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Experts predict that in the post-coronavirus world, digital technology will accelerate and transform the business environment. Endress+Hauser has a clear vision of this future. See this month’s cover story for more on how the company is using the IIoT to create new levels of service for its customers.

@Ease with Endress+Hauser

Pepperl+Fuchs, GHM Messtechnik SA

Krohne SA, VEGA Controls SA, Siemens Digital Industries, R&C Instrumentation, WIKA Instruments, Emerson Automation Solutions, Instrotech

Siemens Digital Industries, RJ Connect


Turck Banner, Instrotech

Beckhoff Automation, Pepperl+Fuchs, Michael Brown Control Engineering, ASSTech Process Electronics & Instrumentation

Danfoss, Zest WEG Group, SEW-Eurodrive
In this month’s issue, we publish the first updated version of Michael Brown’s Loop Signature series of articles, the material that forms the basis for his popular control loop training courses.

Mike began his career in loop tuning and optimisation in 1989 when a friend invited him to the USA to review a basic course which he had put together on the practical aspects of loop control. This had such an impact on him that he decided to sell the trio of control systems companies he had built and embark on a new profession. Since then, he has been going into plants as a consultant to investigate loop problems that left plant personnel baffled, sometimes even for years.

Today, Mike is a walking encyclopaedia of base-layer control knowledge, having worked on loop optimisation in over three hundred plants in Africa, the UK, Europe and USA. His interesting and highly informative Case History series – published bi-monthly in this magazine – has caught the eye of C&I professionals from around the world, who admire its straight talking style.

His writing exhibits a rarely found balance between theory and practice, and he enjoys teaching his subject and sharing in the enthusiasm of those who gain new insight into loop optimisation through attending his courses. To try and meet the constant demand that he should author a book on practical loop optimisation, Mike intends to publish much of the information dealt with in his courses in this new series of Loop Signature articles, to be featured in SA Instrumentation and Control magazine. Many of the ideas presented in these articles dovetail with the examples discussed in the Case History series, which deals with real-world loop problems encountered in plants around the world. In a nutshell, the Loop Signature series will cover the theory behind control loop optimisation, while the Case Histories will continue to focus on its practicalities. The first Loop Signature article covers the basic terminology and fundamentals of feedback loops. Interested readers will find it on page 40.

Digital postage during lockdown

In a bid to slow the spread of the virulent new coronavirus (SARS –CoV-2), the strict lockdown regulations imposed by our government have forced many businesses to close their doors for a while. Unfortunately, since the printer of SA Instrumentation and Control magazine is one of them, it has forced a slight delay in the distribution of the May print issue, although this will still be sent in May. As a workaround to keep readers informed and ensure that our advertisers receive uninterrupted market coverage during these uncertain times, we will be mailing you an advance-copy e-book version of this issue, in advance of your printed copy. We hope this will tide you over until we can distribute your hardcopy via the usual delivery channels.

In closure, the team at SA Instrumentation and Control wishes all readers and advertisers the health and strength to overcome the challenges that lie waiting in the months ahead.

Steven
Editor: SA Instrumentation & Control
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Emerson has announced that it has completed the purchase of American Governor Company, a leader in technologies and services for hydroelectric turbine controls. The addition of American Governor builds on Emerson’s technology capabilities and expertise in the renewables and power industry. Hydropower, the world’s largest source of renewable electricity, is generated by water running through turbines. American Governor’s solutions expertly control hydroelectric turbines, enabling utilities to provide reliable power generation that is highly responsive to the dynamic needs of the electrical grid.

The power industry is increasingly seeking opportunities to introduce digital transformation technologies to help predict, manage and control electricity generation coming from disparate sources. American Governor’s digital governor controllers, which complement Emerson’s industry-leading Ovation distributed control system and RX3i programmable automation controllers, are helping the industry realise the benefits of digital transformation for more efficient, safe and reliable operations.

MESA International has announced the development of a new model called ‘The Model for Smart Manufacturing’. The model will cover several intersecting dimensions including business intelligence, product lifecycle management, value chain management, manufacturing operations, the Industrial Internet of Things, asset management, workforce, and cybersecurity.

MESA has published various models throughout the years that cover the manufacturing execution and operations space, as well as enterprise-level strategic initiatives and business operations. MESA’s various models have been referenced in many publications, textbooks, and requests for proposals.

Due to current social distancing guidelines, working meetings will be held virtually throughout the year. The public is invited to contribute to the creation and vetting of the smart manufacturing model by joining MESA as a member.

Since the World Health Organisation moved to declare COVID-19 a pandemic in early March, public health experts around the world have advocated for self-isolation as a way to reduce the spread of the disease and ‘flatten the curve’. As more individuals stay home to reduce their risk of infection, drones are emerging as powerful tools, both helping prevent infections, and ensuring that life continues during the pandemic.

In countries hardest hit by the pandemic, drones have emerged as tools for authorities to communicate with citizens. In China, drones have been seen carrying signs with QR codes, allowing citizens to use mobile phones to register for support without requiring human contact and reducing the possibility of virus transmission. In Italy, drones with speakers attached have allowed police officers to communicate with citizens on the streets to remind them of self-isolation practice without the risk of transmission.

Unmanned aircraft system technology is also proving to be useful for disinfecting public spaces and epidemic prevention vehicles, through the use of remotely operated spray drones. Compared with hand spray, drone spray has many advantages in terms of efficiency and consistency. Chinese companies are also buying disinfection robots, to help fight infections within hospital environments.

For more information visit www.africandroneforum.org

Drones to the fore in the fight against coronavirus

MESA International announces development of Model for Smart Manufacturing

Emerson acquires American Governor

Don’t miss the June issue which will feature
How can field instruments and components easily be integrated into automation systems? The answer is becoming increasingly important as industrial production digitalisation progresses. The Endress+Hauser Open Integration partner programme unites 13 manufacturers that want to ensure the streamlined interaction of their products. Softing Industrial Automation joined the partner network at the beginning of the year. The Open Integration partners test and document the interaction of their products for typical process automation applications. Users profit in two ways by being able to combine the best products for each application, and through fast commissioning.

Automation technology suppliers value the advantages of the Open Integration programme as well. For these companies, it is important to be able to detect potential problems early and solve them prior to installing their products at customer sites.

“We go well beyond the established test methods within this programme by scrutinising the functionality of complete system architectures in a laboratory environment,” explains Jörg Reinkensmeier, marketing manager at Endress+Hauser. “We do that for specific fields of application or customer solutions. After successful completion of the tests, the so-called reference topologies are published in the form of mutual recommendations.”

Thirteen companies currently belong to the programme. All the partners are suppliers of control technology, fieldbus infrastructure, measurement technology or actuator systems: Auma Riester; Bürkert; Festo; Flowserve; Hima Paul Hildebrandt; Honeywell Process Solutions; Mitsubishi Electric; Pepperl+Fuchs; Phoenix Contact; Rockwell Automation; Schneider Electric; Turck; and recently, Softing Industrial Automation.

Network technology specialist
Softing Industrial Automation is a leading provider of products designed to integrate technologies and data in factory and process automation environments. “Our companies have enjoyed many years of successful cooperation, which has now manifested itself in our decision to join the Open Integration partner programme,” says Thomas Hilz, vice president, strategic accounts at Softing Industrial Automation. “The reliability and outstanding quality that we know from Endress+Hauser is also a top priority at Softing Industrial Automation. We are looking forward to the coming years in which we will be helping our partners with the connectivity of their sensors.”

“Softing Industrial Automation strengthens our partner programme with further expertise in the area of data exchange and providing information at the field level,” concludes Reinkensmeier. “Apart from networking process control technology, connectivity is playing an increasingly important role for IIoT solutions. Our aim is to exploit this potential together with all of our Open Integration partners.”

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

In memoriam: Vivienne Caroline Dorrington
It is with great sadness that we announce the death of our CEO, Vivienne Dorrington, after a long and brave battle with cancer.

Like her father, Ray Beaumont, who founded Technews Publishing in 1985, Vivienne was passionate about business-to-business technical publishing in South Africa and under her leadership the company continued to flourish and grow after she took over the reins from Ray.

Starting out as a young BComm graduate, Vivienne immediately found her feet in sales, proving to be a knowledgeable and formidable force here. She had an innate curiosity and business insight which she easily translated into workable marketing solutions for her customers and which later stood her in good stead as she led the company. Coupled with tenacity and intelligence, this insight and curiosity usually meant seldom ‘switching off’ and her passion for work was rivalled only by her love and pride in her children Laura and Michael.

One of her particular work passions was for the magazine Hi-Tech Security Solutions and even after taking over as CEO which obviously meant a change of direction, her passion for sales remained with her as she continued to lead her magazine and mentor the team to follow in her footsteps.

Determined, decisive, yet always compassionate, engaged and gracious, Vivienne was an inspirational leader whose presence, insight and enthusiasm will be sorely missed and it was a privilege to have worked with her and call her our friend. We also know she had tremendous impact on all who knew her and we will all go forward with irreplaceable memories of our tenacious champion.

We salute you Viv, our CEO, our mentor, our friend.
BMG, a leading South African engineering solutions specialist, has been authorised to provide engineering components and support services to businesses approved as essential service providers, during the country’s COVID-19 lockdown period.

“As a customer-driven business, the BMG team remains committed to making sure industry is able to continue operating as efficiently and as safely as possible during this difficult time,” explains Darryn Wright, group marketing executive, engineering solutions group, part of Invicta Holdings. “We are pleased to have been given permission from the Companies and Intellectual Property Commission (CIPC) to provide crucial engineering components and support, ensuring continuous operation of services throughout the country. We are determined to keep the wheels of industry turning and to help the people of our country, by providing critical engineering components.

“The team is on hand to assist essential service customers in many sectors, including food and beverage plants, water and waste water treatment facilities, coal mines and petrochemical plants. We also work closely with service providers to power generation and pharmaceutical plants, as well as in agriculture, ports, and rail and road facilities.

“BMG’s distribution centre in Droste Park, Johannesburg, is fully stocked to help and support customers around the country, and into Africa, with essential equipment and components. Our committed technical support and field service teams are also on hand to assist our essential service customers in any way they can.”

Essential service providers requiring assistance are invited to contact BMG at this emergency number: 0800 022 224.

For more information contact
Darryn Wright, BMG, +27 11 620 1516, darrynw@bmgworld.net, www.bmgworld.net

Becker Mining South Africa supplies uninterruptible power supply systems

Becker Mining South Africa has supplied 12 uninterruptible power supply (UPS) systems to a local coal mine supplier, to enhance safety and prevent unnecessary downtime. These specially designed systems ensure uninterrupted operation of the mine’s PLC system, particularly during power outages.

“This system was developed by Becker Mining as a dependable power backup system for the PLC system, which controls critical functions at the mine,” explains Nico de Lange, vice president operations & systems, Becker Mining South Africa. “These operations include all conveyor belt safety systems, gas monitoring, as well as speed, slippage and load control instrumentation. In the event of a power outage, the PLC would not be able to function without the backup of a reliable UPS system. The interruption of belt system and sensor monitoring would prevent normal operations and lead to costly downtime and could also become a major safety issue.”

During a power outage, the UPS system needs to supply the specified load, to ensure the electrical system continues efficient operation, for a specified time period. In this particular project, the 3,5 kVA system, with a two-hour backup time, has been designed to supply a full load current of 15 A at 220 V. This ensures the PLC system, with multiple outlets, runs efficiently even in the event of a power failure.

As this PLC system consists of many electronic devices, a pure sine wave is required to reduce induced electrical noises generated from the circuit. Without this critical feature, electronic components could malfunction and become a major safety risk, also causing costly downtime.

The enclosures of Becker’s UPS systems have an ingress protection rating of IP65, which guards against the ingress of dust and jets of water. This protection feature is particularly important in arduous underground conditions.

These inter-connected UPS systems, with Ethernet and RS-232 connectivity, can be remotely managed and monitored from the control station. This means in the event of a system failure, critical decisions can be made to prevent a disaster or unnecessary downtime.

For more information contact
Nico de Lange, Becker Mining South Africa, +27 11 617 6300, info@za.becker-mining.com, www.za.becker-mining.com
Aguru Business Solutions (Aguru), a company specialising in automation and digital transformation advisory and project management services, has announced that it has entered into a reseller agreement with Ennovia of Toulon, France.

Ennovia was founded in November 2007 with the mission to provide industrial companies with methodologies and innovative tools that reduce production and maintenance costs. Commenting on the mission, CEO Jean-Yves Kbaier said: “At the origin of our activity, we intervened mainly in the sectors of energy and the environment, in the areas of electricity production and water treatment. Subsequently, we diversified into nuclear and oil and gas with some large projects in the UK, Europe and the Middle East. Our mission is to develop new tools for operators based on information technologies such as big data, predictive analytics, cloud, and the Internet of Things.”

Through Aguru, Ennovia now brings smart maintenance management solutions to southern Africa in the form of the Quickbrain platform. This advanced yet practical system enables managers and technicians to optimise maintenance activities and extract the efficiencies at processing and manufacturing operations. Quickbrain is recognised for its ability to provide information on an ergonomic platform, facilitating efficient and rapid decision-making.

Johan Louw, founder and managing director of Aguru, said: “We looked for the right partner with a practical solution that will fit the African market. We needed an offering with a quick learning curve to maximise benefits for the operator, yet easily scalable to service large operations. Ennovia’s Quickbrain CMMS (computerised maintenance management system), met this and other technical criteria. The DMS (document management system) is fully integrated and of immense value to industrial companies wanting to deliver on their digital transformation objectives. We are extremely pleased with the capability and immediate support to service our clients.”

Commenting on the Covid-19 pandemic and the challenge for industrial operations to continue while key staff are working from home, Louw said: “We share a passion to develop human-machine partnerships that leverage human capital value. With solutions such as Quickbrain, our clients can be sure that their maintenance planning and execution remains on track, and tasks can be digitally assigned and progress monitored with minimal human interaction.”

For more information contact Johan Louw, Aguru Business Solutions, +27 82 711 1279, ceo@aguru.co.za, www.aguru.co.za

EtherCAT Technology Group seminars postponed due to coronavirus pandemic

The series of EtherCAT Technology Group (ETG) seminars, scheduled to be held in South Africa from 22-29 October, has had to be postponed due to the uncertainty relating to travel and event hosting as a result of the global coronavirus pandemic.

