WHAT HAPPENS WHEN IT ALL GOES WRONG?

AST CAN HELP MAKE IT ALL GO RIGHT

AST designs and supplies Automatic Fire Extinguishing Systems for customers that have rooms containing precious company assets and/or key processes that businesses rely on. Such systems include Pyroshield Gaseous Automatic Fire Extinguishing Systems which are designed for applications like server rooms/data centres, substations, UPS rooms, archive rooms, sensitive document stores, museums, flammable liquid stores, flammable gas stores, intrinsically safe areas and so forth.

CALL US FOR MORE INFORMATION

CALL: +27 (0) 11 949 1157
EMAIL: SALES@ASTAFRICA.COM

THE FUTURE OF FIRE SUPPRESSION TECHNOLOGY IS HERE.

WWW.ASTAFRICA.COM
Adoption of digitalisation is accelerating as pioneers demonstrate the efficiency and competitive advantages that digital transformation offers. CFOs, however, require measurable outcomes on which to base their investment in digital transformation. See this month’s cover story on page 22 for more on Siemens’ research into the value of digitalisation to manufacturers.
Digital transformation include people, and services

Digital transformation, according to Microsoft, is about reimagining how we bring together people, data and processes to create value for customers and maintain a competitive advantage in a digital-first world. So, while the fourth industrial revolution is underpinned by digital technologies, the revolution itself is not purely about technology. This is what makes digital transformation so disruptive to implement, one of the main obstacles to its adoption within industrial organisations.

The technologies themselves, which include big data and analytics, artificial intelligence, smart sensors, wireless communications, robotics and cloud computing, are all well publicised, and mostly, well understood. What sometimes gets missed though is an understanding of how to integrate these for new value creation. Mostly, the part that gets missed is that the technology itself will add very little by way of value, unless it is deployed within new business models. And, of course, new business models mean new ways of doing things, fundamentally reengineering them to enable new business models.

Essentially, many organisations expect to get the benefits of digitalisation without the hardship of driving the necessary changes. Whatever the reasons, executives tend to underestimate the organisational implications of a digitalisation strategy i.e. the need to realign people, processes, organisational structures and culture.

One local company that hasn’t fallen into the trap, and is getting things right in this area, is RCL Foods. The company’s Transformation Project Manager, Hilde Volshenk, describes in an article in this issue how digital transformation all starts with people. She identifies the five dimensions of digital transformation at RCL Foods as company culture, empowered teams, customer experience, data and innovation. The transformation strategy centres around these five areas, and then involves everyone in the organisation. It includes technology, yes, but it all starts with people. See the article on page 40 and prepare yourself to go ‘all in’.

Adding services to products – an Industry 4.0 solution

On the subject of digital transformation, contributing editor Gavin Halse provides an interesting take on how manufacturing companies can use Industry 4.0 technologies to supplement traditional product offerings with value-added services. He even introduces a word for this: servitisation is the process of developing capabilities in a manufacturing company that supplement traditional product offerings with value-added services. For example, selling maintenance contracts for capital goods is an example of a service being added to a product.

The idea of servitisation is not new, and in fact does not even rely on digital technology for its implementation; after all, maintenance contracts have been around for years. What makes the technologies of the fourth industrial revolution enable is the creation of ‘smart products’ which then allow the ideas of value-added services to be advanced further than was possible before.

Some commentaries are calling this the real fourth industrial revolution, based on the relentless drop in profits from the manufacturing sector, while the profits of service-providing companies continue to grow. No surprise then that manufacturing executives have recognised the competitive advantage of including services to boost declining revenue through fully integrated product offerings.

But, as Gavin points out, the clock is ticking. When one considers the complexity of a digital transformation strategy, it is not surprising that many manufacturers who intend to embark on the journey are still at the starting point. Short term business pressures make it difficult to plan the way forward, with many people simply too busy surviving to worry about Industry 4.0. Nonetheless, if competitive advantages and barriers to entry are to be protected in the digital age then new business models must be found, which include services and the people who provide them. The article on page 48 could help to get you started.

Steven

Editor: SA Instrumentation & Control
steven@technews.co.za
SA Gauge - Reliable Under Pressure
Locally manufactured, standard & non-standard / OEM pressure gauges, branded with your company logo. Made to order with short lead times. Repairs and calibration certificates to all other brands.
SANAS ISO/IEC 17025:2005 Accredited
Yokogawa Electric Corporation has received orders to provide 59 high-performance FluidCom chemical injection metering valves for two offshore oil fields that are being developed by Equinor ASA, a Norwegian energy company. One destination is the Johan Sverdrup field in the North Sea, 160 km west of Stavanger, and the other is the Johan Castberg field in the Barents Sea, 240 km northwest of Hammerfest.

