheduled maintenance. It is easily installed on both new and existing production lines.

For the first time, food and beverage packagers can assure that every package leaving their facility is of the highest quality and can eliminate the returns and penalties associated with defects, while enabling any production issues to be identified and resolved within minutes.

“The Rosemount CT4215 quickly brings a food or beverage packaging facility up to current consumer and supermarket quality demands.”

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

Vibration and temperature are the most common parameters measured on process plants for machine maintenance. Temperature measurement has been around for longer, probably because it was available first and was better understood than vibration analysis. However, vibration analysis gives an earlier warning and can provide more information to assist maintenance engineers in decision making.

Most people are familiar with vibration – a vibrating object oscillates. We experience many examples of vibration in daily life. A pendulum set in motion vibrates. A plucked guitar string vibrates. Vehicles driven on rough terrain vibrate, and geological activity can cause massive vibrations in the form of tremors and earthquakes. There are various ways we can tell that something is vibrating. We can touch a vibrating object and feel the vibration. We may also see the back-and-forth movement of a vibrating object. Sometimes vibration creates sounds that we can hear, or heat that we can sense.

Vibration analysis
Vibration analysis can be useful in helping to determine the exact nature of a machine problem, allowing the necessary spare parts for repair to be ordered well in advance of the scheduled shutdown. The cost of equipment failure is tremendous, so is the lost production due to shutdown, particularly unscheduled shutdown. Also, equipment not running efficiently costs money in extra services like electricity and consumables.

So, the answer is to keep a check on the mechanical health of the machine and keep it in operation as long as possible, and as efficiently as possible. The way to do this is via simple fixed and portable vibration monitoring. Unexpected down-time can create a lot of problems and having good information or early warning as to the condition of the machine, a sound judgment can be made as to whether or not to keep the machine running until a more convenient time.

With today’s technology, vibration measurement has become more cost effective and easier to install. User friendly equipment allows simple 2-wire installations that can provide system alarms and also provide data to analysers for exact fault diagnosis. More sophisticated systems can be installed on critical rotating plant to provide on-line, real-time analysis. These systems can also be linked to existing vibration sensors and when made available on an LAN of your choice can be viewed at any point on the plant or even around the country. By making vibration information available plant or country wide it allows the correct people to make the right decision and results in savings on downtime due to unnecessary maintenance and undetected failures.

Historically, many processes have been shut down on a routine basis for visual inspection of the machinery, whether or not an inspection was required. Shutdowns, even scheduled shutdowns, have become more and more expensive in today’s continuous processes. By installing vibration monitoring equipment or using portable units on a routine basis we can extend the running time between shutdowns.

R&C Instrumentation supplies and supports the RC range of vibration measurement products. These instruments are manufactured in Europe and conform to European standards as far as manufacture, quality and reliability is concerned. Apart from the standard range of RC vibration sensors, ATEX certified intrinsically safe units are also available, as well as a sensor with 4-20 mA vibration and 10 mV/°C temperature output. Portable instruments, raw data converters, and programmable vibration switches complete the range of RC products.

For more information contact R&C Instrumentation, +27 71 471 2056, info@randci.co.za, www.randci.co.za
Monitran has introduced the General Purpose Monitoring Sensor range, for use with PLCs and other industrial controllers, which provide users with a continuous output of vibration, usually as a 4-20 mA signal. Changes in the monitored signal allow users to spot vibration changes in the part of the machine to which the sensor is attached. Rapid changes accompany such conditions as machinery working loose from its mountings, fan blade malfunction, or bearing failure, all of which require immediate attention and machine shutdown to avoid widespread damage. If the signal is logged at regular intervals, gradually increasing vibration indicates wear in the machine calling for replacement or a detailed study with a vibration analyser.

This type of information is required in a wide range of environments, so while the basic output is common to all sensors in this category, there are many variations allowing them to be used in those different environments, including:

- Standard industrial conditions.
- Submersible and long term wet operation.
- Approved under ATEX, IECEx and ANZEx for use in hazardous areas.

The long standing 1185/C series is tried and trusted. It is a general purpose, top-entry velocity transducer with DC output, made from robust stainless steel throughout for continuous vibration monitoring in harsh environments. The unit is sealed to IP67 with industry standard two-wire 4-20 mA output proportional to sensor range that can connect directly to PLC, DCS and other industrial controllers.

The 1185I/C model is ATEX and IECEx Group I & II certified. It has all of the 1185’s components with integral stainless overbraided ETFE cable and is available with a wide range of mountings.