The seminars, jointly hosted in South Africa by the ETG and Technews Publishing, are an extension of those conducted around the world by the ETG, which focus explicitly on the EtherCAT technology and its applications. Presented by Martin Rostan, executive director of the ETG, the South African events have in the past proved extremely popular among SA’s control engineering fraternity. “It’s disappointing that we have had to postpone the October dates,” explains Rostan, “but the organising committee was simply faced with too much uncertainty to proceed with the arrangements at this stage.”

“We need to wait for clarity from both the South African and the German authorities regarding public gatherings, international travel and quarantine requirements before we can finalise new dates,” adds Technews director, Jane van der Spuy. “We are definitely not cancelling, however we do have to postpone until we have certainty on when Martin will be able to travel freely from Germany again, as well as when next we can safely gather to attend functions of this nature.”

Further announcements regarding the sessions, scheduled for Cape Town, Port Elizabeth, Durban and Johannesburg, will be made by the organising committee as soon as the situation stabilises.

For more information contact Jane van der Spuy, Technews Publishing, +27 83 234 5412, jane@technews.co.za, www.instrumentation.co.za
**Best of breed industrial software: announcement from Element8**

Element8 is proud to announce its appointments as authorised Ignition distributor for Inductive Automation, distributor of Canary Historian for Canary Labs, and distributor of Flow Information Platform for Flow Software.

“To better support our customers in South Africa, we are expanding the Ignition network and have named Element8 an authorised Ignition distributor,” says Annie Wise, director of international distribution at Inductive Automation. “Element8 will be an extension of Inductive Automation and its mission, as it provides local business development, sales and support in South Africa.”

“Canary focuses on making it easy to use your process data, and now, thanks to Element8, it will be even easier,” says Jeff Knepper, executive director of business development, Canary. “The suite of software solutions that Element8 is representing works together to give the end user information they can use to maximise the value of their operations.”

“Flow Software is excited to work with the Element8 team as our distribution partner into Africa,” says Graeme Welton, director, Flow Software. “We’re particularly excited to have been chosen by Element8 as one of the industrial software solutions in a highly accomplished, feature-rich offering.”

“We welcome this news, not only for ourselves but more so for the southern African industrial software community,” says Jaco Markwat, managing director, Element8. “It is our vision to build this distribution with our system integrator partners, and to provide our customers with a more flexible, cost-effective solution stack, with a focus on fast, efficient and responsive technical support.”

Element8’s best-of-breed solution stack includes:

- Ignition Scada.
- Canary Historian.
- Flow Information Platform.

For more information contact Clarise Rautenbach, Element8, +27 66 291 3119, clarise.rautenbach@element8.co.za, www.element8.co.za

**Endress+Hauser receives top rating for sustainability**

Endress+Hauser has been placed in the top ranking of companies in the EcoVadis sustainability audit for the fourth time in a row. The group again improved its overall result. With 72 points, Endress+Hauser is now among the leading two percent of all suppliers in the comparison group.

Since 2013 Endress+Hauser has been evaluated annually by EcoVadis with regards to sustainability; since 2016, the group has regularly achieved Gold Recognition Level ratings. The company again scored well or very well in the areas examined, namely environmental protection, fair business practices, sustainable procurement, working conditions and human rights. This makes Endress+Hauser one of the best rated companies in the comparison group.

**Valuable contribution to sustainable development**

“The challenges of the future demand that we and our customers manage our businesses sustainably,” emphasised Matthias Altendorf, CEO of the Endress+Hauser Group. “We help our customers to increase their resource efficiency, reduce CO2 emissions, avoid waste and improve the circular economy through outstanding measurement technology and automation solutions.”

The company also makes its own contribution to keeping its ecological footprint as small as possible. For example, it increasingly supplies buildings and infrastructure with sustainably generated energy or reduces travel, for example through virtual meetings. The EcoVadis report also highlights progress at management level, especially in dealing with issues such as environmental protection, working conditions, human rights and fair business practices.

Analysis based on global comparisons

EcoVadis uses 21 environmental, social and ethical criteria to evaluate companies worldwide in terms of their sustainability. In addition to an industry comparison, companies also receive suggestions for improvement. They can also use an Internet platform to assess their own suppliers accordingly. According to EcoVadis, this network now encompasses 60 000 companies worldwide.

For more information contact Natlee Chetty, Endress+Hauser South Africa, +27 11 262 8000, info@za.endress.com, www.endress.com
Already covering factory automation and Industry 4.0 in our publication SA Instrumentation & Control, security in our publication Hi-Tech Security Solutions (www.securitysa.com), and the Internet of Things in our publication Dataweek, it was a logical next step to cover the subject of home automation and security, without diluting the focus of our existing technical publications.

The monthly Smart Home Automation news brief will cover product information relating to the hardware and software technologies that enable control and management over appliances and devices within a home.

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Roodepoort 10-11 Jun 2020

For more information contact Claudia Olver, VEGA Controls SA, +27 73 172 1437, claudia.olver@vega.com, http://www.vega.com/

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For more information contact Vanessa Bonhomme, Siemens Southern Africa, +27 11 652 3206, vanessa.bonhomme@siemens.com, http://www.sitrain-learning.siemens.com/za

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Roodepoort 10-11 Jun 2020

For more information contact Claudia Olver, VEGA Controls SA, +27 73 172 1437, claudia.olver@vega.com, http://www.vega.com/
Amidst the turmoil of the latest coronavirus pandemic and the recent downgrade of South African government debt to junk, I’ve begun to wonder whatever happened to traditional values like responsibility and discipline in this topsy-turvy new world of ours. Thinking about it in the context of our own manufacturing industry, suddenly the world has opened up and choice of supplier has become almost limitless. Thanks to the power of the Internet, companies are able to go online and purchase equipment from sources that carry no stock, and often do not even have any brick-and-mortar facilities. Due to the low overheads, equipment from well-known suppliers can be offered at prices substantially lower than the recognised regional distributors – with their higher cost overheads – can match.

All well and good until the equipment does not behave as it should and the purchaser suddenly discovers that they do not have the necessary in-house expertise to rectify the problems. What they do then of course is approach the bypassed local representative insisting on immediate after-sales support – after all, it is their principal’s equipment!

If people exercised a little bit of old-fashioned responsibility and discipline, they would realise that for anyone to be able to install, service and maintain the equipment that was bought, they should at least be familiar with that equipment. Automation has become extremely sophisticated and it is often a case of ‘plug-and-pray’, rather than ‘plug-and-play’, for people not experienced on that particular equipment.

Also, the OEM (original equipment manufacturer) representatives ensure that if an item is brought into the country they take the responsibility to ensure that not only do they understand how this equipment works, but that they know how to repair it if it fails. What end users should realise is that by purchasing equipment from unrecognised online sources and bypassing the local representatives, they have cut off all the support they could have had if they had stuck to the authorised channels.

Once again, it boils down to the misconception that the representative companies are out to make inflated profits off our local industries, when, in fact, there is more than enough competition among the OEMs in South Africa to ensure that this does not happen. Actually, bypassing the local representative often results in an increased cost of ownership over the lifetime of a piece of equipment, despite the initial saving on the purchase price. It reminds me of that old saying my mother used to quote: “Don’t cut off your nose to spite your face.”

The better option by far is to stay disciplined and responsible and involve the local OEM representatives so that the entire South African economy can prosper. The fact that our investment status has been lowered to junk does not mean that we should all start acting irresponsibly and let our manufacturing facilities degenerate into junkyards.

Take care and stay safe and healthy through these trying times.

Yours in automation,
Johan Maartens.

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Durban branch

The last technology evening was held in March, and as we headed into lockdown we reluctantly cancelled future technology events pending the reopening of the country. There is much discussion about whether things will ever go back to normal in the guise that we know it, that the new normal will not be the same, and therefore this is a time of change and new challenges. We know that some things have served us well in the past and we would now be wise to leave them behind, but we also know that technology evenings in their current format work for all the right reasons, and so should not be left behind. Therefore, they are merely on hold. But, what we can and are taking out of this is that we can build on and augment the current model – reaching new audiences through technology and doing things remotely whilst we can’t all get together. We will keep everybody posted.

Sadly, playing golf remotely isn’t an option and we have, reluctantly, and after much debate, decided to postpone our July golf day. Watch this space for new dates.

Vaal branch

At the last technology evening, Albert Louw, mobile control systems specialist from ifm electronic, gave a presentation on control systems for mobile machines, applicable to all mobile vehicles from transport and logistics to construction and mining. He discussed that special hardware is required as well as the similarities shared with plant based PLC systems.

The demands on controllers and sensors used in construction machines, municipal vehicles, agricultural and forestry machinery, port facilities and cranes are extremely high. Units and machines are permanently exposed to harsh environments like heat, cold, moisture, mud, dust, shocks and vibrations, and often, even thunder and lightning.

The most important part is the mobile controller that offers free programmability, configurability of the inputs and outputs, and a CAN interface with CANopen and SAE J1939 protocol. Camera systems for mobile applications reliably monitor operating and rear areas. Camera images and process values are displayed on the user-friendly dialogue units which also support high-quality graphics. Applicable products range from mini controllers, decentralised I/O modules, sensors and components for diagnostics and service. All units have robust seals preventing the penetration of moisture. An IP69K system, including connectors and cables, ensures high ingress protection from the controller to the sensor.

**Swagelok online learning**

Due to the lockdown in South Africa, the branch was not be able to host Swagelok at the Sasolburg Bowling Club, but luckily, Swagelok was running a few online training sessions for their clients and they extended the invitation to the SAIMC members as well.

SAIMC member who are eligible to receive CPD points can complete a quiz on the SAIMC website for each of the courses to ensure they have completed the online learning.

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Technology evening: Introduction to Profibus

What an interesting time and age we are in. If anyone predicted what future would be knocking on our doors in 2020, they would be a millionaire.

With the country embracing technology in new and innovative ways, the branch decided to embrace the drive and host our first virtual technology evening. We would like to thank IDX (Industrial Data Xchange), PISA (Profibus, Profinet Southern Africa) and Kyle Roos for their assistance in hosting the event.

The training provided a basic understanding of Profibus and implementation methods. It described the technology, design concepts and common errors that occur from lessons learned on industrial network audits and breakdown callouts.

Kyle is a specialist in industrial communication protocols and systems. He is currently employed at IDX and the chairman of the PISA organisation. He specialises in training, designing and testing solutions for industrial networks in various sectors and his dynamic personality and passion is a feature of the training. We look forward to attending more of these sessions in the future.

IIoT/Industry4.0/4IR – they cover a large area and don’t always mean the same thing. So how do we define any of these terms? Basically, they are about improving manufacturing efficiency, largely through the intelligent use of data. There is a lot of jargon that goes with this, and Lloyd Townsend of WIKA did a good job of unravelling much of it at the last branch technology evening.

Since it is there, it is tempting to use the cloud for everything, as no investment in hardware is required. However, the drawback is that it can take a relatively significant time to get feedback on the data and hence the emergence of edge computing, where time-critical information is processed right at the application.

Where does the data come from? First of all, a 4-20 mA signal can be used. However, it can only be used once it is in digital form by the control system. Microprocessor-based instruments usually contain much more information than just the process variable, and this can also be used. If the field devices are connected to a bus, whole groups of data can be aggregated, and sent to the cloud in a batch, using a variety of communication protocols. As this data is not usually time-critical, security and accuracy of data is more important than speed. There are a variety of LPWANs (low power WANs) which can do this, one of the more recent being MIOTY. The essence of this is that that the data is broken down into packets, and forward error correction applied. This minimises requests for repeat packets, and, because the data is scattered in small packets, it is difficult for potential hackers to trace.

What about digital twins? As Lloyd explained, system designers generally have a good idea of the desired operation of any system. A virtual – or digital – twin is created, which reacts in the same way the physical system is supposed to, somewhere in the cloud. This can be compared with its real-life counterpart in the cloud, to check whether the desired outcome has been achieved.

Lloyd covered a huge amount in a short period of time, all of it very well presented. The branch thanks WIKA for hosting the evening.
Commonly known as ‘the smile maker’, Dairymaid’s ice cream has been a favourite in many South African households for the past three decades. Keeping the factory running and ensuring the quality of the ice cream remains at an exemplary level is critical to the brand’s reputation.

PCS Global was the first choice to upgrade the Clayville, Gauteng, factory’s control system. Wonder Phakathi, control systems engineer at PCS Global, explains: “Two years ago, Dairymaid contacted us on Christmas Eve with a downtime problem on the production line. We assisted them and the problem was quickly resolved. This resulted in PCS subsequently providing a consulting service and, during a complete system audit, we identified a number of key risk areas that were affecting productivity.”

Centralisation of systems
The existing system at the Dairymaid production facility had a number of issues which needed to be addressed to ensure minimised downtime and enhanced productivity. Phakathi says that the outdated Wonderware system licences posed a risk as they were based on an old, legacy operating system which was no longer supported by Microsoft. In addition, a number of redundant licences were not being used.

“Lack of centralisation of systems was another pressing problem,” explains Phakathi. “Outdated infrastructure and non user-friendly interfaces meant that not only was the system unstable, but it was also difficult to isolate problems efficiently. This ultimately led to losses, so in order to ensure that the company was not plagued by unnecessary downtime, we needed to upgrade the system.”

The upgrade process firstly entailed a complete restructuring of the control systems architecture. The primary intention was to eliminate standalone systems and create a centralised data repository. The firmware and the hardware were both outdated, making the system cumbersome and ineffective. The look and feel of the SCADA was updated and optimised to make it easy for the operators to fault-find.

“The Wonderware packages were in fact two versions older than current firmware models, leading to minimal support available for them,” says Phakathi. “Similarly, the hardware was an outdated version going back to 2008, making it extremely slow and prone to excessive downtime.”

System upgrade
According to Phakathi, the biggest challenge PCS faced was in retrieving the data from the legacy system: “We encountered a large number of corrupted data backups, so it took us much longer than expected to update the system. In addition, we had to perform the upgrades while production was underway, in order to further minimise downtime. The project was a learning curve for all and has highlighted the problems encountered when regular firmware, software and hardware updates are not performed.”