The Johan Sverdrup field is estimated to have reserves of between 2,1 and 3,1 billion barrels, making it one of the five largest oil fields on the Norwegian continental shelf. Oil and gas from this field will be piped to separate onshore facilities. For the Johan Castberg field, which is estimated to have reserves of 450 to 650 million barrels, the plan is to use a floating production, storage and offloading (FPSO) vessel. Both projects are scheduled to start operation in 2022.

Festo has opened its first North American Festo Experience Centre in the heart of Silicon Valley. With the ever-increasing linkages between making things and controlling processes through cloud computing and big data, the company said Silicon Valley was the optimum site for its newest experience centre.

The Festo Experience Centre, Santa Clara, features a demonstration hall where augmented reality devices allow visitors to experience virtual manufacturing and processing systems utilised in such industries as semiconductors and electronics, solar and flat panel, assembly and test, medical technology, laboratory automation, food and packaging, and process automation. Rotating exhibits showcase active and static displays of the latest automated manufacturing and processing solutions. The centre also features a laboratory for focused customer solutions and training and meeting areas.

The global CERN collaboration in Switzerland has found a missing piece in the enduring puzzle known as the Standard Model in Physics. Observation of the Higgs boson’s decay to bottom quarks marks an event that further validates the Standard Model, which is to physics what DNA is to bioscience. The observation fills a gap in the understanding of the Higgs sector; something that could ultimately reveal new physics should unexplained differences to Standard Model predictions ever occur.

The discovery was made possible thanks to the immensely powerful computer systems that process the data streams which pour from CERN’s Large Hadron Collider when it runs. Researchers from the University of Johannesburg formed part of the international team that pioneered the advanced computing techniques required for this experiment.

The discovery was announced on 28 August.
Going Above and Beyond
to Enhance Your Operational Efficiency

Over the past 4 decades BMG has built up extensive product divisions and an unrivalled distribution network, along with a rock-solid reputation as Africa’s foremost supplier of engineering components. A convenient, single source of supply to the full spectrum of industry.

Along the way we’ve also cultivated a technically-proficient, specialist mindset and applied this technical knowledge toward the maximisation of our customers’ efficiency, productivity and ultimately, their profitability.

Today, this ongoing commitment to being a valuable ‘Part Of Every Process’ is proudly manifested in ways that go well beyond the physical products on offer.

THE WORLD’S BEST BRANDS, BOLSTERED BY A RANGE OF SPECIALIST SERVICES:
- Custom Design and Evaluation of products and systems.
- On-site Installation, Troubleshooting, Maintenance and Support.
- Condition Monitoring and Preventative Maintenance.
- Energy-Efficiency Studies and Recommendations.
- Hands-on Customer Training.

BEARINGS • SEALS • POWER TRANSMISSION • DRIVES & MOTORS • MATERIALS HANDLING
FASTENERS & TOOLS • HYDRAULICS • FILTRATION • LUBRICATION • FIELD SERVICE

www.bmgworld.net
Emerson has recently opened the Middle East and Africa Flow Service Centre at its Dubai campus. The facility will operate as a service centre for customers in the Middle East and Africa, offering internationally certified equipment and processes, as well as expert service, support and training.

“The establishment of the Flow Service Centre on Emerson’s Dubai campus reflects our ongoing commitment to the Middle East and Africa region, providing accessible local and certified services,” said Jeff Householder, president Middle East & Africa, Emerson Automation Solutions.

Emerson opens flow calibration centre for Middle East and Africa

The National Metrology Institute of the Netherlands has provided certification for the calibration equipment’s calibration and measurement capability (CMC) with an uncertainty of 0.03%. This CMC certification reflects the Emerson facility equipment’s quality, technical competence, traceability, and capability.

With this local service, customers will experience minimal process downtimes and reduced operational costs along with the assurance that calibrations performed in the centre meet internationally certified standards. Apart from the flowmeter calibration service, Emerson’s Middle East Flow Service Centre also offers services that range from flowmeter diagnostics and evaluations, meter repair, witness inspection services and documentation performed to guarantee calibration and testing quality, and factory-designed training programs conducted in the customer’s site or in the facility itself.