The 1185 W model is a submersible for harsh underwater environments and areas with constant moisture or condensation. It includes integral heavy duty polyurethane cable and is sealed to IP68 and available with a wide range of mountings. The 1185IW is ATEX and IECEx Group I & II certified.

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

A comprehensive range of electronic monitoring and timing devices in different formats for ease of use and retrofit purposes is available from ElectroMechanica (EM). The ElectroDev units are suited to all industrial applications where parameter monitoring is essential for the wellbeing of plant and machinery.

The timing devices, on the other hand, are machine devices to facilitate easy timing and control functions, according to EM product manager Jaap Grobler. He adds that ElectroDev is a key supplier, and has enjoyed a two-decade-long business relationship with EM to date.

“The most popular products in the ElectroDev line-up are its voltage and phase monitoring devices to protect plant and machinery,” highlights Grobler. “Of course, the timing devices are very popular as well due to their versatility and simplistic programming methods. In addition, all products and applications are supported by EM’s countrywide network of offices and sales and technical personnel.”

The success of the ElectroDev product range is attributable to the combination of EM’s large stockholding to meet all requirements, and the quality of the products themselves. Another key factor is the extensive range. As an example, products are available in a DIN rail mounting format, with or without display, as well as in 11-pin plug mount format.

“ElectroDev fits in perfectly with our complementary products needed to complete plant and machine installations,” concludes Grobler. “A number of exciting new launches are on the cards pending an official announcement from EM.”

For more information contact Karen Zotter, ElectroMechanica, +27 11 249 5000, karenz@em.co.za, www.em.co.za
OFS, a leading designer, manufacturer and supplier of innovative fibre optic network products, has announced the launch of its new LC Crimp and Cleave connectivity solution for industrial networks. The LC Crimp and Cleave connector takes advantage of the advanced optical and mechanical properties of HCS (hard clad silica) and Graded Index HCS optical fibres, attaching to the cable through mechanical means rather than traditional epoxy/polish methods.

Fast (100 Mb/sec) and Gigabit Ethernet (1000 Mb/sec) data rates in industrial networks demand higher bandwidth and real-time, low-latency communications. The increasing use of intelligent electronic devices, utility-grade rugged Internet Protocol (IP) routers, and Ethernet switches is driving IP-based communications on the production floor and new demands in factory automation and industrial networking applications.

A high bandwidth, rugged, and reliable cabling solution is indispensable for the growing demand in industrial networking applications as data rates in industrial settings grow. OFS' GiHCS optical fibre in a low smoke zero halogen (LSZH) cable construction with easy-to-use Crimp and Cleave LC connectors allow technicians an easy connector installation for harsh environments.

“What was historically a 10 minute process for installing fibre optic terminations is now made simpler and easier with OFS’ new Crimp and Cleave technology,” said Mike Hines, marketing manager for industrial and energy markets at OFS. “Designed with the field installer in mind, technicians with minimal fibre optic experience can rapidly install new, or repair damaged, fibre optic cables with OFS’ Crimp, Cleave and Leave LC technology.”

Advantages of this new GiHCS industrial cabling solution include:

• Wide GiHCS cable operating temperature range: -20 to 80°C.
• Resistance to abrasion, vibration and industrial chemicals.
• Indoor and outdoor use.
• High tensile strength.
• Fast (100 Mb/sec) and Gigabit (1000 Mb/sec) Ethernet compatible.
• Compatibility with most common small format pluggable (SFP) transceivers.
• Fibre optic specialists are not required.
• No power, no epoxy, no gel, no polishing required for termination process.
• Minutes to learn, seconds to connect.

For more information contact
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reghardt@kvmtech.co.za,
www.kvmtech.co.za
SOLUTIONS FOR ANY REQUIREMENT

KVM Solutions

KVMTech is a leading supplier of digital and analogue KVM equipment used in control rooms for industrial process control, in air traffic control, broadcast studios and on ships.

With a broad portfolio of powerful devices to extend, switch and distribute keyboard, video and mouse signals and many years of experience in equipping control rooms, users can benefit from KVMTech’s solutions and their real added value.

Eurotherm Solutions

KVMTech is the agent for Eurotherm Industrial Automation and process control, measurement and data management solutions and services. Our innovative products and solutions are designed to bring real benefits to customers by optimising processes, operations and plant efficiency.

Our wide range of products is rich in features and designed for easy operation and reduced engineering time. They contain market-leading control algorithms, recording and data management strategies which add value to industrial processes, improving quality, reducing waste and ensuring data is kept safe for as long as it is needed.