PCS upgraded the control system to a virtualised server which allocates functions according to the new architecture. The development environment, which includes Wonderware System Platform and Historian (2017 versions), was centralised for ease of management and control.

The project started in April 2019 and commissioning and handover began in early November. “We have added on further elements as the project evolved and we are currently still working with the Dairymaid team to ensure that the system is optimised,” says Phakathi. “The expanded system is now completely stabilised with added functionality and a reduction in downtime of an admirable 41%. The project was rapidly and efficiently deployed, resulting in a return on investment within two months. The success of this project has resulted in Dairymaid’s management initiating audits on other areas within their operations and the cost savings they have realised from the reduced downtime is now being allocated to further optimisation.”

PCS Global provided training on the new system and provided the operators with an SOP manual and insights on how to leverage the benefits of mobile apps to provide a further, remote level of monitoring and control. The new system is highly intuitive, making it easy to navigate and produce beneficial reports. Phakathi concludes that the feedback that PCS has received is that the site coordinator and operators are now more inclined to use the software, resulting in a more productive environment.

For more information contact Sabin Nair, PCS Global, +27 11 466 4172, sabin@pcsglobal.com, www.pcsglobal.com
SCiBOTRON’s quality culture
the key to success

SCiBOTRON was incorporated in Pretoria in 2013 as an automation engineering company focused on industrial process control, automation, software development and systems integration. The company has a highly experienced staff complement – including 10 engineers and technicians – who cater to a number of blue chip customers across a variety of industries that include mining, energy ancillary services, water, oil and gas and food and beverage within South Africa, southern Africa and internationally.

The company was founded on lean principles and quickly grew into a QSE (Qualifying Small Enterprise). Ricardo Paddy, managing director and founding member, attributes one of the reasons for the company’s success to an internal culture focused on providing each client with high-quality services and products: “We have built a reputation for ensuring that our customer services and products are of the highest quality possible. We do not limit ourselves in our thinking when it comes to providing our clients with the best possible solution. By applying our technology-agnostic stance, we are able to provide optimum solutions for all our clients. As a result, we have often been called in by organisations to rectify their automation quandaries quickly and efficiently.”

The organisation’s quality culture is propagated from grass roots level across all projects. “If we are able to follow quality processes, produce quality documentation and services for our smallest endeavours, then we are able to do it for the biggest ones as well,” says founding member, Veronica Paddy. “We completed our ISO9001:2015 certification process at an early stage of business to ensure that every employee adopts a quality culture from the get-go. The results speak for themselves.”

Complete lifecycle immersion in each project
SCiBOTRON’s services include industrial process control automation, automation and process control consulting, engineering project management, custom automation software development and turnkey EC&I services. Recently, it expanded its offering to include a comprehensive list of Industry 4.0 solutions such as: virtual reality, augmented reality, digital twinning, Industrial Internet of Things (IIoT), cloud solutions, analytics, and intelligent systems, all seamlessly integrated to provide a complete, digitally transformative solution for clients. “We are developing Industry 4.0 solutions for platform and software services that allow customers to easily integrate their systems into our IR 4.0 infrastructure without the need for costly upfront capital expenditure,” explains Ricardo Paddy.

The team offers its clients complete lifecycle immersion in each project, from concept to handover and maintenance, encompassing a 7-quality-gate agile process to ensure that each project runs on time, to specification and within budget. The company tackles both greenfields projects as well as brownfields modification projects, and offers complete validation of technical input.

This BEE Level 2 company invests a substantial amount of time and resources in research and development to remain at the forefront of technological developments in the industry. “We employ an extremely responsive methodology from strict control on mission-critical applications – in the gas pipelines industry for instance – through to agile workflow on process control,” emphasises Ricardo Paddy. “This allows us to offer our clients a substantial and quick return on their investment. This is all underpinned by our emphasis on developing strong relationships with our clients, which ultimately results in the difference between project success and failure.”

SCiBOTRON has experience in successfully commissioning software systems on seven national keypoint sites and one JSE-listed company in South Africa. It has also engaged with major industry leaders and is often contracted as a subject matter expert on high-value projects where it consults on standards, libraries and execution lifecycles.

“Enabling our clients to achieve full utilisation of their production facilities by providing them with internationally-leading solutions is about more than just doing business,” concludes Ricardo Paddy. “In the long run, we are enabling the economy to prosper and improving the lives of people in many communities.”

For more information contact Ricardo Paddy, SCiBOTRON, +27 12 030 0340, info@scibotron.co.za, www.scibotron.co.za

14 May 2020 www.instrumentation.co.za
System integrator Autotronix is mindful of the fact that this is a difficult time for many of its customers. “For many, they have been running legacy control hardware that is now more than two generations old,” says company managing director, Sudarshan Chetty. “Furthermore, there are often no spares available from the OEM, nor are there direct replacement parts available that are compatible with the existing hardware. This is complicated by legacy software that makes use of older communication ports that are no longer present on modern laptops.”

The challenge is extreme in the manufacturing sector, where legacy hardware is inherited from an already ageing machine that had already seen the end of its service life overseas, even before it was installed locally.

Chetty adds that for servo hardware this is certainly no exception, no matter how well the PCB hardware is designed. The PCB or some component on it will eventually fail. This can be attributed to ageing, voltage/current spikes, contamination, corrosion and the harsh environment under which these drives operate[1]. “For these customers, we face an enormous challenge,” he explains. “How do we continue to support them technically without compromising their production, in the full knowledge that they have a ticking time bomb on their hands? We start by evaluating their maintenance strategy. For many of our clients, maintenance strategy involves servicing the mechanical hardware and keeping spare electronic components. Unfortunately, for complex hardware such as drives and motion controllers, these often require additional programming. In such cases, we recommend backing up the software and configuration files so that the spare boards will have software that can be loaded when required. This reduces repair and maintenance time.”

For customers that do not have these backups available, the challenge is enormous. Should the hardware fail, programming can take anywhere from a few weeks to several months, depending on the number of servo axes and the complexity of the motion. Add to this the migration of the new servo hardware with the ageing motion controllers and PLC CPU.

“As a mitigation strategy, we do recommend that these software backups be done at least every six months, or after any field changes have occurred,” says Chetty.

“Whilst there are several challenges when contemplating legacy hardware migration, it all boils down to cost and mean time to repair. Depending on the complexity of the machine, we can offer migration onto new platforms in less than 8 hours per axis.”

“In light of the COVID-19 pandemic and the economic constraints the industry will most certainly face, we want to offer all our Mitsubishi users who want to migrate to the new servo platforms a 90-day payment holiday starting from 1 May 2020,” concludes Chetty. “This will be subject to credit approval and terms and conditions, and limited to a 2-axis servo system under R200 000 excluding VAT.”

References

For more information contact Sudarshan Chetty, Autotronix, +27 31 705 0400, info@autotronix.co.za, www.autotronix.co.za
### Consulting engineers, system integrators & project houses

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Whether you are a consulting engineer, a system integrator or a project house, we have the perfect marketing platform to put you in touch with nearly 5000 relevant control and automation practitioners in the automotive, food & beverage, mining, petrochemical, power, pulp & paper and water & wastewater industries.
“Experts predict that in the post-coronavirus world, digital technology would have accelerated and transformed the business world,” says head of marketing at Endress+Hauser South Africa, Natlee Chetty. “Currently, we are all faced with a unique situation. Many companies must find alternative ways and places to operate their businesses – be it working from home, the lack of access to catalogues and paper documents, or the visit restrictions to their offices. None of us have all the answers, but at Endress+Hauser our mission for the future is clear. We will continue to develop our digital offering and services based on our endress.com and Netilion platforms to enable efficient operations of our customers’ plants, resulting in increased productivity and cost savings.

“We have also developed what we call a ‘Seamless Customer Journey’, which is all about ease of doing business with our customers. We aim to provide our customers with an unforgettable, customer centric experience through endress.com – a smart and powerful digital platform that enables easy navigation within a few minutes, in the office, in the field, or on the go. Endress.com allows customers to review previous transactions, get quotations, purchase products, order spare parts, download documentation, and get access to contacts wherever they are – personally and digitally.”

**Using the IIoT to create new levels of service**
Endress+Hauser’s Netilion solutions are designed with the intention to empower customers to optimise productivity and plant availability at any time and from anywhere, enabling the flexibility required in these uncertain times. It has never been more important for manufacturing companies to be ready and equipped with technologies that will put them at the forefront of their sectors.

“Our state-of-the-art devices provide a vast amount of useful data which our customers can utilise to drive productivity,” adds Chetty. “Our innovative products can be easily integrated into the cloud, mobile devices and artificial intelligence, to create the ultimate future experience in plant technology. Using the data of connected products to engage with customers in new ways and on one integrated platform is in accordance with our digitalisation motto for process automation: #empowerthefield!”

**Step by step into the digital age**
One look at a smartphone is enough to bring you up to date on many everyday issues. Is
everything all right at home? How are my shares doing? And how many fitness points have I collected today?

Soon digital convenience will also be the norm in the process industry. Endress+Hauser is working on IIoT solutions in order to make the data from all the sensors of an industrial plant easily accessible from anywhere. Digital interconnection is on its way.

Part of Endress+Hauser’s IIoT strategy is to develop specific applications that integrate seamlessly into existing plant technology and immediately provide users with added value. The first application is called Endress+Hauser Analytics, which enables a digital inventory of the installed base to be captured. With Endress+Hauser Analytics, all field devices in a plant can be easily categorised and analysed, even those from third-party manufacturers. An interface module installed in the network, in this case an edge device, independently recognises the various instrument types and creates a digital twin in a cloud-based hub.

Alternatively, the devices’ nameplates can be read by the Endress+Hauser Scanner app and the information can be automatically uploaded to the cloud application (Netilion), where they are compared and added to the Endress+Hauser device database. Endress+Hauser Analytics reduces the time for taking inventory down to a fraction of that required for manual recording. Through the app’s clear interface, which can be accessed via mobile devices as well as the office PC, customers can view device data and documents such as calibration certificates or repair reports. Furthermore, they also receive information on the criticality of measuring points, on standardisation opportunities, as well as successor products should a device require replacing.

The key elements of Endress+Hauser’s IIoT ecosystem, Netilion interface modules for connectivity and the Endress+Hauser device database help to realise the full potential of intelligent measurement devices and create the foundation for algorithms that connect the existing device and process data, therefore generating added value for users in the form of digital applications.

The cloud data is encrypted and securely stored in certified research centres. Further applications based on the Endress+Hauser IIoT ecosystem are also set to be ready for the market soon. An application for asset health monitoring will monitor the status of the installed base and is set to enable predictive maintenance. Endress+Hauser Smart Metrology is going in the same direction: This application will enable the optimisation of the calibration intervals of pH sensors. Another application for water quality will allow for the simple and cost-effective remote monitoring in water applications.

The IIoT ecosystem provides customers the opportunity to enter into a new relationship that goes beyond the sale of products. Partnering with Endress+Hauser enables manufacturers with new ways to optimise plant processes, perform predictive maintenance and ultimately reduce plant downtime and unnecessary associated costs.

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

“We aim to provide our customers with an unforgettable experience through endress.com.”
The safety of a plant is a top priority for operators and manufacturers of chemical plants. For companies, it is important to have an expert on hand for support and advice regarding projects in the field of explosion protection. Choosing the right electrical explosion protection method is as individual as the customer’s requirements, and the plants themselves. Pepperl+Fuchs offers its customers unique solutions that are individually adapted to the project and the application of each individual customer. The company advises its customers during the design phase with in-house engineers planning and developing the ideal product and recommends the ideal type of protection for the respective requirements. Customers can choose from solutions with the following types of protection: purge and pressurisation (Ex p), flameproof enclosure (Ex d), increased safety (Ex e), intrinsic safety (Ex i), and combinations of these types of protection. In conjunction with global and customer-specific approvals, the customer is provided with products and services that allow them to concentrate on the core area of business in their field.

Automation of the process industry

On the whole, explosion protection is becoming more complex because plants are increasingly networked and automated. The problems faced today are different than those faced ten years ago. This increases the need for solutions that use industrial sensors in hazardous areas. As an expert in the field of sensors and explosion protection, Pepperl+Fuchs is particularly focused on bringing its own sensor technology to Ex Zones 1 and 21 for its customers.

A recent project undertaken with a manufacturer of fall protection systems for filling tankers with liquids uses the R2000 photoelectric sensor to monitor whether the fall protection system is optimally positioned. This process is to be implemented in hazardous areas as well now. The objective was to help customers in the chemical industry to protect people, plants, and the environment from hazardous chemical substances during the filling process. Pepperl+Fuchs engineers facilitated and developed an individual solution for the customer. The R2000 was installed in an internally developed flameproof aluminium enclosure with a viewing window without the signal quality of the R2000 being compromised. The solution was specifically tested, calibrated, and approved for Zone 1, 21, and Zones 2 and 22 for this application.

Customer-specific certifications for individual solutions

Pepperl+Fuchs offers special services with approvals in accordance with the ‘system certificate’ for solutions with protection type Ex p. Within the scope of this certificate, the company is qualified to certify solutions with protection type Ex p in accordance with ATEX and IECEx as a notified body. The major advantage of this is the flexibility to take into account the certification requirements in the design and planning stages. This results in cost-effective and above all quick approvals for customer-specific purge solutions. The highly qualified engineers at Pepperl+Fuchs oversee every stage of the project in close collaboration with the customer. From the design phase to joint acceptance, change and adjustment requests are discussed directly and incorporated into the specification. There is no need to involve an external certification authority. This means that the certification process is not unnecessarily prolonged. The system certificate, which documents all variables in detail and in full, makes it easier to coordinate with the customer and ensures an efficient approval process.

Approvals for purpose-related use are not unusual today, for instance in paint shops, where companies frequently require individual evidence of silicone-free materials or other paint-wetting-impairment substances (LABS). Pepperl+Fuchs offers a certificate for its products to prove LABS conformity, which is listed in the VDMA 24364 standard sheet which defines the hazard classification, including a categorisation and assessment of the products to be tested according to their specific location of use. This makes individual tests obsolete for customers and manufacturers. With the certificate, paint shop employees can use the precisely defined test methods to determine whether the product is suitable for the intended purpose. The Pepperl+Fuchs portfolio includes LABS-compliant terminal boxes, controllers, and control units for LABS Zone 1 in accordance with test classes A1 and B2.