For more information contact
Rob Smith, Emerson Automation Solutions,
+27 11 451 3700,
rob.smith@emerson.com,
www.emerson.com

Fabric – launched in Johannesburg on 23 August – showcases how digitalisation of the industrial world is fast becoming the biggest transformation of our time, and highlights how data combined with smart technology will ensure that tomorrow’s cities are more connected, efficient and powered.

Three African fashion designers created 12 extraordinary outfits from vast amounts of data extracted from the chosen cities. The intricate garments by John Kaveke (Kenyan), Zizi Cardow (Nigerian) and Palesa Mokubung (South African) outline a variety of patterns from power grids, shipping and tonnage to population densities, transport and areas of connectivity. Data from each of these sectors tells a powerful story about each city and how digitalisation can transform them. All of this is told through the universal language of fashion and design.

“This is how we thought to express the aspect of digitalisation,” said Keshin Govender, group communications head for Siemens South Africa. “As urbanisation rapidly increases, cities need to start preparing for the effects it will have on infrastructure, energy, water and transportation systems.

“Data gives greater insight on what makes each city tick, helping us make calculated decisions and improve service delivery to the people. Through the Fabric project, it was evident that the challenge is not what to do with the avalanche of data, but rather accessing reliable and recent data. This project has highlighted the need for access to data in order to make sound urban planning decisions.”

Siemens is well positioned in automation, electrification and digitalisation to find solutions to the various challenges of today. It is uniquely positioned to unlock the potential of digitalisation through its combination of digital expertise, domain know-how and understanding of hardware in order to leverage digital technologies and optimise operations.

“While there is a growing adoption of intelligent machines within certain sectors like the automotive industry, the real opportunity for Africa lies in sectors where it has not yet been explored like manufacturing, energy and transportation,” concluded Govender.

“This is a remarkable opportunity for Africa, which will result in the establishment of new industries and new jobs while exponentially increasing skills development and contributing to GDP.”

For more information contact
Keshin Govender, Siemens South Africa,
+27 71 492 3789,
keshin.govender@siemens.com,
www.siemens.co.za

Fashion and data combine to create iconic African designs

The power of technology and fashion has combined in a thought-provoking project that demonstrates how data can transform African cities. Technology leader Siemens used data from the cities of Lagos, Nairobi and Johannesburg and wove it into unique fabrics which tell a story about each city. Three iconic African fashion designers then used the fabrics to create one-of-a-kind outfits, which are as stylish as they are smart.

Fabric – launched in Johannesburg on 23 August – showcases how digitalisation of the industrial world is fast becoming the biggest transformation of our time, and highlights how data combined with smart technology will ensure that tomorrow’s cities are more connected, efficient and powered.

Three African fashion designers created 12 extraordinary outfits from vast amounts of data extracted from the chosen cities. The intricate garments by John Kaveke (Kenyan), Zizi Cardow (Nigerian) and Palesa Mokubung (South African) outline a variety of patterns from power grids, shipping and tonnage to population densities, transport and areas of connectivity. Data from each of these sectors tells a powerful story about each city and how digitalisation can transform them. All of this is told through the universal language of fashion and design.

“This is how we thought to express the aspect of digitalisation,” said Keshin Govender, group communications head for Siemens South Africa. “As urbanisation rapidly increases, cities need to start preparing for the effects it will have on infrastructure, energy, water and transportation systems.

“Data gives greater insight on what makes each city tick, helping us make calculated decisions and improve service delivery to the people. Through the Fabric project, it was evident that the challenge is not what to do with the avalanche of data, but rather accessing reliable and recent data. This project has highlighted the need for access to data in order to make sound urban planning decisions.”

Siemens is well positioned in automation, electrification and digitalisation to find solutions to the various challenges of today. It is uniquely positioned to unlock the potential of digitalisation through its combination of digital expertise, domain know-how and understanding of hardware in order to leverage digital technologies and optimise operations.

“While there is a growing adoption of intelligent machines within certain sectors like the automotive industry, the real opportunity for Africa lies in sectors where it has not yet been explored like manufacturing, energy and transportation,” concluded Govender.

“This is a remarkable opportunity for Africa, which will result in the establishment of new industries and new jobs while exponentially increasing skills development and contributing to GDP.”

For more information contact
Keshin Govender, Siemens South Africa,
+27 71 492 3789,
keshin.govender@siemens.com,
www.siemens.co.za
Omron innovation

At Omron’s recent Innovation Conference held at the CSIR Conference Centre, delegates were briefed on the latest developments in Industry 4.0 and the Smart Factory, and the benefits of Omron’s new i-Automation solutions. Victor Marques, country general manager for South Africa and sub-Saharan Africa set the scene, with a preview of Omron’s exciting new Q2A series of VSDs, highlighting the value we can add to society when innovation is driven by social needs.