GiHCS® - The Optical Cable and Connection Solution for Industrial Networks

Easily install LC, ST, SC connections onto high-strength 62.5 µm GiHCS optical fiber integrated into Industrial Cable constructions. Applications include Industrial Ethernet, Industrial Controls, Factory Automation, Robotics, Plant Engineering (IoT) - One Simple System. Once you try it, you’ll ask yourself “Why haven’t I used this solution sooner?”

Install connectors directly onto application specific, heavy-duty industrial cable. High-strength GiHCS Fiber is more robust than traditional fibers. No epoxy, no polish-installs in minutes on site. Full training on use in less than 10 minutes. Easily integratable into new or existing networks.

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ENCLOSURES, CABLES & ACCESSORIES

No weak links
EKD Kolibri energy chain from Powermite.

EKD energy chain from Powermite delivers reliable and cost-effective protection of cable, hose and hydraulic supply at a fixed or variable speed for the seamless operation of mobile equipment such as cranes and milling and boring machines.

“Our combined knowledge of over 50 years in drag chain applications with the globally renowned German energy chain manufacturer EKD, positions us as a leading supplier of EKD Kolibri energy chain to southern African industry,” says Donovan Marks, director at Powermite. “EKD Kolibri energy chain is uniquely engineered to reduce operational costs and extended component life for lowest total cost of ownership. It therefore comes as no surprise that this high quality product which we have been supplying to the southern African market for over three decades, is widely used across diverse industries such as ports and harbours, materials handling, industrial and water treatment plants.”

According to Marks, one of the biggest challenges when it comes to recommending the most optimum energy chain solution, is that customers are not always able to provide the most accurate or comprehensive information about their machines. “We interact regularly with our customers and build solid long-term relationships so that we get to know their business and completely understand their equipment and requirements in order to be able to recommend the best possible solution.”

Powermite’s comprehensive range of EKD Kolibri energy chain, available in galvanised steel, stainless steel and carburised (hardened) steel, includes different types – a one part link or flap-open link range, a wide range of bending radii (to facilitate large cables), as well as chain with separate end-connectors (each link can be used as an end-connector). “The bars of the flap-open range ensure easy access for on-site installation of hoses or cables,” explains Marks.

The EKD Kolibri series ranges from external sizes of 15x15 mm through to 65x225 mm while the EKD PKK range can handle external sizes up to 100x340 mm. Steel external sizes start from 50 mm high x up to 1500 mm wide.

The company’s energy chain portfolio also extends to a plastic range consisting of self-extinguishing, ATEX, anti-static, steel-coated and robotic bi-directional chain. Very few spare parts are required as all plastic chains are equipped with integrated connectors, keeping costs and downtime to a minimum. Powermite also offers chains designed for ultra-long distances. Known as the Marathon System, these chains use roller sets and are capable of maintaining speeds of up to 200 m/minute.

EKD Kolibri energy chain’s wear resistance ensures exceptional reliability. This robust chain requires minimal maintenance and spares and can operate in extreme temperatures between -20 and 100°C.

Powermite’s countrywide branch and distribution network in Johannesburg, Witbank, Cape Town, Durban, Richards Bay and Rustenburg, carry a full range of spares for the entire EKD Kolibri drag chain range and deliver after-sales service support to customers and end-users across some 15 African countries as well as in Mauritius. Powermite’s extensive product portfolio includes a comprehensive range of industrial and mining cables, industrial and mining plugs and sockets, cable reeling equipment and accessories as well as energy supply systems. Powermite is a division of Hudaco and ISO 9001:2000 certified.

For more information contact Donovan Marks, Powermite, +27 11 271 0000, donovan@powermite.co.za, www.powermite.co.za
HELUKABEL® is a leading international manufacturer and supplier of cables and wires. Our specially designed cables have stood the test of time in installations all over the world.

HELUKABEL® offer cables and wires but also offer a vast array of cable accessories:

- Cables glands protective tubes
- Drag and guidance chains
- Bundling, binding and fixing
- Termination and connection sleeves
- Identification and marking
- Terminals and lugs
- Insulation, shrinks, braided and high temperature termination and connection sleeves
- Tools
- Connectors
Universal enclosure system for electrical explosion protection

For many years, users have been waiting for a new, universal enclosure system in the field of electrical explosion protection. Having invested in this area, Pepperl+Fuchs has developed the GRP enclosure series with its wide variety of relevant features. The design concept is the result of extensive experience in explosion protection and brings together a high degree of flexibility, for wide range of applications with little planning required.