For more information contact Pepperl+Fuchs, +27 87 985 0797, info@za.pepperl-fuchs.com, www.pepperl-fuchs.co.za
Martens, part of the GHM group of companies, has introduced its MLC 437 capacitive level switches for use principally for the registration of limit levels, full/empty signals in pipes and tanks in fluid, pasty and powdery media, and for the dry running protection of pumps.

Jan Grobler, managing director of GHM Messtechnik SA, commented: “The MLC 437 has an analog output and a DK-value (dielectric constant), which will open up the door for applications requiring the measurement of differences between oil and water levels – a crucial element to maintaining consistency in the manufacture of products such as chemicals, pharmaceuticals and cosmetics, including applications where hygienic areas are essential”.

The design of the switch makes it suitable for hygienic applications in the hygienic and chemical industry. The parts of the Martens MLC437 switch that come into contact with the media, consist only of materials which conform to FDA. With the aid of the microprocessor-controlled measurement, the user can adapt the parameter setting to the process environment using a PC.

“A unique feature of the MLC437 is that during operation, if an error or condition occurs, the display backlight can be set to change colour,” said Grobler. “This is an easily identifiable alert for engineers to see the condition and address the error.”

During measuring operations, the LCD display shows measured values. According to parameterisation, the backlight can be permanently operational or the device can enter the power safe mode.

The Marten MLC437 capacitive level switches register fluid, granular and pulverised media (not for use in areas subject to the risk of explosion).

This charge transfer measurement procedure makes use of the storage capability of charges in the medium. The switch tip and the tank wall (or built-in adaptor/sleeve) thereby form an electrical condenser.

If the switch is in the air, a specific low initial capacity is measured. When the switch is immersed in the medium, the capacity change is based on a change in the effective permittivity in the area of the measuring tip. This value is determined by the geometry of the switch and the DK-value of the medium. The measurement procedure enables the monitoring of the product and the detection of any separating layer, e.g. water/oil. Influences due to foam formation and adhesions are minor to non-existent.

Technical features
Power supply – supply voltage: 18-30 V DC, (100 mA max); electrical connection: M12x1 plug; CE conformity: EN 61326:2007-05; ambient temperature: -20°C to 60°C; climatic class: EN 60068-2-38:2010-06; vibration class: EN 60068-2-6; GL test2; certifications: EHEDG Certificate No. 28/2011.

Sensor – radiated frequency 40.68 MHz, <1 mW; measuring range: DK-value 1,5 – 175; initialisation time: 3 seconds; process temperature: -20°C to 100°C; CIP-/SIP-capable; process pressure: -1 to 10 bar; process material: PEEK, FDA approval number 21CFR177.2415 (food-safe according to EHEDG and conforms to Regulation EC 1935/2004 and 10/2011).

The switches are easy to service and maintain.

For more information contact Jan Grobler, GHM Messtechnik SA, +27 11 902 0158, info@ghm-sa.co.za, www.ghm-sa.co.za
Krohne has introduced four new additions to the Optiflex series of guided radar (TDR) level transmitters. Each device is designed for specific areas of application in the chemical, oil and gas, power, metals, mining, pharmaceutical, and food and beverage industries.

Optiflex 3200 is the first choice for applications with hygienic requirements in the pharmaceutical and food and beverage industries. It features a CIP/SIP-suitable hygienic design for liquid level and interface measurement in small vessels with process conditions up to 150°C and 40 bar. Insensitive to steam, foam and condensation, the device offers a measuring range 0.6-4 m with an accuracy of 2 mm.

Optiflex 6200 is designed for solids from granulates to powders in the chemical, agri-food and metals industries. It can be used for level measurement in silos up to 40 m with a measuring accuracy of 2 mm. Designed to withstand high traction loads and process conditions up to 200°C and 40 bar, it is insensitive to dusty atmosphere or deposits on the probe.

Optiflex 7200 aims at the chemical and oil and gas industries for level and interface measurement in small vessels with process conditions up to 200°C and 40 bar. Insensitive to steam, foam and condensation, the device offers a double ceramic process seal and an accuracy of 2 mm.

Optiflex 8200 has similar features and offers a double ceramic process seal system for liquids up to 315°C and 320 bar. Both devices offer dynamic gas-phase compensation (DGC) with the coaxial probes, ensuring accurate measurement without increased blocking distance in applications where the composition of the gas above the liquid can change suddenly, e.g. in steam boilers.

All four new TDR transmitters feature 2-wire 4-20 mA HART 7 communication with an optional second output (current or relay) and a real-time clock for event logging. They have been developed SIL 2/3-compliant according to IEC 61508 for safety-related systems and come with various Ex approvals. Common features also include a quick coupling system as well as compact and remote converter versions made of aluminium or stainless steel. Together with the cost-effective Optiflex 1100 for basic liquid applications and the Powerflex 2200 for liquids in the nuclear industry, they represent the Krohne guided radar (TDR) level transmitter portfolio.

For more information contact Deon Rampathi, Krohne SA, +27 11 314 1391, d.rampathi@krohne.com, www.za.krohne.com

Vega’s solutions for pharmaceutical applications

The special challenges faced by the pharmaceutical industry result from the wide diversity of its processes. Success depends on the consistency and continuity of the production processes, whether it be mixing, filling, autoclaving or CIP and SIP cleaning.

This makes it all the more important for operators to be able to rely on the measurement technology deployed on the plant. Level and pressure sensors from VEGA have made a name for themselves over many decades for their reliability and longevity. Robust, versatile and easy to use, even under extreme conditions or strict regulations, they provide important impetus for greater plant safety and efficiency.

Complete supplier for level and pressure
VEGA has completed its measurement portfolio for pharmaceuticals production with two new compact instrument series, comprising of pressure sensors switches and point level switches. The product families Vegabar and Vegapoint prove that automation can be both simple and highly efficient at the same time, without compromising reliability, hygiene or accuracy. The new measuring instruments are perfectly tailored to standard applications that nevertheless require high quality. Their standardised hygienic adaptor system provides the flexibility needed to keep installation effort and parts inventory to the minimum. The process fittings can be interchanged and adapted to local requirements.

Thanks to the all-round status display, all sensor states can be easily seen from any direction. This illuminated ring, which can be customised from a choice of 256 different colours, remains clearly visible, even in daylight. At a glance, the user can see if the measuring process is running, if the sensor is switching or if any sensor management is required.

There is a lot of sensor intelligence built into the new compact series: the standard IO-Link protocol ensures both universal and simple communication. This means that, via the standardised communication platform, seamless data transfer and simple system integration are enabled.

Easier with wireless operation
VEGA has also integrated wireless communication into its new Vegabar and Vegapoint measuring instrument series. The sensors can connect via smartphone or tablet, which is especially useful in environments such as clean rooms, where setup and operation become considerably easier.

For more information contact
VEGA Controls SA, +27 11 795 3249, leandih.hendrikse@vega.com, www.vega.com
Siemens has introduced the Sitrans LR100 series 80 GHz radar level transmitters, a compact instrument with a narrow beam for flexible installations in existing vessel openings or even non-intrusively through plastic vessels. The transmitters’ 80 GHz high frequency delivers robust, reliable measurements even in challenging environments such as those with vapours, condensation, turbulence, or solids. The custom microchip technology delivers fast response and extremely high sensitivity to detect even the weakest of signals.

The series consists of three products: Sitrans LR100 for basic measurement to 8 metres; Sitrans LR110 with communication and hazardous approvals options, and range to 15 metres; and Sitrans LR120 with communication, range to 30 metres and optional submergence shield for flooding protection. These 2-wire loop powered transmitters with HART or optional Modbus RTU connectivity consume very little energy and the fast startup is ideal for CSO (combined sewer overflow) applications.

The transmitters’ dependable readings reduce worker exposure to hazardous situations: no need to climb tanks, lean out over sumps, or crawl into confined spaces to maintain instruments. Also, zero-metre blanking distance allows measurement right up to the sensor, thereby avoiding costly overfilling, and the 2 mm accuracy enhances operational safety through precise measurement across the full range of the applications.

All this robust performance is wrapped in an IP68 submersible housing constructed of corrosion resistant PVDF. Simple commissioning is achieved with the Bluetooth interface and the Sitrans mobile IQ app or the Sitrans RD150 remote display. In remote areas connected to the Sitrans RTU3030C remote terminal unit, critical data can be transmitted and remote servicing can be performed.

Integrating critical level readings or process control data into operations can unlock new opportunities to react to safety concerns, analyse processes and identify areas for improvement. Users can monitor level measurements or diagnostic and maintenance information from the comfort of the control room, or connect to Siemens MindSphere, the cloud-based open IoT operating system.

For more information contact Jennifer Naidoo, Siemens Digital Industries, +27 11 652 2795, jennifer.naidoo@siemens.com, www.siemens.co.za
Intrinsically safe temperature monitoring in Ex areas

All models of the versatile Raytek MI3 Compact series infrared transmitters are now also available as intrinsically safe versions for use in hazardous environments. Intrinsically safe devices prevent explosions in hazardous locations by limiting the energy and surface temperature of the device under normal operation, or when conditions arise that could become hazardous. Devices are approved as intrinsically safe only after passing the rigorous approval process required by a recognised entity.

The intelligent MI3 miniature sensors are now fully ATEX and IECEx certified for use in Zones 1 and 2 (gas) and Zones 21 and 22 (dust). The package includes the sensor, communication box and an Ex power supply. All three components are IP65 rated. One or two intrinsically safe MI3 sensing heads can be powered by one power supply. The sensor cables can be up to 30 m long in total, providing high flexibility for setting up safe monitoring scenarios. The communication box, power supply, and sensing heads can be easily exchanged in the field without re-calibration of the entire system.

With a separate IP65 housing for communications electronics, which can be mounted up to 15 m away, the MI3 head sensor is possibly the smallest on the market and is easily installed in the tightest of locations.

The MI3 series comprises pyrometers for various spectral ranges and applications, including the 1M and 2M shortwave models with an excellent 100:1 resolution and 10 ms response time, which are suitable for monitoring temperatures up to 1800°C. Each intrinsically safe MI3 sensing head is labelled with the Ex certification. The MI3100 model’s Ex certification also covers the laser sighting function for easy positioning and aiming. MI3 sensors have excellent EMC characteristics and can be used in ambient temperatures up to 180°C. Communication boxes are available with RS-485, Modbus, Profinet, Ethernet TCP/IP and Profinet IO interfaces. Automatic head detection and digital communication between sensor and box enable plug-and-play setup.

With the addition of ATEX and IECEx certification, the MI3 series can now be used in many additional areas – for example, in steel industry processes using hydrogen atmosphere, such as galvanising, annealing, plating and coating. Other application areas include hydrogen reduction in the solar industry, petrochemical (sulphur recovery, boilers, reactors, pipes, flare control) and chemical (fertiliser, starch, alcohols, flower, vinyl) processes, mining (monitoring) conveyors and equipment, fire detection and storage terminals (coal, wood pellets, sulphur, petroleum coke, starch), hazardous waste disposal and sewage, as well as ink, laminate and coating processes that emit volatile vapours, and more.

Thermalert TX

Although discontinued and replaced by Thermalert 4 for the standard version, the Ex certified TX is still available. Temperature ranges are up to 2000°C, and options include stainless steel or aluminium construction plus additional cooling for ambient temperatures of up to 175°C.

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

Top-mounted level indicator

WIKA’s model UTN top-mounted level indicator consists of a measuring chamber, a float with guide rod and a magnetic system. Mounting onto the vessel is made via appropriate process connections (flanged or threaded).

The permanent magnetic system, which is connected to the float via a guide rod, transmits the liquid level measured in the vessel by the float, contact-free, to the magnetic display mounted to the outside of the measuring chamber.

In this magnetic display there are red/white plastic rollers or stainless steel flaps with bar magnets fitted at 10 mm intervals. The magnetic rollers or flaps are turned 180° through the walls of the measuring chamber: for an increasing level from white to red and for a falling level from red to white. Thus the magnetic display indicates the level of a vessel as a red column, without power supply.

For more information contact WIKA Instruments, +27 11 621 0000, sales.za@wika.com, www.wika.co.za
MLC437
CAPACITIVE LEVEL SWITCH

- 2-port isolation
- Microprocessor controlled measurement
- Parametrisation via built-in display and GHMware with Mini USB interface
- No moving parts in the medium
- 2 switching outputs
- Analog output for DK value
- Switching functions programmable
- Condensate-stability type
Emerson has released the Daniel T-200, a titanium-housed transducer, for its gas ultrasonic flowmeter product line, marking the first use of metal 3D printing to enhance the acoustic performance of ultrasonic flowmeters in custody transfer applications. The T-200’s robust design provides increased reliability, uptime and safety while achieving the highest accuracy class attainable in gas measurement.

In an ultrasonic flowmeter, transducers generate acoustic signals that are sent back and forth across the fluid stream. The arrival times of these signals determine the fluid flow velocity. Signal quality and strength are critical to measurement accuracy, which is paramount in custody transfer applications. An error of only 0.1% can equate to hundreds of thousands of dollars annually in a large-diameter, high-pressure pipeline.

To boost signal strength through the titanium housing, the T-200 uses a metal 3D-printed mini-horn array, which consists of an intricate geometrical structure of titanium horns and a titanium diaphragm that acts as a harmonic oscillator and matching layer. This maximises the sound energy coupled into the gas, which improves the signal-to-noise ratio and accuracy of the measurement.

“The T200’s mini-horn array could not be made without metal 3D printing technology, making it transformational to the sound quality and performance achievable through a titanium barrier,” said Kerry Groeschel, director of ultrasonic technology, Emerson. “Emerson is committed to developing innovative solutions that help our customers achieve safer, more efficient operations.”

The meter’s all-metal housing provides a barrier from corrosive hydrocarbon fluids and wet gas, thereby extending the life of transducer components and ensuring stable performance. This unique design allows the meter to be hydrotested with transducers in place, steam cleaned while in the operating line and blown down with no limits on the rate at which the meter can be depressurised.