Applications engineer, Driaan Coetzer then explained Omron’s concept of i-Automation for smart factories. This comprises the three I’s, i-automation, i-intelligence and i-interactive, and together they facilitate innovation in manufacturing in a smart, connected factory. This leads to an improvement in overall equipment efficiency (OEE).

Today’s need is customised products and short production cycles, and by measuring OEE it is possible to reveal hidden costs due to unplanned stops and performance losses due to slow cycles; and Omron’s QF range of vision QC systems can offer solutions for industrial tasks that are repetitive, precise and difficult for humans. “We can track and trace and increase production while minimising losses in quality,” he explained.

Another innovation is the NX1 series 2 in 1 machine automation controller. The NX1 interprets the data in the controller and turns it to information and then actions a roadmap for intelligent production. “Our OEE improvement roadmap allows you to turn big data into actionable information – the key to OEE,” he says. Application engineer, Quintin Nel then introduced another of Omron’s advanced motion solutions, the i4H Scara robot series, which was developed in an alliance with Techman Robotics.

Omron is also the first in the industry to introduce motion control with artificial intelligence (AI). This is in the form of a library of algorithms and function blocks based on a machine learning engine. The machine automation controller can use AI in production processes. It monitors all the patterns in a machine, for example if a bottle moves or spills, and reacts accordingly.

The cherry on the top was the introduction of Forpheus, Omron’s ping pong robot based on its proprietary prediction model. Not only can Forpheus play ping pong, it can also predict the ball’s trajectory and adapt to its opponent’s skill level.

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

NI continues local operations through Test Dynamics

Following a review of the business model, National Instruments South Africa closed its doors for the last time in early 2018 as it had decided it could better serve the local market through a distribution channel. Test Dynamics was created to take the brand forward locally and has been appointed as the distributor of National Instruments’ test and measurement technology. The new company retains the same excellent support capabilities that National Instruments was known for, but is also able to provide turnkey solutions to customer test and measurement problems.

In addition to National Instruments, Test Dynamics also represents Quanser Control Products in the academic space, Micron Optics for fibre optic sensing, Mac Panel for high-density test interfacing, and Magtrol for precise rotational torque measurements.

Nicholas Haripersad and Stephen Plumb head up the sales team, while Jacques Cilliers leads the support and integration department.

Test Dynamics is based at 40 Monte Carlo Crescent, Kyalami Business Park.

For more information contact Stephen Plumb, Test Dynamics, +27 10 442 1700, stephen.plumb@testdynamics.co.za, www.testdynamics.co.za

Comtest to represent ISC

Comtest has announced that it now represents Industrial Scientific Corporation (ISC), a leading global provider of gas solutions. ISC develops, manufactures and services fixed and portable gas detection equipment for key markets that include utilities, chemical production, oil and gas, steel and coke, paper, fire service, construction, military, food and beverage, and general industry.

Founded in 1985, ISC has the vision to eliminate gas-related deaths on the job by the year 2050. The company believes that every such accident is preventable, and therefore, all are ultimately predictable. ISC also believes that providing great products and services is not enough, and is committed to arming customers with data that gives them control over all operational risks. This gives users the opportunity to make the changes that could save lives. ISC’s stated mission is “Preserving human life on, above and below the earth, delivering the highest quality, best customer service, at every transaction, every time.”

Whether it is gas monitors for remote sampling, detecting atmospheric hazards in confined spaces, area monitoring, or personal protection, ISC has a range of durable equipment backed by a ‘Guaranteed for Life’ warranty. Workers’ safety is given them control over all operational risks. This gives users the opportunity to make the changes that could save lives. ISC’s stated mission is “Preserving human life on, above and below the earth, delivering the highest quality, best customer service, at every transaction, every time.”

Whether it is gas monitors for remote sampling, detecting atmospheric hazards in confined spaces, area monitoring, or personal protection, ISC has a range of durable equipment backed by a ‘Guaranteed for Life’ warranty. Workers’ safety is catered for through the extended runtime power supplies and DualSense Technology.

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

**Extensive range of automation components available through Metal Work Pneumatic South Africa**

Metal Work Pneumatic S.p.a. Italy was, for many years, represented by various companies in South Africa. Recognising the need to consolidate its efforts and offer the local market a common point of contact, the company approached Johan Bester in 2017, with a view to launching a local subsidiary.