The sophisticated mounting grid demonstrates the tremendous flexibility of the system and its high level of practical relevance. With this design, terminals and control elements can be planned and implemented according to customer-specific requirements and any DIN rails can be easily mounted using self-tapping screws, without the need for time-consuming engineering. An innovative spacer system enables the use of different components at different heights within an enclosure. In addition, this system increases flexibility during the planning process and allows significantly more functions to be combined in a single box.

Flexible planning, efficient handling
The boxes themselves are offered in a range of enclosure sizes and depths, which, when combined with the new spacers, guarantees virtually unlimited flexibility in the planning process and the optimum use of space.

Perhaps an unusually high number of cable glands has been specified? No problem, this is simple to implement with minimum effort. Is an extra row of terminals required in addition to the operating elements? Just like that, the required result can be achieved quickly and efficiently without mounting plates. And likewise, when planning straightforward terminal boxes the new flexibility offers far more possibilities for customised tailoring. If the customer wants the DIN rail to be mounted slightly higher because cables need to run below it, this can be achieved quickly and efficiently with the new enclosure series.

However, what truly makes the GRP enclosure is its many useful and innovative features. The sealing concept for IP66 impresses not just with a captive formed-in-place silicone foam seal, but the concept also features a new protective upstand that prevents mechanical damage to the sealing edge and is completely unique on the market. Using this sealing concept, it is even possible to stack the boxes with the lid open with the sealing edge well protected during installation or when adding extensions. A further innovation with significant benefits for process automation, the new GR box can be used at a temperature of -60°C. The customer therefore has a low-cost alternative to stainless steel, in many cases even under difficult environmental conditions.

The new solution also offers significantly reduced effort required for installation. Due to the intelligent design, it now takes just one person to fit even larger and heavier boxes. First, two screws are drilled into the wall and used to hold the enclosure in place. The remaining screws are then inserted, and everything is tightened at the end. This process saves time, therefore considerably reducing costs during installation and maintenance. Another feature the service team may find practical are the especially sturdy hinges that allow easy opening of the lid. The hinges are fastened with screws that do not pierce through the enclosure. This approach is taken for nameplates too. And one more thought put in for practitioners: leverage points for screwdrivers enable easy opening of the lid, thus saving time and ensuring easy handling during maintenance.

Quick availability
For plant engineers and machine builders, what counts in an enclosure solution is not only that it is tailored to their needs, but how quickly the product is available to them. For this reason, Pepperl+Fuchs supplies enclosures that are precisely tailored to user requirements almost as quickly as if the products were available off the shelf.

Terminal boxes and control stations are the first products available with the new GR-enclosure series. Later, the enclosures will become available for remote I/O and fieldbus applications. In addition, an engineering team, specialists in electrical installation and hazardous area protection, stand by to plan tailor-made solutions. During planning, engineering and production, the priority is always the requirements of the enclosure and the shortest possible delivery time.

For more information contact Pepperl+Fuchs, +27 87 985 0797, info@za.pepperl-fuchs.com, www.pepperl-fuchs.co.za
Schneider Electric has announced the introduction of integrated earth leakage protection for its Compact NSX and NSXm moulded circuit breaker ranges.

“The award-winning Compact NSX moulded case circuit breaker range and the new, smaller Compact NSXm range, now both feature integrated earth leakage protection, Micrologic Vigi,” explains Maphuti Levy Moholola, offer manager at Schneider Electric South Africa. “This is a technology that monitors the flow of current and sends pre-alarms in the event of earth leakage, interrupting the circuit instantly, should it detect any disruptions, effectively preventing the danger of electric shocks.

“This innovation means that during the process of installing circuit breakers, panel builders and contractors are no longer required to install an additional earth leakage module, which can lead to savings of up to 40% in installation time. Because the ranges have integrated earth leakage protection, the same frame size as a standard breaker, they are designed to fit in the same row.”

EcoStruxure Power connectivity

The ranges are part of the Connected Products portfolio of the Schneider Electric IoT-enabled architecture, EcoStruxure Power, an open, interoperable system architecture and platform, delivers enhanced value around safety, reliability, efficiency, sustainability and connectivity.