The T-200 can also be safely extracted while the meter is under pressure without special high-pressure extraction tools, which reduces the possibility of greenhouse gas emissions during extraction. The capsule which contains the piezoelectric crystal used to produce ultrasonic sound waves is retractable as a single piece for simplicity and ease of use. No other gas ultrasonic transducer can be extracted under pressure without special tools and with so few parts to remove or touch in the removal process.

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

Instrotech has announced that the Kobold magnetic inductive flowmeters MIM and MIS have been upgraded and further developed as follows:

Kobold MIM, for measuring and monitoring of conductive liquids, is available for nominal sizes, 12-50 mm, and measuring ranges from 15 ml/min to 350 l/min. The new remote version, still manufactured in stainless steel, is designed to withstand temperatures from -40°C to 140°C, and is supplied with a 20 m cable.

The new Kobold MIS is an excellent choice for nominal sizes, above 75 mm, and with a vast variety of linings, electrode materials and flange connections (ISO, ANSI, JIS), the MIS is suitable for most applications.

Both the MIS and MIM are equipped with electronic C3T. Both IO-Link and two independently configurable analog outputs are included with the standard unit, as well as an extensive function package, including flow measuring, counting, dosing, alarm, hotkeys, optical buttons and a rotatable display.

MIM features include:
- Accuracy: 0.8% of reading, 0.5% of full scale.
- Pressure max: 16 bar; temperature max: 140°C.
- Bidirectional measuring.

MIS features include:
- Accuracy: 0.5% of reading, 0.3% of full scale.
- Pressure max: 16 bar; temperature max: 70°C.
- Connection flange DN 80 to DN 100.

For more information contact Instrotech, +27 10 595 1831, sales@instrotech.co.za, www.instrotech.co.za
Under Pressure?
Pressure Sensors for Industry 4.0

User-friendly: access to all sensor parameters via IO-Link 1.1, variable data mapping and NPN/PNP auto detection

Reliable: fully welded metal measuring cell*, integrated pressure peak aperture*, highest vibration and EMC resistance, protection classes IP6K6K/6K7/6K9K  *optional

Simple: Intuitive operating concept via touch display, 180° invertable multi-color display with all-round visible LEDs

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sales@turckbanner.co.za

www.turckbanner.co.za
Industrial networks are growing more and more complex. Powerful industrial networks are no longer defined by hardware alone – the right network management is essential. The Sinec software family offers users scalable software solutions to meet their needs in networks of various sizes in the area of operational technology (OT), from initial commissioning of network components, monitoring, and management to using network services for the necessary infrastructure at a central level.

With the new Sinec software family, Siemens offers a range of functions in the field of network management. The Sinec software family meets the diverse requirements of a modern industrial network and helps users to overcome the challenges of digitalisation, such as the ever-growing number of network devices as well as the security and clarity of increasingly complex networks. Alongside the Sinec NMS (network management system), two additional Sinec tools – Sinec INS and Sinec PNI – offer even more options for comprehensive network management.

The new Sinec INS (infrastructure network services) is a software tool for central network services. It provides customers with a quick and easy overview of all network services via a unified user interface. The tool offers general network services, which specifically benefit OT. Using Sinec INS, the OT can create an autonomous network – independent of IT services – and the network can for example be hosted in an OT data centre. This includes various servers such as DHCP (IP address management), Syslog (collection of events in the network), NTP (time management), Radius (authentication in the network) and TFTP (for firmware updates on network components).

The new Sinec PNI (primary network initialisation) commissioning tool enables the quick and easy initialisation of Scalance and Ruggedcom network components. Controllers can also be initialised. This expansion of the Sinec family portfolio to include the Sinec PNI tool offers convenient basic initialisation and ensures the availability of network components.

Both new tools are ideal additions to the efficient Sinec NMS. The new version V1.0 SP1 of Sinec NMS can also be used to manage security-related aspects in the network. This includes, for example, firewall and NAT (network address translation) management with device-specific rules as well as the policy-based configuration of the network infrastructure and Syslog client. Firewall components can be configured conveniently and efficiently from a central point. Sinec NMS offers a local documentation function via audit trails, which document user activities automatically with a time stamp. This means that audit log entries can be traced without problems. This saves time and effort during investigations and can be used to prove the revision security of data. For further analysis, this audit log information can be forwarded to a central location via the Syslog interface in Sinec NMS (as a Syslog client). In addition, Sinec NMS V1.0 SP1 can be used to centrally monitor, manage and configure tens of thousands of devices in networks of different sizes and with varying segmentation.

Sinec software solutions take industrial networks forward. Users benefit from greater security and convenience in their network management throughout the entire lifecycle and in every industry. As a result, more network components can be managed in less time, which saves both effort and money.

For more information contact Jennifer Naidoo, Siemens Digital Industries, +27 11 652 2795, jennifer.naidoo@siemens.com, www.siemens.co.za
Industrial networks today are no longer air-gapped and immune from cybersecurity threats. Although deploying a firewall and segmenting networks is a good first step, how are OT engineers, who primarily work with industrial protocols and may lack sufficient IT security expertise, supposed to prevent cybersecurity threats from infecting and spreading across networks? After all, the cybersecurity landscape is constantly changing and goes far beyond blocking the spread of worms or unauthorised PLC commands.

Moxa’s industrial cybersecurity solution is specifically designed to secure industrial networks from both an OT and IT perspective to better address the surging market demand for a comprehensive cybersecurity solution for industrial networks. The solution includes critical IT cybersecurity technologies such as an intrusion prevention system (IPS), a key component for defence-in-depth strategies, which has been specifically tailored to protect OT networks from cyber threats without disrupting industrial operations.

How Moxa’s industrial IPS works
Moxa’s industrial IPS features OT-centric deep packet inspection technology, enhances IT network security visibility, and ultimately helps mitigate risks and protects industrial networks from security threats. Deep packet inspection can identify multiple industrial protocols and allow or block specific functions, such as read or write access. Based on the identified protocol, the industrial IPS can then prevent any unauthorised protocols or functions. This way, users can be more confident that the traffic on their industrial networks is trusted and non-malicious. In addition, Moxa’s industrial IPS provides virtual patching of vulnerabilities for operating systems, application software, and industrial equipment such as PLCs. By effectively integrating OT and IT technologies, Moxa’s industrial IPS safeguards critical assets from the latest cybersecurity threats.

In order to ensure that network activity on industrial networks is authorised, Moxa’s industrial cybersecurity solution allows users to define granular access controls at different levels. They can define a whitelist of devices and IP ports that are allowed to access all or part of their entire network. In addition, they can also define the authorised protocol format to prevent unauthorised protocols or functions from passing through the industrial IPS or firewalls. Furthermore, OT engineers can even define which control commands can pass through the network to reduce human error associated with sending a wrong control command. Whitelisting control significantly reduces the likelihood of a DoS attack by OT Trojans.

How to mitigate cyber risks while maintaining system availability
Risk 1: even though a north-south bound firewall has been implemented, unauthorised network access through third parties may still happen. Most serial data communication (proprietary protocols) are not encrypted, leaving the communication unsecured and open to exploitation.
Risk 2: if users do not have a full understanding of their industrial network status, they may not be able to respond quickly or effectively.
Risk 3: leaving unused service ports open may lead to a DoS attack.
Risk 4: unauthorised devices may implant malware into the HMI which then spreads across the network.
Risk 5: most serial data communication protocols are not encrypted, leaving the communication unsecured and open to exploitation.
Risk 6: security patches are not available or feasible for PLCs.

Mitigating such vulnerabilities to secure industrial networks is Moxa’s first priority
IEC-G102-BP series (industrial IPS/IDS)
- Hummingbird-sized industrial security box with IPS/IDS.
- Fine-grained policy enforcement with whitelisting control.
- Bump-in-the-wire installation without impacting the network.

IEF-G9010 series (industrial firewall)
- Compact, security-hardened, and rugged design.
- Fine-grained layer 2 to layer 7 firewall policy with IPS capability.
- Industrial NAT and network segmentation.

Security dashboard console (security management software)
- Centralised cybersecurity management with real-time dashboards.
- OT visibility including device identification and network traffic analyser.
- Automatically deploy virtual patches without disrupting operations.

For more information contact
RJ Connect, +27 11 781 0777
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Cable-type heat sensing systems

Alien Systems & Technologies (AST) offers a wide range of automatic fire detection systems from advanced ultra-smart addressable point-type detection systems to regular conventional systems. It also offers specialised conveyor belt/moving fire black body infrared detectors, along with the ProReact line-type heat sensing cable – otherwise known as linear heat detection (LHD) cable.

Sensing fire conditions using cable
Broadly speaking there are two methods to sense fire conditions using cable. Most commonly used in the South African market is the digital type method: essentially this type of cable looks for a short circuit as a means of triggering an alarm condition. The cable is comprised of two conductors, each surrounded with an insulator that is designed to melt at a certain temperature. Both these conductors are then twisted and remain under torsion. This twisted pair of conductors is then sheathed either in a standard PVC sheath or with options of UV protection (nylon) and/or mechanical protection (stainless steel braid) or chemical resistant (polypropylene) sheaths.

Digital types
The standard digital-type linear heat sensing cable comes in a range of temperature trigger point options from 68°C to 185°C. These cables are known as ‘digital’ because they are ‘off’ below the activation temperature and irreversibly switch ‘on’ when the activation temperature is reached. The primary advantage of using line-type detection is that the mechanism can be spread over an application, bringing it closer to the source of the fire and thereby improving response times over traditional point-type heat detecting devices. The entire linear detection range is UL listed UL521 and FM approved.

A UL approved digital interface monitor module (DIMM) is available to provide accurate alarm location along the LHDC cable, as well as additional benefits when used in conjunction with ProReact Digital LHD cable. The ProReact DIMM is designed to enhance the functionality of existing or new digital LHD systems by monitoring up to two zones. A unique interlock/coincidence detection mode eliminates the possibility of false alarms by requiring both LHD cables to trigger before an alarm is transmitted. A built-in digital display shows the state of each zone, including the exact distance in metres to the alarm point. It also includes an RS-485 Modbus RTU output for integration with a PLC or scada system.

AST also offers specialised digital-type cable of the low smoke zero halogen type. This variant is UV stable with a hydrocarbon resistant coating that minimises the release of smoke and harmful emissions in the event of a fire. The cable is also flame retardant and oil and fuel resistant, ensuring it can be used in harsh environments. Inherent UV stability means it is suitable for indoor and outdoor applications. This cable is also UL/FM approved.

In addition, another variant known as ProReact very high temperature (VHT) digital LHD cable is designed to detect overheating and fires in environments that are normally exposed to extremely high temperatures. The cable has an activation temperature of 230°C and can withstand continuous ambient operating temperatures of up to 170°C. ProReact VHT digital LHD cable is approved in line with UL521 and FM Class 3210 standards and is fully RoHS compliant. It is also used in conjunction with automatic fire extinguishing systems in engine compartments and floating roof tanks.

Analog types
The second method of sensing a fire with cable is to use analog linear heat detection cable. This method continuously responds to changes in temperature and the technology allows the facility to programme an early warning pre-alarm as well as the specified alarm temperature. If the temperature surrounding the ProReact analog LHD cable reaches the pre-alarm point, the control unit triggers a warning, giving the user time to survey the area at risk. Only when the temperature reaches the specified set alarm point will the control unit trigger full alarm. The optional two-stage programmable alarm setting makes this method of overheat detection flexible and ideal for use in a variety of environments and applications. The technology automatically compensates for changes in ambient temperature to maintain the accuracy of the alarm temperature as well as offering up to 500 metres of continuous detection per control unit.

The ProReact analog LHD cable is resettable which means it is not always necessary to replace the cable after an incident. Once the alarm has been triggered, and depending on the severity of the incident, the system can simply be reset with minimum disruption and inconvenience.

Applications for linear heat sensing cable include conveyor belts, in-rack sensing for warehousing storage, both floating roof and fixed roof petrochemical tanks, cold storage areas, tunnels, electrical cable runs, car parks and escalators.
Emerson’s new DataManager software v8.2 helps refiners monitor corrosion of hydrofluoric (HF) acid alkylation units to prevent costly, unplanned shutdowns and maximise profits and productivity. DataManager Analysis Software for Rosemount Wireless Permasense corrosion and erosion monitoring systems offers continuous sensor monitoring that provides early detection of corrosion in HF acid alkylation units and mitigates the risk of loss of containment.

Alkylation units ensure facilities meet gasoline quality specifications and allow for the production of premium gasoline grades, adding significant economic value to the refinery operation. These units are extremely susceptible to aggressive corrosion. Corrosion can lead to an HF release, which may cause significant production loss and place the health and safety of the refinery staff and local community at risk.

Measuring corrosion damage in HF acid alkylation units using traditional methods is difficult. Iron fluoride can scale and build up on the inside of pipes, confusing normal ultrasonic thickness measurements. Additionally, traditional intrusive probes or frequent manual inspections present safety risks due to the hazardous environment of these units. Emerson’s new version of DataManager solves these problems by helping refiners gain a better understanding of the correlation between corrosion rates and upsets or changes in process conditions.

Engineered with a unique new signal processing module, the solution delivers data directly to the engineer’s desk with wireless, non-intrusive sensors that communicate with an Emerson Wireless Gateway, reducing the frequency of manual inspections. These sensors are designed to withstand harsh, potentially high-temperature refinery conditions.

“For today’s refineries require monitoring technology that can safeguard their people and their business,” said Jake Davies, global corrosion product director at Emerson’s Automation Solutions business. “Reducing the risks from HF acid attacks and minimising the potential for leaks allows facilities to better forecast equipment lifespan while also securing the health and safety of their employees.”

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

Rate-of-change types
AST also offers a unique ProReact linear rate-of-change cable sensing system that has been specifically designed to detect liquefied natural gas leaks. The combination of a highly sensitive cable and control unit uses advanced digital signal processing to detect a rapid change in temperature. The nature of its intended application demands that the system is sufficiently robust to withstand a range of hazardous environments. This system is simple to install and designed to integrate into any building management system. It continually adjusts to changes in the surrounding environment to maintain a high level of sensitivity, which eliminates false alarms and guarantees rapid response to an incident. The technology offers a versatility and functionality not readily available in liquid natural gas facilities and is designed to enhance existing detection systems and provide early warning of abnormal situations. The cable is also self-restoring after an incident, allowing the system to be reset rather than replaced. It is qualified for use in hazardous areas (ATEX/IECEX zones 0, 1 and 2; Gas Group IIC; T Class T5).