“Designed with high-breaking capacities for all standard and specific applications, and with an operating current up to 630 A, the Compact NSX circuit breaker range features integrated earth leakage protection, and offers local and remote communication with trip alarm and pre-alarms for proactive operational and energy efficiency,” explains Moholola. “The range provides corrective, preventative and predictive maintenance and energy management to enable potential savings, and ensure customer installations can be optimised, in terms of performance and protection.

“As the newcomer for applications up to 160 A, the Compact NSXm range is designed for low-voltage panel boards and control panels. As the smallest frame size in the Compact NSX range, and similarly featuring integrated earth leakage protection, it is an ideal space-saving solution for installations.

“This efficient solution offers a flexible installation thanks to a built-in DIN rail and plate mount capability, while field-installable options such as rotary handles and one-click auxiliaries make it easy to configure the circuit breaker to the user’s specific needs. The Compact NSXm range also features EverLink creep-compensating technology. This ensures a lasting connection by mitigating the loosening effects of heat cycling or vibration.”

Reliability that fits and efficiency that clicks

Today, there is more pressure than ever on panel builders and contractors to come up with time and cost-saving solutions through efficient mounting, installation and cabling of switchboards for their customers.

“As a leader in the digital transformation of energy management and automation, we recognise that our partners demand innovations that offer efficiency, reliability and connectivity,” concludes Moholola. “We are responding to this need with integrated earth leakage protection technology, all of which means that Compact NSX and NSXm circuit breakers are easier than ever to install, which in some cases, can help to make installation time up to 40% faster.”

For more information contact Prisca Mashanda, Schneider Electric SA,
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ELECTRICAL POWER & EFFICIENCY
Batteries in motive power applications

When discussing motive power applications, the initial thought is that their batteries must be similar to transportation batteries. After all, this equipment is ‘motive’ just like a car or truck. However, this is not the case. Motive power applications, such as forklifts, electric golf carts and electric lawn mowers, use batteries more closely related to stationary than transportation batteries.

How these batteries are stationary
How are these batteries different than those in motor vehicles? Transportation batteries function as start/stop batteries. The primary discharge occurs when the vehicle is started. After that, it spends the rest of the drive time recharging.

Motive power batteries, on the other hand, do not operate in this fashion. Instead of only being used to start the machinery, there is a continual discharge. These batteries are used constantly while in operation. This is similar to other stationary batteries in that they are used until depleted, or until the job is done, and then recharged after use.

Why stationary batteries are used
Stationary batteries are used in these applications because of their nature. They tend to be ‘dirtier’ with a higher output threshold. It is imperative that they have low downtime and increased, continual productivity. Transportation batteries simply cannot keep up with these needs.

Industrial machinery is used for a variety of day-to-day plant operations and batteries are among the reasons for underperformance. This is why testing and maintenance is vitally important. If neglected, it can contribute to higher repair and replacement costs, a significant decrease in the machine’s lifespan, and even safety risks.

Midtronics’ electrical system testing technology is used by six major automotive manufacturing facilities in South Africa in on-vehicle equipment, recording events that may lead to battery or electrical system failure. In addition to this, two leading South African battery manufacturers and distributors have committed to using the technology in their facilities and distribution outlets.

Midtronics is entirely focused on the development and marketing of technology products for manufacturers, distributors and users of lead-acid batteries and continues its aggressive research and development of products for alternative chemistry batteries.

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

Better transformer design improves safety

As electricity utilities and users worldwide look to become more safety conscious and efficient in their use of electrical energy, it is important to leverage the improvements that have been made in the design of transformers.

According to Trafo Power Solutions managing director, David Claassen, there have been considerable strides in technology, surpassing both the efficiency and the reliability of the traditional oil-filled transformers that are predominantly used in power grid systems.

These high efficiency solutions include open-wound transformers (OWTs), vacuum-pressure impregnated transformers (VPis) and cast resin transformers (CRTs). Traditional oil-filled transformers use paper saturated in oil wrapped around the winding material as an insulation medium. If not maintained correctly, insulation degradation will occur, with the oil posing both a safety and environmental risk.

“OWTs are constructed by dipping preheated windings into a high temperature varnish bath and then baking them,” says Claassen. “This replaces the need for oil and paper, so only a small amount of material is flammable.”

In VPi construction, layers of polyester resin are applied to the windings, which are subjected to interchanging cycles of pressure and vacuum that ensures deeper penetration and reduces the chances of air voids.

“With CRTs, windings are placed in a mould which is filled under vacuum with resin epoxy,” says Claassen. “Fibreglass mesh is used to strengthen the windings, which are cured in a heat-controlled oven. This process also prevents air voids, and the resin in CRTs is non-flammable.”