For more information contact Alien Systems & Technologies, +27 11 949 1157, sales@astafrica.com, www.astafrica.com

Emerson’s software secures health and safety
Simply safe in the IoT environment

The RFC 4072S Remote Field Controller is the highest performance device in the Phoenix Contact controller portfolio. The PLC is ideal for use as a central controller, in particular in computation-intensive applications with the highest safety-related requirement levels SIL 3 and PL d. It also features time-deterministic processing of IEC 61131 and high-level language programs as well as Matlab Simulink models.

From a technical perspective, the RFC 4072S is a combination of an operational and safety-related controller. The operational controller processes the standard application and is responsible for data transmission with the standard I/Os via the Profinet protocol. The safety PLC runs the safety-related program and communicates via F-host instance. This makes it possible to operate up to 300 subordinate F devices in the PROFIsafe network. The RFC 4072S supports the latest PROFIsafe profile V 2.6.1, which means it can be used to control the latest F devices.

Combined use of different programming languages
With PLCnext Technology, Phoenix Contact provides an open ecosystem for current and future automation requirements that allows for the convergence of automation tasks and IoT demands. In addition to the PLCnext controller, the ecosystem comprises the modular software platform PLCnext Engineer, the digital marketplace PLCnext Store, the PLCnext Community, and the option for systemic cloud integration. The specially developed firmware architecture allows the user to use IEC61131 programming languages in combination with high-level languages, such as C++ or C#, or a control algorithm model in Matlab Simulink. A control program can consist of just one or any combination of the languages specified above.

When processing high-level language programs in industrial control systems, the challenge lies in the fact that the code does not have a force-guided cycle. As a solution, PLCnext technology offers a middleware between the operating system and the user level. This approach involves the scheduler, which is referred to as the execution and synchronisation manager (ESM). The ESM ensures that, for example, programs written in C++ or C# can be executed in models generated by Matlab Simulink as well as applications created in accordance with IEC 61131-3 in a defined and time-deterministic sequence. On the other hand, a smart shared memory – Global Data Space (GDS) – ensures a cycle-consistent data transfer between the various programs and the I/O level.

As a further component of the ecosystem, the PLCnext Store offers finished, pre-programmed software applications (apps) that can be run directly on the RFC 4072S. The different apps are not only offered by Phoenix Contact, but also by third-party providers.

Shorter program runtime
The PLCnext technology functions as the firmware of the operational controller of the RFC 4072S. The firmware architecture makes it possible for code on the Intel i5 dual-core processor that was created using different programming languages to be freely assigned to core 1 or core 2. Compared to a single-core system, this unbundling offers the following advantages for the user application created in IEC 61131-3, high-level language or Matlab Simulink: shorter program runtimes and reduced variance compared to the average runtime. This is because, for example, programs with different priorities and longer processing times are not interrupted when they are executed on different cores.

If the use of safety-related components is required, the RFC 4072S can, for example, be used to control a wind turbine. One specific field of application is adjusting the wind turbine rotor blades. As part of this pitch control system, the current rotor blade position can be detected and, for example, transmitted to an RFC 4072S. The set-point of the rotor blade position is calculated based, among other things, on the failsafe detection of the prevailing wind speed via an anemometer, which is then processed in the safety program of the remote field.
controller. If the wind speed exceeds a critical value in a short period of time, for example due to a gust of wind, the safety-related controller sends the signal to turn the rotor blades out of the wind. However, if the measured wind speed is in the permitted range, the data is evaluated in the operational controller.

Further processing of recorded data
The operational control PLC uses the current value of the wind speed in a program in accordance with IEC 61131-3 and visualises it as a percentage of the permitted nominal value for diagnostic purposes. Next, the value is processed in a Matlab Simulink model. The user receives the orientation of the nacelle and the position of the rotor blade for optimal energy generation as set-point values. In order to determine the absolute target position of the rotor blade, a program created using C++ converts the absolute values to a control signal for the positioning motor. The converted value is then compared to the current actual value and, if the two values are not identical, the new set-point is communicated to the positioning motors via a fieldbus system.

The wind speed can be sent to the Proficloud for statistical purposes. Here, the data can be stored in a log, processed, and visualised as a sequence of time. Because the wind turbines can be installed in different regions, the wind speed as well as the resulting energy generated can be merged centrally in Proficloud. Recording values is simple: When a program is set up, the user only needs to add an additional check mark for the RFC 4072S in order to transmit the variable to Proficloud.

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

Next level light curtains
SICK Automation is a world leading manufacturer of sensors, safety systems and automatic identification products. The next step for safety – this core idea therefore underpins the entire design of the deTec4 safety light curtain from SICK.

Safety light curtains for the prevention of machine accidents are a readily available technology; but users of this technology want more than just safety. They are looking for intelligent additional functions that generate added value in terms of process transparency, flexibility, ease of use and maintainability, or integrated automation functions that guarantee fast amortisation and maximum future proofing.

The key details in brief include protective field heights of 300 mm to 2100 mm; performance level-E safety rating in accordance with EN ISO 13849; SIL3 in accordance with IEC 61508 and type 4 in accordance with IEC EN 61496-1; reduced resolution mode; beam coding; 2-signal muting; IP65 and IP67 protection class; and high temperature resistance from -30 to 55°C.

Of much greater interest are the modular functional scope and innovative features of the deTec4, which no other safety light curtain currently offers in this combination. Thanks to Smart Presence Detection, the deTec4 from SICK only activates presence detection if a person is actually in danger. In contrast to conventional safety light curtains, the deTec4 can reliably blank out sawdust and weld sparks that fall into its protective field, while securely protecting people at the same time. This reduces unplanned downtime and machine failures and increases the productivity of machines and plants.

Equally user-friendly, but significantly more extensive are the diagnostic options via NFS and the SICK Safety Assistant smartphone app. While NFC and the smartphone app facilitate real-time diagnostics and rapid troubleshooting on site by taking a snapshot, sensor communication via IO-Link provides for continuous remote diagnostic data, as well as comprehensive data analysis and visualisation in the SOPAS Engineering Tool. This helps with the systematic troubleshooting of causes in the event of a fault, as well as with quickly restoring the sensor function and operational readiness of the machine. Finally, the communication via IO-Link makes it possible to use the data from the deTec4 for additional measurement and automation functions.

Safety light curtains reliably and cost-effectively protect against access into hazardous points and areas. SICK Automation takes safety to the next level.

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

HYDROGEN DETECTORS
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The African Hydrogen Partnership Conference attracts interest

In the context of carbon emissions and the need for green energy, the first African Hydrogen Partnership (AHP) Conference was held from 19-20 February at the United Nations Conference Centre in Addis Ababa. The AHP is the initiative of Siggi Huegemann and Vincent Oldenbroek and is aimed at the establishment of an AHP Trade Association, which will draw on the skills and energies of both trade and academic organisations to establish and develop the generation and use of hydrogen as an energy source throughout Africa.

The proceedings were opened by Huegemann and Oldenbroek who gave brief explanations of the intent and objectives of AHP. These include the establishment of a trade association that will have the stated organisation and character of a multinational, multicontinental organisation of public and private entities without regional or national restrictions.

The scope, quality and range of the subsequent presentations was impressive and ranged, from descriptions of ‘Japan’s path towards the hydrogen economy’ to a discussion why French company Engie supports the creation of an African Hydrogen Association. Of particular interest to South Africa was a presentation by Fahmida Smith from Anglo American, who discussed ‘Reimagining mining through hydrogen’. There is already a pilot project under way to power ore haulers at an Anglo mine in South Africa with hydrogen.

The first milestone will be the AHP annual general meeting (AGM) scheduled for May 2020 where the goal will be to formally establish the AHP in Africa. [Due to restrictions imposed by the coronavirus pandemic, the AGM will now be held as a virtual meeting.] The second milestone will be the commencement of operations of the newly established AHP Association scheduled for September 2020.

The AHP will enable member companies to exchange views and ideas on economic, technical and other relevant social topics, including the treatment of political, general legal and tax issues on a pan-African basis. It will enable these companies to communicate with the public, governments and administrative bodies with one voice. The association will be open to African and non-African member companies, and will be based in Mauritius, which offers a well-established legal system and is subject to the laws of the United Kingdom.

Interested parties should visit www.afr-h2-p.com

For more information contact Catherine Scholtz, RTS Africa Technologies, +27 12 433 6335, catherine@rtsafrica.co.za, www.rtsafrica.co.za

Extech announces new i.safe Mobile devices

Extech Safety Systems has announced the introduction of two new mobile devices – IS530.1 and IS930.1 – both IA certified for South Africa including Ex ia Ma zone 0 for underground coal mining.

IS530.1
This innovative Zone 1/Cl I Div1 smartphone incorporates the most advanced technology. It is a Bluetooth 5.0 enabled industrial smartphone with multifunctional ISM interface, a large internal memory (64 GB) and the highest camera resolution of its class.

Other features include: AndroidTM 9.0; 4G (LTE); 4.5” (11.43 cm) Gorilla Glass 3 display; quick charge with magnetic charging port; universal, lateral ISM interface; PTT ready (third-party application provided); and usability while wearing gloves.

IS930.1
The IS930.1 is a tablet device for use in ATEX Zones 1/21 and 1/Cl I Div1. This 8” device is highly robust, powerful and offers many technical advantages such as 8400 mAh battery; Qualcomm Snapdragon SDM 660; and Android 9.0. Other features include: near field communication; 8” (20.32 cm) F HD RugDisplay glass; multi capacitive touchscreen; LWP ready (application of another provider needed); push to talk (application of another provider needed); dust- and waterproof (IP68); 2 cameras (13 MP rear and 5 MP front); Wi-Fi IEEE 802.11 b/g/n; Bluetooth 5.0; MicroSD-card slot up to 128 GB; and long battery life (8400 mAh).

For more information contact Gary Friend, Extech Safety Systems, +27 11 791 6000, sales@extech.co.za, www.extech.co.za
Remote alarm monitoring made simple

The new multifunction four-wire transmitter Jumo dTrans T06 Ex in DIN rail housing is ideal for demanding SIL and Ex applications. The measurement input has a 22-bit resolution with switchable noise suppression and works with extreme precision. The SIL option meets the requirements for SIL 2/SIL3 according to DIN EN 61508 and PL c and PL d to DIN EN ISO 13849. In addition, the Ex device fulfils the ATEX and IECEx requirements up to Zone 0.

A particularly high electrical isolation guarantees excellent signal stability even under difficult measuring conditions. The intuitive operation is carried out via four buttons and an LC display, which can also be used to display information about the measuring point. The safe SIL configuration is supported by a convenient setup program. As a special feature, a configuration-related connection diagram can be called up on the device's display.

Transmitter for Ex applications

Alarms are normally managed on site by personnel charged with supervising the plant/facility and ensuring the continuity of the operation. Alarms are implemented to help manage operations and mobilise resources in order to return the operation to normal operational conditions after a fault has occurred.

Combining the power of remote terminal units (RTUs) and cloud-based server technology allows Omniflex to manage alarm annunciators remotely via Web-based technology. An RTU is used to communicate with the alarm annunciators using Modbus serial communications (up to 15 units – 240 alarms). The alarm status is transmitted via GSM to the Data2Desktop cloud-based servers, providing user access from any internet browser and effectively allowing the alarm systems on site to be monitored and managed remotely. The system has the following key features:

- Supports up to 15 annunciators on a single serial port.
- Allows users to enter a manned mode or unmanned status mode.
- Programmable Teleterm units in PLC language IEC61131 for local automation functions.
- Auxiliary inputs or outputs for control.
- Compact self-contained Teleterm gateway.
- Battery backup for power interruptions.
- Independent of on-site Internet connections.

System benefits

- Easy installation.
- Configurable and easy customisation.
- Wireless connection with global access.
- Low-power operation (battery backed).
- Alarm logging.
- Automated reporting for management.
- Maintenance: staff mobilisation via alerts.

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

Remote alarm monitoring made simple

The DTtrans T06 Ex can be used with resistance thermometers and thermocouples as well as with WFG/potentiometers and voltage/current signals. It converts these input signals into an output signal, 0-10 V or 4-20 mA. The universal measuring input with 22-bit resolution ensures the highest measuring precision with the DTtrans T06 Ex.

The compact mounting rail housing with an overall width of only 22.5 mm, as well as coded plug-in terminals, enables quick installation in control cabinets and safe exchange during required calibration and maintenance work. All the important transmitter information can be queried and visualised via an RS-485 interface.

For more information contact Ian Loudon, Omniflex, +27 31 207 7466, sales@omniflex.com, www.omniflex.com

www.instrumentation.co.za May 2020 35
Parker Hannifin has extended its Phastite permanent instrumentation connection range, which is now available in a number of corrosion-resistant alloys (CRAs), including Alloy 825, 625 and Super Duplex, and in new larger sizes to suit even more applications for the oil and gas industry. Phastite is an innovative push-fit permanent instrumentation connection that eliminates the need for welding tubes up to 2.5 cm, providing permanent non-welded leak-free connections.

“We’re extending our Phastite range with a number of new corrosion-resistant alloys up to 2.5 cm in size in response to market demand,” says product manager, Franck Grignola. “Contractors and engineers in many industries recognise how Phastite offers quick and simple installation, with no need for ‘hot work’ permits and without a requirement for non-destructive testing. By extending the range with CRAs, we are opening up the connection for an even wider range of applications.”

To make a joint, all that is required is to slide the fitting onto the tube end, and then push the collar along the fitting body until it reaches a dead stop. With the help of a hand tool, the connection can be installed in under one minute, whilst assuring users of right-first-time connections.

Phastite is renowned for enhancing safety as it eliminates the need for welding work that could be hazardous in certain applications. Fabrication times with Phastite are much reduced with connections typically completed within minutes, rather than the hours required for welding. The innovative connection has also proved extremely popular as it eliminates the need for post-welding inspection and the cost of non-destructive examinations (NDE).