These designs have also made advances in reduced electrical losses, thereby improving efficiency. The use of OWTs, VPis and CRTs offer considerable savings in energy costs over their life-spans, which for CRTs averages about 20 years. Despite the slightly higher capital cost (around 20%), these technologies can repay the price differential in just four years.

Claassen concludes that low loss cast resin transformers are being used in many parts of the world including Europe and North America because, although there is an initial premium, the payback period is between two and four years. These are now available for the African market from Trafo Power Solutions.

For more information contact David Claassen, Trafo Power Solutions, +27 11 325 4007, david@trafo.co.za, www.trafo.co.za
Stakeless ground loop tester

Testing the grounding components of equipment in hard to reach spaces, including areas that are indoors or fully paved and do not permit driving auxiliary test stakes, is always challenging. Comtest is offering the Fluke 1630-2 FC Stakeless Earth Ground Clamp, a high quality, heavy duty clamp jaw that stays in alignment and in calibration even in industrial environments. It can also identify ground loop resistance without the need to disconnect then reconnect the earth electrode from the system.

Stakeless measurement
The 1630-2 FC clamp measures earth ground loop resistances for multi-grounded systems using the dual clamp jaw. This test technique eliminates the dangerous and time-consuming activity of disconnecting parallel grounds, as well as the process of finding suitable locations for auxiliary test stakes. Users can also perform ground tests in places that were previously difficult: inside buildings, on power pylons or anywhere there is no access to soil to place auxiliary test stakes.

Fluke Connect wireless system
The 1630-2 FC supports the Fluke Connect Wireless System. Fluke Connect wirelessly connects the clamp to an app on a smartphone or tablet. The app shows the ground resistance measurements on the smartphone or tablet display. These measurements, as well as the GPS location from the phone, and the images, can be saved to Fluke Connect Cloud storage and shared with the project team.

The Fluke 1630-2 FC has the following features:
- Earth ground AC leakage current measurement: It identifies AC leakage currents without disconnecting the earth ground stake from the grounding system – this is ideal for system troubleshooting.
- Rugged: The heavy duty clamp jaw stays in alignment and in calibration even in every day, on the job industrial environments.
- Logging measurements: The earth ground clamp saves time by automatically recording data at preset intervals and saves up to 32,760 measurements in memory at the set logging interval. It saves time by recording and storing measured values.
- Alarm threshold: It has user-defined high and low alarm limits for rapid measurement evaluation.
- Band-pass filter: The selectable band-pass filter function removes unwanted noise from the AC leakage current measurement.

For more information contact Comtest,
+27 10 595 1821, sales@comtest.co.za,
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RELIABLE PRODUCTS & SOLUTIONS
for the entire industry.

Zest WEG Group is able to offer a range of standard off-the-shelf products as well as end-to-end energy solutions by leveraging best practice engineering and manufacturing capabilities.

All products are engineered to facilitate a safe and reliable environment with operational stability and the highest possible production levels as an objective. Reduced maintenance and ease of serviceability assist in lowering the total cost of ownership.
RS Components has introduced the latest version of the MakerBot 3D printer – the MakerBot Method – which has been designed to bridge the gap between industrial and desktop 3D printing. The unit targets engineers and designers who use 3D modelling software and need to create product prototypes rapidly for a range of purposes, such as to accelerate product development or to ensure the viability of parts before moving to volume production.

A key feature of the Method is its fast printing speed, which is up to two times faster than other popular desktop 3D printers, based on a range of tests using the same layer height and in-fill density settings. Use of the printer can save days or potentially weeks compared to the time taken to outsource prototyping via other additive manufacturing methods or CNC machining, for example.

Another major advantage is the unit’s industrial reliability and precision: for example, the Method has a circulating heated chamber, which controls the heat of each layer and delivers a dimensional accuracy of 0.2 mm, as well as improved layer adhesion and greater part strength. The unit also has a structurally optimised ultra-rigid metal frame that runs the full length of the body, which leads to more consistent prints with better part accuracy and fewer failures, as well as offsetting flexing or warping of printed objects.

The Method also comes with dual high-performance extruders, which offer lengthened thermal cores and optimised torque to maximise the material flow rate at high speeds. In addition, it has an industry-leading suite of sensors with a network of 21 intelligent devices embedded throughout to deliver enhanced control over the printing process.

Other specifications include: layer resolution from 400 down to 20 microns; maximum build volumes of 19 x 19 x 19.6 cm for single and 15.2 x 19 x 19.6 cm for dual-extrusion processes; and connectivity options including WiFi, Ethernet or USB drive. The printer is compatible with a range of leading CAD software packages including SolidWorks, Autodesk, CATIA, Rhino and TinkerCAD.

For more information contact RS Components SA, +27 11 691 9300, sales.za@rs-components.com, www.rsonline.co.za

Fluke’s new PTi 120 pocket thermal imager for easy troubleshooting and industrial inspection offers a first line of defence for easy troubleshooting on the job. It is a camera small enough to carry around every day, always at hand. It is rugged and can stand up to dirt and water and survive a 1 metre drop. This gives users the power in their pocket to make enhanced infrared inspections and quick temperature scans of electrical equipment, machinery and other assets.

Connect Asset Tagging automatically saves thermal images to the right folders, eliminating the tedium of sorting and organising infrared images. By simply scanning an asset’s QR code or barcode, the infrared image and all of the applicable date and time stamped information will be stored to predefined folders. This data can be sent via WiFi or automatically uploaded once users connect to the network or computer via USB.

Users can also get the preferred level of infrared for each image with the 9 cm LCD touchscreen that offers IR-Fusion, blending a visible light image with an infrared image to easily locate problems by simply sliding a finger across the screen to adjust the setting.

Key features include:
• Automatically organises and files thermal images with Fluke Connect Asset Tagging.
• Fully radiometric thermal imager gives measurement data to the pixel with 120 x 90 infrared resolution (10 800 pixels).
• 9 cm LCD touchscreen display for easy troubleshooting.
• -20 to 150°C temperature measurement range.
• Six colour palettes.
• IP54 enclosure rating.

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

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The new generation of light grids from ifm electronic incorporates 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 set with single-beam sensors. No complex installation and adjustments are necessary anymore. In conclusion, ifm now offers a complete package for increased safety, configurable depending on application, and quick and easy to mount.

Compact IR camera with industrial accessories

Optris has announced additions to the Compact Line, the Xi 80 and Xi 400, now with new industrial accessories for use in rough conditions. The system has a modular design and as a result, the water cooled housing, the air purge unit and the shutter can be used both individually and combined.

Shutter mechanism protects the high-quality IR camera optics

This stainless-steel shutter is generally used to protect the optics from contamination and foreign objects. This is particularly important when the infrared camera measures upwards and the measurement objects are above it, such as in the glass industry. With a response time of just 100 ms, the IR camera is optimally protected from falling broken glass. Furthermore, the shutter can be used in intermittent processes so that the optics are exposed to environmental conditions only during the measurement process.

Temperature measurement in rough conditions

A stainless-steel, water-cooled housing and an air purge collar made of anodised aluminium are available so that the compact infrared camera can be used in rough conditions in the industry. Cooling allows for use in hot environments up to 250°C. The air purge unit protects against air particles and prevents condensation on the optics. It can be screwed on in 4 positions, allowing the air flow to be customised for the application. Integrated into the air purge unit is a silicone window that can be replaced without complex assembly steps if it suffers mechanical damage.

Tektronix simplifies automotive Ethernet testing with new software

Tektronix has released two new software packages that greatly simplify Automotive Ethernet testing, debug and protocol decode, for use with its 5 and 6 series mixed-signal oscilloscopes (MSO). Using the new Signal Separation software, automotive engineers can now perform Ethernet testing without disrupting the ECU system or cutting the Ethernet cable to install a directional coupler, while the PAM3 analysis package provides in-depth insight into signal characteristics at the system level.

As the move toward Automotive Ethernet or IEEE 802.3bw (formerly BroadR-Reach) technology in vehicles accelerates, comprehensive design validation is vital to ensure interoperability and reliable operation across multiple ECUs. Current Automotive Ethernet testing solutions require engineers install a directional coupler to separate the full duplex signal. This adds insertion and return losses and makes it difficult to determine if an error is a result of the system or the additional hardware.

To eliminate these problems, Tektronix’ unique Signal Separation software separates the full duplex signal by looking at voltage and current waveforms from both master and slave test points and provides separated signals using a proprietary algorithm. This method displays true ECU signals without the need for a directional coupler and provides full protocol debug of master and slave ECUs simultaneously. Tektronix Signal Separation software is easy to use, reduces testing costs and improves measurement accuracy. Signal Separation supports full life-cycle Automotive Ethernet testing from design through service. Users can use the solution for in-car testing, as well as Signal integrity testing during cranking or other scenarios.