As a versatile system, Phastite is well suited for hydraulic, water and water/glycol, lubrication and other media. It is able to withstand pressure up to 1380 bar and is designed to perform at subsea depths of 5000 metres. Phastite meets the requirements of ASME B31.1 and B31.3 and has been tested in accordance with ASTM F1387. The connection is designed to provide optimum performance as it reduces inspection/cooling time as well as pipe repair downtime. It also eliminates weld-induced corrosion and mechanical stresses. Ultimately it offers a clean and safe assembly.

Phastite features an innovative design with built-in pipe tolerance control and metal-to-metal sealing. It is available in a broad range of configurations and provides a clean assembly process, requiring no lubrication. Phastite meets all the relevant performance and functional requirements of industry standards, including pressure containment to a safety factor of a minimum of 4:1, proven by actual tubing burst tests. It has been proven in rigorous tests including thermal cycling, shock, vibration, helium leak, gas tight and hydrostatic testing and has been widely used in both onshore and offshore oil and gas, petrochemical and chemical applications for a number of years.

Phastite has been granted Type Approval by DNV. DNV Type Approval provides unbiased, third-party verification of a product’s conformity to the producer’s specification and relevant national and international standards, and is based on a design assessment and an agreed programme of performance testing, to demonstrate the product’s suitability for use in general marine, offshore and industrial piping systems.

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

Datalogic has the best technology and specifications, and provides the widest range of Magnetic, Inductive, Capacitive and Photoelectric Sensors for universal and application specific purposes, such as colour, contrast and luminescence sensors, fork sensors for label detection, as well as encoders and devices for dimensional and distance measurement.

Datalogic also offers a complete line of Type 2 and Type 4 Safety Light Curtains, Control Units and Safety Relays for machine safeguarding and access control in dangerous areas, with basic and advanced functions, such as integrated muting, override, blanking, cascading and configurable models.

When you think process control and automation solutions ...

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http://acdcensorselector.acdc.co.za
Miniature photoelectric sensor

The DQ12 is a miniature, cost-effective solution for applications in space-constrained environments. The sensor features LED status indicators for power on, signal received, and marginal signal. In addition, fixed field models are now resistant to ambient light interference, for example from energy-efficient lights.

Increased sensing range with new LED technology
The DQ12 is available in opposed mode, fixed-field, polarised retro reflective, and non-polarised retro reflective modes. They all deliver powerful sensing performance in tight spaces. Opposed-mode and retro reflective models feature increased sensing range for greater application distances, or higher reliability due to increased light output. The excess gain and other performance specifications are very similar to the Q12 Series, while the DQ12 sensor’s compact 8 mm housing can fit almost anywhere.

The housing is rated IP67 for use in a wide range of locations and applications. The sensor features an over-moulded housing with highly visible pad printing for enhanced durability. It mounts directly or inside manufacturing equipment, with robust, metal-lined mounting holes consistently located on all models.

The sensor is also available in light operate (LO) or dark operate (DO), bipolar or complementary outputs, with a full range of cable and connectors depending on the model.

Applications
The sensor is easy to install, mounting directly to equipment via robust metal-lined mounting holes. The DQ12 is rated to IP67 for use in a wide range of locations and applications, including:
- Error-proofing in automotive assembly equipment.
- Embedded in automated commercial kiosks and benchtop laboratory equipment.
- End effector sensing on robotic assembly equipment.
- Part-in-place verification for many industries such as smartphone manufacturing and semiconductor packaging.

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

Covid-19 early detection strategy

Instrotech would like to make it known that it has a specialised early detection system on offer, that allows for fast, non-contact screening and identification of school learners, tertiary students and staff who may be displaying the early signs and symptoms of Covid-19 viral infection, specifically the diagnostic high fever in individuals.

Learning institutions that wish to make use of thermal temperature scanning should ensure that the instruments to be used for fever screening are appropriate for the task, and perhaps more importantly, that operators be fully trained in their correct use, to minimise possible operational inaccuracies. It is also crucially important that the instrument used is recently calibrated and that it has an accuracy or repeatability function of within 1%. Once learners and staff have been scanned, those individuals flagged as ‘feverish’ should be sent for a secondary contact screening.

The Optris Xi400 infrared camera and its extensive software package are purpose designed for fever inspection. The software highlights individuals whose skin temperature exceeds the predefined value. A visual alarm alerts operators to identify and possibly isolate these individuals, so that further examinations can be carried out. If required, the software also offers an automatic IR image snapshot, when the alarm is tripped.

Installation of the Optris system – the Xi400 infrared camera and its extensive software package – is easy and password protected to prevent unauthorised access. A reference radiator, built into the infrared camera, allows automatic and constant IR calibration of the camera itself. The temperature resolution of 0,1°C detects the smallest of temperature variances.

For more information contact Instrotech, +27 10 595 1831, sales@instrotech.co.za, www.instrotech.co.za
The TwinCAT 3 Lighting Solution, which is easy and convenient to configure via Excel files, simplifies all work steps from engineering to maintenance. All typical lighting controls are integrated in the system, and the number of DALI (direct addressable lighting interface) lines is unlimited. Fast functional changes, address changes, system expansions or cross-DALI line groupings can be carried out without operating interruptions. In addition, daylight-dependent human centric lighting concepts can also be implemented.

With the addition of the TwinCAT 3 Lighting Solution (TF8050), Beckhoff has extended its product range for the automation of commercial and public buildings with a DALI-2 lighting control system. The solution can be used to suit every lighting situation in large office buildings or production halls. It not only includes a comprehensive, complete range of functions, but rather also the consistent simplification of all work steps and control options. Moreover, the TwinCAT 3 Lighting Solution is fully Web and HTML-capable, scalable and can be operated conveniently via panels and mobile end devices such as tablets, for example.

The broad range of applications includes motion and presence-dependent lighting control, daylight-dependent lighting control, and management of lighting scenarios and control of dynamic light sequences based on the natural course of daylight for human centric lighting (HCL) concepts. In addition, monitoring of energy and status data can be used for optional location-independent data analysis, while engineering is simplified considerably as there is no restriction on the number of DALI lines, cross-DALI line groupings can be carried out and all typical lighting controls are available. The TwinCAT 3 Lighting Solution supports the implementation of HCL in particular through the integrated colour temperature setting function, freely adjustable colour temperature and dimming function curves, lighting control optionally via start/stop time or sunrise/sunset, as well as full compliance with the DALI DT8 standard.

The lighting solution is made even easier to use through modular and conveniently scalable hardware options. As a fully configured plug-and-play version, the solution includes either a 7-inch multitouch CP6606 or CP6706 panel PC, or a CX51x0 or CX9020 embedded PC. In addition, the I/O level with bus couplers and bus terminals can be easily adapted to individual application requirements.

For more information contact Dane Potter, Beckhoff Automation, +27 79 493 2286, dane@beckhoff.com, www.beckhoff.co.za

The efficient and easy to configure DALI-2 lighting solution

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IO-Link through to the cloud

The smart combination of the IO-Link sensor interface and the OPC UA communication protocol in a single device gives Pepperl+Fuchs new opportunities to offer complete, seamless, and transparent communication ‘from the sensor to the cloud’.

Continuous data communication from the lowest sensor/actuator level to the cloud is becoming increasingly important across the entire industrial environment. For the logistics sector in particular, where adherence to deadlines is a key requirement, it is essential to know where packages are located, how long processing will take, and where potential plant malfunctions can lead to delays.

The IO-Link sensor interface represents the first step toward this level of transparency. In addition to process data from the sensor, IO-Link provides information for identifying, configuring parameters for, and diagnosing the sensor. Combining IO-Link and OPC UA now allows this data to be easily transferred to higher-level computer- or cloud-based systems. This is the second and most decisive step toward complete data transparency since the data is accessible beyond the central control system. Decision-makers can now access the data without the need for complex workarounds. Pepperl+Fuchs has combined IO-Link and OPC UA in one device, thus creating new opportunities for the digital future of its customers.

For more information contact Pepperl+Fuchs, +27 87 985 0797, info@za.pepperl-fuchs.com, www.pepperl-fuchs.co.za
Over the years I have had many requests to write a book giving more detailed explanations of some of the problems I have encountered in my work on practical loop optimisation. I am by nature and inclination an engineer and not a writer, and so have shied away from such a formidable task. Also the publishers of my articles have informed me that they believe that the book would cost more to produce than it would earn, as there is a relatively limited market for such a work. I also believe that people learn far more, and even more importantly, would gain much better understanding of the subject by actually attending my courses where things are demonstrated by doing exercises on a powerful simulation package, rather than trying to read it up in a book. However some past delegates have not had the time and/or opportunity to practice what they learnt and soon forgot much of the course. Many of them have also requested me to put out a book. To try and meet these requests in a different way, I intend to publish some of the information dealt with in my courses in this series of Loop articles. Initially the articles will only deal with some of the basics concerning problems and faults commonly encountered in feedback control loops. They will be published under the general heading of ‘Loop Signatures’. It should be noted that many of the things that will appear in these articles may have appeared and been discussed in previous Case History articles dealing with loops in various plants, but the approach here will be to systematically categorise the problems in a more logical approach.

A review of basic terminology
To kick off the series and to avoid having to redefine terminology every time, I will deal with some basic fundamentals about the feedback loop in this article, and also establish the terminology and names that will be used throughout the series. It is therefore advised to keep this for future reference.

At the outset it should be noted that there are no universal standards and definitions when it comes to industrial instrumentation and control. The industry has been largely led by the large manufacturers, who generally use their own terminology and definitions. In fact, many of them publish the definitions of all the terms they use in their specifications. Thus it is really important that users are aware of this as one manufacturer may have a different definition of a common term (such as the term ‘accuracy’ for example), to another manufacturer. It is really a case of ‘let the buyer beware’.

You will therefore appreciate that the terms and names that will be used in these articles may, and most probably will, not be the same as those that your instrument manufacturer uses, or which you yourself are familiar with.

Figure 1 shows a simple feedback control loop. The loop consists of:

- A measuring device with associated transmitter that converts the signal to a 4-20 mA or digital signal, which is suitable for transmission back to the control room.
- A final control element, which is often simply called the ‘valve’, even though in actuality it could be any one of a numerous range of devices including dampers, variable speed drives (typically powering pumps, fans or belts, louvers, governors and heating appliances), or an actual control valve. Although not shown in the figure, the final control element may, and often does, include a current-to-pneumatic (I/P) converter, and a valve positioner.
- A controller.
- Finally, the process itself forms an integral and important component of the loop.

From the control point of view, however, the process consists of everything external to the controller including the measuring device, transmitter, valve, piping, etc. This is shown in Figure 1 as the ‘process boundary’.

The signal from the transmitter to the controller will be referred to as the ‘process variable’ (PV), and the signal from the controller to the final control element as the ‘process demand’ (PD). It should be noted that the PV, which is one of the input signals to the controller, represents what is happening on the output of the process, whilst the PD, which is the output signal from the controller, represents what is happening on the input...
to the process. This sometimes confuses people, but it will be clear once you realise that the controller is effectively in parallel with the process.

The controller itself, in its simplest form, has two inputs. One is called the ‘setpoint’ (SP), which is the value at which you would like to control the process, and the other is the PV which is the actual value of the process. The controller’s operation will be discussed in detail in future articles. For the present, it is important to know that as a general rule, the first thing that a controller does is to subtract the one signal from the other, i.e., SP – PV, this difference will be called the ‘error’.

If a process is on setpoint, and is stable, and an error then arises, it will be because either the setpoint, or the PV has changed. The former is referred to as a ‘setpoint change’ and the latter as a ‘load change’. Load changes are normally caused by external factors that affect the process.

Calculating the error
Again in very general terms, in most control loops, the purpose of the controller is to try and keep the error to an absolute minimum. Therefore, the best method to determine the effectiveness of a control loop is to calculate the error over a period of time. This will be referred to as ‘control variance’. In reality there are many ways of calculating control variance. For example, one could integrate the error over a period of time (say one 8-hour shift). However, probably the most commonly used modern method is the use of statistical calculations. The error is sampled at regular intervals (commonly at the controller scan rate). The samples are then statistically analysed at longer intervals. The statistical standard deviation gives a good representation of the variance, and is a practice commonly employed in paper manufacture where ‘2 x Standard Deviation’ (commonly referred to as ‘2 x Sigma’), is used as a measure of the effectiveness of the moisture and basis weight controls on each roll of paper.

Open and closed loop control
When operators make changes in manual, they adjust the PD directly, as can be seen in Figure 2.

When working in automatic, the controller looks at the error signal, and then solves a mathematical equation. The result of the calculation sets the magnitude of the PD signal. The valve then moves to the position as dictated by the PD, which adjusts the amount of whatever is going into the process. The process then reacts accordingly, which in turn changes the value of the PV. This changes the error, and the controller will then recalculate the PD, and so on. Thus this sequence is effectively going round and round the loop on a regular basis, depending on how often the controller does its calculation, which on most modern controllers is once per second.

As can be seen in Figure 3, if the control system works efficiently, it would obviously be much easier for the operator to set the desired value of the setpoint on the controller, and let the controller perform all the work of getting the PV to the right value, and keeping it there, rather than for him (or her) having to do it all manually. Unfortunately it is a very sad fact of life that due to the almost complete lack of training (and hence understanding), of field practical control, the vast majority of loops are set up so badly that operators generally make most changes in manual rather than in automatic. In fact, they usually only leave controllers in automatic when the plant is running under steady state, where of course, the controllers are generally doing very little.

Control in automatic is often referred to as ‘closed loop control’ and manual as ‘open loop control’.

Test equipment
It should be noted that to optimise control loops, one must use, at the very minimum, a high-speed, high-resolution, multi-channel recorder. A proper loop analyser like the Protuner, which is specifically designed for optimisation work, makes the task much easier. It should be noted that the ‘tools’ provided on control equipment like DCS and scada systems is generally completely inadequate for optimisation, particularly for fast processes.

The recorder, or analyser, is connected to the process across the controller’s input and output (PV and PD signals). Most tests are performed by making changes on the controller either in automatic (closed loop tests), or in manual (open loop tests).

The next article will deal with the two classes of processes’ essential to understand practical process control.
Torque has to be measured in both production and assembly, and again in quality control. Burster, a precision measurement technology specialist, offers a range of sensors for the smallest torques of a few tenths of one Nm, such as required for quality assurance of rotary switches, all the way up to torques of 1000 Nm for testing engines.

The model 8661 is available, for example, in different sizes, beginning with sensitive measurements of 0 to 0.02 Nm to determine a breakaway or friction torque at speeds up to 25 000 rpm. The largest size can measure up to 1000 Nm, which makes it suitable for performance testing of large engines and gearboxes. Common to all measuring ranges is an ultra-low linearity deviation of less than 0.05% of full scale.

Burster also offers solutions for special tasks, including dual range sensor models with high precision in both measurement ranges. For example, this means that a low steady-state load torque can also be measured with the best possible accuracy on test specimens that have a high starting torque. The robust construction of the sensors and optional features such as tare function, or filter and average value settings, can open up further applications including in price-sensitive or difficult conditions.

Burster can carry out individual modifications to both the mechanics and the electronics to meet special OEM requirements. A mounting block simplifies alignment so it is easy to change the sensor frequently. The measured values – torque plus angle and speed measurement, depending on the model – are output as an analog signal (0-10 V DC). The DigiVision software allows up to 1000 measurements/sec to be read out, displayed graphically, and stored. Alternatively, drivers are available for integration into LabView, DASYLab or proprietary software. With Digiforce process control units, measurement programmes for various processes can be implemented flexibly. All torque sensors can be supplied with DAkkS/WKS calibration certificates.

Represented in South Africa by ASSTech, Burster is a German manufacturer of measuring instruments and testers as well as standard sensors for mechanical and electrical measured values. These products are used throughout the world by customers in mechanical and plant engineering, automation, the automotive industry and allied suppliers, electrical and electronic engineering and the chemical industry.

For more information contact Anastas Schnippenkotter, ASSTech Process Electronics & Instrumentation, +27 11 708 9200, info@asstech.co.za, www.asstech.co.za
The DeltaV PK Controller brings faster logic execution, built-in native Ethernet device protocols, and many scalable sizes, enabling it to address a wide variety of applications such as Ethernet device control, wellpads, and a wide variety of system sizes. From small-scale applications like skid-units, to your large-scale traditional control operations, the multi-purpose, multi-functional controller can handle your toughest demands no matter the size or stage of your operation.

Features
- Runs standalone or as part of a DeltaV system
- Seamlessly merge into a DeltaV system resulting in one native database and system
- Eliminates the cost and time-consuming data mapping exercises
- Saves cabinet space by leveraging the six built-in Ethernet ports
- Supports 1:1 redundancy without adding footprint or configuration changes
- Flexible I/O enables you to choose from M-series traditional, S-series traditional Charms I/O Card and Wireless I/O cards to best suit your needs
- Integrated safety with DeltaV SIS Electronic Marshalling and DeltaV SIS 1508 Safety Logic Solver
AEL (African Explosives Ltd.) Intelligent Blasting’s nitric acid plant saves R3.6 million on annual operating costs thanks to an upgrade from direct-on-line operation to VLT drive control of electric pumps and motors.

The AEL Intelligent Blasting nitric acid plant in Johannesburg supplies other AEL divisions serving mining operations with chemicals and explosives, nationally and internationally. The nitric acid plant has improved its reliability by upgrading the process water cooling system, and reduced energy consumption by 500 kWh hourly in the process.

For many years, motors and pumps in the process cooling water (PCW) system operated direct-on-line. With the upgrade, AEL Intelligent Blasting aimed to improve efficiency and reliability by introducing AC drive motor control. It chose VLT AQUA Drive FC 202 and VLT HVAC Drive FC 102 drives from Danfoss, based on their ability to ensure stable operation despite unreliable mains power supply. These drives offer automatic energy optimisation and kinetic backup features to support highly efficient and reliable plant operation.

During the upgrade, there was no disruption of operations as pre-installation of all equipment was performed with wires run to and from the motor control centre. The final connections were made during a planned shutdown for a catalyst change-out.

Variable speed control with fast payback time

Since the upgrade, AEL Mining Services has been able to reduce the electricity consumption from the two fans by 200 kWh combined and by another 300 kWh on the pump motors. The total savings on operating costs based on an average electricity charge of 85 c/kWh, is roughly \((200 + 300) \times 8560 \text{ hr} \times 0.85 = R3.6\) million.

The remarkable payback time of only 18 months reflects the vast improvement in process cooling water efficiency enjoyed by AEL Intelligent Blasting.

Zest adds geared motors to product range

A range of WEG geared motors with benefits including efficiency and reliability will soon be available to customers in South Africa and the rest of the continent from Zest WEG. According to national sales executive Johan van Niekerk, the WEG WG20 range is a natural extension of the company’s offering in electric motors, and will be available from the third quarter of 2020. The geared motors will be distributed and supported through Zest WEG’s established footprint of strategically located branches and outlets across the continent.

“In keeping with our local production philosophy, and to reduce lead times to customers, the geared units will be assembled in South Africa,” he adds. “Zest WEG has made a substantial investment in new assembly facilities, including hydraulic presses and assembly tooling. The geared motors will allow us to expand our services into new markets including the packaging, recycling, and food and beverage sectors.”

“Local assembly allows reduced time-to-market,” highlights Zest WEG geared motor specialist, Cas de Jager. “Underpinning our quick turnaround time will be our skilled employees and local stockholding of a full range of gears, flanges, housings, shafts, bearings, oil seals and other components.”

The components for the geared motors are manufactured by Watt Drive in Austria, an established gear technology specialist and part of the global WEG group. Watt Drive offers a complete range of combinable drive systems for production machines and industrial manufacturing plants. In addition to providing high-quality components, the company is also training Zest WEG personnel at its Austrian facility, and will regularly send technical experts to continue building capacity in the South African operation.

“There are various benefits inherent to geared motors,” explains de Jager. “A key improvement delivered by geared motors is their high level of efficiency. Only about 1.5% of mechanical efficiency is lost per gear stage, so a two-stage gear unit would be about 97% efficient. They are also reliable, robust and durable, making them economical to maintain.”

Van Niekerk says Zest WEG’s extensive footprint around South Africa positions the company well to introduce the WEG WG20 range to new and existing markets.

“Our geared motors will be given by the high levels of service and after-market support for which we are well known,” he concludes.

For more information contact Lynne McCarthy, Danfoss, +27 11 785 7628, mccarthy@danfoss.com, www.danfoss.co.za

For more information contact Zest WEG Group, +27 11 723 6000, info@zestweg.com, www.zestweg.com
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SEW-Eurodrive solution for new brick and block plant

SEW-Eurodrive's HandlingKinematics application module allows for machine control at a higher level by means of a lower-level configurable control unit (CCU) for carrying out precision path movements. During start-up, all the end user is required to do is enter the relevant mechanical data for the initial configuration of the motion parameters.

During production, the trajectory positions necessary for commencing movement are simply transferred to the CCU, which coordinates the path movement in real time. It even allows for ‘wait’ points to be defined in the trajectory. The system is so flexible that, during palletising and stacking, the target position can be adapted immediately during the runtime by the CCU, without higher-level controller intervention.

Even greater flexibility can be allowed for by incorporating the freely programmable Movi-PLC in the HandlingKinematics application module. This provides for exactly the same functionality, and completely repeatable configuration. While the hardware is the same, the only extra element needed is a different memory card for the programmable MultiMotion software, which ensures unlimited consistency.

Engineer Dylan Enslin explains that the pick-and-place solution from SEW-Eurodrive is essential for bricks or concrete blocks to be palletised in cube-sized packages for easy transport. Bricks or blocks are manufactured, compacted on a vibrating screen, placed on steel or wooden boards, and stacked in a curing chamber for three days, during which time a high humidity is maintained to crystallise the cement.

Thereafter a de-stacker feeds the boards onto a conveyor belt, which is where the pick-and-place application comes into play. Shaving even a single second from this process can translate into a massive increase in the daily production rate. The actual pick-and-place machine itself is robotic, which is not supplied by SEW-Eurodrive as an off-the-shelf unit. Instead, it supplies a retrofit kit that includes geared motors, cables, inverter, VSDs, and the software.

Pick-and-place robotics is based on kinematics: mathematical models used to control and coordinate multiple axes. The machine developed by the OEM is essentially an automated gantry system, with an upper-level controller to send the relevant coordinate data. The distance involved during the pick-and-place process is about 4 m, with a 2-3 m lift. The rotation and clamping of the gripper is controlled by a combination of pneumatics and servo motors.

SEW-Eurodrive has been working intensively with the OEM for about two years to refine its latest upgraded equipment. A specific recommendation, for example, was to use a combination of high-flex and standard cabling, as the cabling is subjected to a lot of bending. This saves costs, as well as increasing the durability of the system. Other factors that had to be taken into account were the motor mountings, as the oil levels had to be correct and all the necessary oil seals in place.

“From the initial designs, we actually ended up with a unit smaller than envisaged initially, due to us refining the calculations provided by the client,” concludes Enslin. “The smaller the unit, the more cost-effective it is. Such has been the close working relationship established with the OEM that they have already collaborated on an improved vibrating screen.

“There are global companies manufacturing similar equipment, but our customer wanted to design and build its own unique version, compatible with local operating conditions and requirements. A standout feature of the equipment is the application of servo technology. The fact that we have been able to supply it with the latest advances in this field positions us firmly as a complete solutions provider for our customers in a range of industries.”

For more information contact Jana Klut, SEW-Eurodrive, +27 11 248 7000, jklut@sew.co.za, www.sew-eurodrive.co.za
For the first time we bring together our core global motion control technologies in a single unifying force. Through insight, intelligence and innovation we provide solutions to meet the increasingly complex demands. This is Parker helping to solve the world’s greatest engineering challenges.
BMG’s products for welding fume extraction

BMG’s Tools & Equipment division has introduced a range of specialist products, systems and services to assist industry to create a healthy and safe work environment, by reducing the risks associated with welding and cutting fumes, grinding dust and oil mist.

BMG’s Plymovent solutions for source extraction include portable fans, fume extractors and extraction hoses, mobile and stationary welding fume filter units with integrated fans. The range also includes filtration systems, modular extraction hoods, fire safety solutions and oil mist filters. A specially designed workbench provides extraction and filtration for welding and grinding applications.

The PHV filter unit is a compact, portable unit, which is particularly well suited for the extraction of welding fumes at source during maintenance and moderate welding applications. This unit is fitted with two motors to ensure effective extraction, while using nozzles or extraction through the welding torch. An HEPA filter – fitted as standard – ensures high filtration efficiency and also makes the PHV unit suitable for stainless steel welding fume applications.

The Plymovent PPE PersonalPro range includes helmets to protect the eyes, face and head during manual welding, cutting and grinding. These versatile auto-darkening welding helmets, with extended side vision, provide improved visibility, comfort and safety. An integrated lightweight Powered Air Purifying Respiratory (PAPR) unit provides protection against eye and face injury, as well as preventing respiratory problems. The PAPR unit blows clean air into the helmet, allowing the worker to weld and grind while breathing purified air via a particulate filter.

BMG also offers Translas plug-and-play ClearO2 systems for the extraction and filtration of fumes from welding processes, micro dust, vapours and odours. The range includes extraction torches, with various nozzles, for the safe removal of welding fumes at source. Portable extraction units are used in conjunction with fume extractor torches and are suitable for convenient use by individual and multiple welders in high-production welding environments.

For more information contact Andrew Johns, BMG, +27 11 620 7329, andrewj@bmgworld.net, www.bmgworld.net

Bright illumination for paint tunnel inspection

The WLB72 Inspection is a high-efficacy task light used for industrial work areas. It is simple to install, can be cascaded, and comes fully assembled. The bright, uniform output of the WLB72 reduces shadows, improves visibility, and gives workers the light they need to work efficiently and without making mistakes. While diffuse-even light can hide objects, the focused beam of the WLB72 enables workers to see contrast. The bright, focused white light of the WLB72 Inspection improves worker productivity and has a low cost of ownership.

The WLB72 Inspection has powder-coat finish for increased durability. It is ideal for industrial applications because it is rated for shock and vibration. The WLB72 comes fully assembled for faster installation and lower shipping costs. Dimming improves surface detection and allows for ease on the eyes. The WLB72 Inspection product is designed specifically for use in paint and surface inspection tunnels in motor vehicle, construction machinery, and aerospace manufacturing.

All models of the WLB72 Series are cascadable, simplifying installation and wiring for additional ease-of-use. The WLB72 Inspection allows for fast installation with multiple integrated mounting options or accessory brackets. It is a durable light with a metal housing and shatter-resistant window, and is rated for use at 120 V AC to 277 V AC.

Applications

WLB72 Inspection lights are ideal in industries that require uniform illumination, such as automotive, material handling, and general manufacturing. These bright lights improve safety, productivity, and quality in a wide variety of applications, including:

- Assembly line inspection for surface inspection.
- Offline inspection stations.
- Inspection lighting.

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

Detect plant maintenance requirements

The new smart ifm position sensors provide signals to alert operators before problems become critical. High resolution allows the sensors to detect even small changes in the switching area. In addition to the primary position sensor functions, they also provide additional information for condition-based maintenance in user applications. The MQ2 continuously detects ferromagnetic objects in front of its active face and signals soiling via IO-Link when the current value exceeds the set threshold, so that cleaning can be timeously arranged.

The same applies to changes in the switching area, e.g. caused by mechanical wear. The integrated operating hours and switching cycles counter allows the provision of a signal if the selected number of switching operations has been reached, enabling targeted maintenance to be performed.

For more information contact
ifm - South Africa, 0861 436 772, info.za@ifm.com, www.ifm.com
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When industrial systems have to deliver high productivity, engineers don’t rely on gut instinct. Instead, they rely on sensor technology from SICK. Our solutions ensure optimal processes. They stop expensive machine failure and downtime. They reduce changeover times. And they prevent personal injury and other accidents. In every industry and every area of factory automation. With photoelectric sensors, proximity sensors, fluid sensors, distance sensors, vision sensors, scanners, and opto-electronic protective devices – or services from SICK. When it comes to reliable production, the whole world draws on the engineering spirit of SICK. We think that’s intelligent.

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