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IoT data logger

IMS is known across the globe as a leading industry expert and manufacturer of condition monitoring data loggers and telemetry. The company performs data logger engineering, manufacturing and servicing in southern Africa, with products distributed worldwide. The solutions measure and record temperature, humidity, pressure, plus more than 10 other environmental parameters, and serve industries including food, pharmaceutical, energy and automotive. IMS is proud to present its new Internet of Things (IoT) temperature logger designed for condition monitoring on bearings and electrical motors. The benefit of condition monitoring is that it allows maintenance teams to respond timeously before bearing failure motor breakdowns occur.

The IoT-enabled device logs data at 10 minute intervals to the cloud portal www.tegnonefficiency.co.za, which allows users to view the complete history of each installed item. Access to the cloud is password protected and all data is available to be downloaded for local analysis or reporting purposes. The latest low energy, low cost microprocessor technology has been utilised to empower the new logger with a platform that enables customised implementation to meet the specific use cases. Software features include:

- Multiple graph overlay.
- Statistics.
- Data annotation.
- Min/max/average lines.
- Automatic report generation.
- Summary view.

Typical applications are found in calibration chamber monitoring, HVAC, medical/pharmaceutical, environmental studies motor bearings, pumps, and other electrical equipment.

For more information contact Ken Falconer, Impact Measurement Solutions, +27 11 020 5160, info@impactmeasurementsolutions.co.za, www.impactmeasurementsolutions.co.za

RS announces availability of interconnection solutions from HARTING

RS Components has extended its industrial connector portfolio with new solutions from HARTING, including the recently launched Han 1A connector.

The new Han 1A is a significantly smaller connector than the Han 3A, requiring 30% less space than the manufacturer’s previous smallest rectangular industrial connector. The unit has been developed to meet the demand for smaller interfaces used with the latest power engineering equipment deployed in modern networks.

A key feature of the connector is its versatility, which enables the easy creation of simple interfaces. It has a system of modular inserts and is constructed from a lightweight and durable polyamide plastic, making it suitable for a wide range of applications. In addition, the Han 1A uses the simple ‘click and mate’ system and provides a solution for on-site installation with screw contacts or for the pre-assembly of separate units with crimp contacts.

The connector integrates contacts for data, power and signal transmission: it has modules available for Cat 5 or 6A data transmission; it can handle a maximum of 16 A and 400 V, and has up to 12 D-sub contacts for signal interfaces. In addition, there is a shielded version for application environments that are susceptible to interference.

Overall, it provides an efficient solution for applications such as heating and cooling units, fans, control terminals, lighting systems, drives and vibration conveyors. It also meets the EN45545-2 standard for fire protection on railway vehicles, making it well suited for use on a variety of systems including door openers, lighting and screens. Accessories are also available, such as fasteners for wall mounting or colour-coded pins to help in the identification of signal lines. The use of additional housing elements or single-wire seals can also extend protection up to IP65, making it suitable for use in outdoor environments.

For more information contact RS Components SA, +27 11 691 9300, sales.za@rs-components.com, www.rsonline.co.za

3D sensors for robot grippers

The 3D sensor detects the object position, even when objects are moving, and transmits it to the robot control which activates the gripper. The system can detect rectangular, round and irregular shapes and transmit not only the position of their centre of gravity, but also their number and dimensions to the controller.

Typical objects are boxes, cardboard packages, buckets, kegs, cans, bags, wheels or luggage. Automated gripper systems increase the productivity of many applications, as they carry out monotonous manufacturing steps more quickly and evenly than a human.

In addition, monotonous movements with heavy objects are bad for workers’ health and lead to frequent absences. When robots take over heavy physical work, this increases machine uptime and releases human workers for tasks for which they are better suited.

For more information contact ifm - South Africa, 086 143 6772, info.za@ifm.com, www.ifm.com
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<td><a href="http://www.vega.com">www.vega.com</a></td>
<td>35,</td>
</tr>
<tr>
<td>WIKA Instruments</td>
<td>+27 11 621 0000</td>
<td><a href="mailto:sales@wika.co.za">sales@wika.co.za</a></td>
<td><a href="http://www.wika.co.za">www.wika.co.za</a></td>
<td>9*,24,38</td>
</tr>
<tr>
<td>Zest WEG Group</td>
<td>+27 11 723 6000</td>
<td><a href="mailto:info@zestweg.com">info@zestweg.com</a></td>
<td><a href="http://www.zestweg.com">www.zestweg.com</a></td>
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