After filing the necessary documentation, Metal Work Pneumatic South Africa was launched in August 2017 and began trading in January 2018. Bester, who has been involved in the automation industry for over 22 years, says that while this is a relatively new local operation, it is able to leverage the experience, capacity and capabilities of over 1400 employees worldwide in 46 countries.

With its head office in Riverhorse Valley in Durban, Bester says the company plans to expand into the other provinces and simultaneously appoint distribution partners outside South Africa: “We have already appointed two main distributors in South Africa, one being Peninsula Pneumatics in Paarden Eiland. In addition to selling through distributors, we have a direct sales force and a trade counter which allows walk-in customers to buy directly from us in Durban. We have instituted an open door policy, which means that anybody is welcome to pop in and ask for a tour of our facilities at any time during working hours – from the media to suppliers, to potential customers.”

Providing a range of pneumatic and electric actuators, control components, air preparation equipment, fittings, tubing and various other accessories, together with several bespoke products, the organisation focuses on a number of strategic business practices that include lean thinking and a culture of continuous improvement. The company attacks waste through the value chain and employs the Kaizen (change for better) philosophy which increases flexibility and competitiveness through its people.

“We work together for a common purpose and use strict quality control, accompanied by the right products for the task at an affordable price,” says Bester. “We maintain constant contact with customers to identify, assess and meet their needs. More than 80% of our product range is manufactured in-house at the state-of-the-art facilities in Brescia, Italy.”

Metal Work Pneumatic S.p.a holds a number of certifications, including ISO 9001 (1992), ISO 14001 (2000), OHS 18001 (2007), as well as certification by Dekra and accreditation by TGA.

Training at the company is continuous. “We dedicate more than 5000 hours of ongoing training to our employees to ensure that they are completely up-to-date on the latest product iterations,” explains Bester. “We have a base of international trainers who travel around to the various Metal Work Pneumatic subsidiaries specifically to provide technical and new product training as required. Since the company releases up to 50 new products a year, this training happens on a frequent basis. I am also involved in providing in-house sales training to our employees.”

The fact that the company provides components for the entire industrial automation market, combined with its cumulative and collective team application knowledge, means that all industries are served. “In a nutshell, wherever increased production and automation is required we can provide automation componentry,” concludes Bester.

*For more information contact Johan Bester, Metal Work Pneumatic South Africa, +27 31 569 1584, johanb@metalworkpneumatic.co.za, www.metalworkpneumatic.co.za*

**SKF provides technical acumen as sponsor of the 2018 Sasol Solar Challenge**

SKF was a proud sponsor of the 2018 Sasol Solar Challenge (SSC). The eight-day solar journey kicked off in Pretoria on 22 September, finished in Stellenbosch on 29 September. This biennial competition draws teams from across the world in Stellenbosch on 29 September. This biennial competition draws teams from across the world in Stellenbosch on 29 September.

Approximately fifteen international teams including 2016 Dutch title defenders, Delft University, joined local teams to compete for the trophy. The South African contingent was represented by a number of Universities including the North West University, whose solar car team was the first African team to ever cross the finish line at the World Solar Challenge in 2015.

Growing from a mostly local event with only one professional competitor, this year, the sixth SSC was the biggest in its ten year history. Approximately fifteen international teams including 2016 Dutch title defenders, Delft University, joined local teams to compete for the trophy. The South African contingent was represented by a number of Universities including the North West University, whose solar car team was the first African team to ever cross the finish line at the World Solar Challenge in 2015.

For more information contact Samantha Joubert, SKF South Africa, +27 11 821 3500, samantha.joubert@skf.com, www.skf.com
## IoT.nxt joins leading companies as a Linux Foundation silver partner

During June, South African IoT technology and strategy innovator, IoT.nxt, joined a community of global companies as a silver partner of The Linux Foundation.

“There are great opportunities to use open source software in IoT applications, so we are excited to join the community driving implementation of Linux developments,” says IoT.nxt CEO, Nico Steyn. “Open source allows for incredible collaboration across companies, industries, organisations and individuals to solve particular technology challenges and drive value.”

Linux Foundation members help support development of the shared technology resources, while accelerating their own innovation through open source leadership and participation. Linux Foundation member contributions help provide the infrastructure and resources that enable the world’s largest open collaboration communities.

Jim Zemlin, executive director of The Linux Foundation, said at the announcement of new members that the Foundation is thrilled to see so many organisations continue to reinforce their commitment to open source with investments in the community and a wide variety of important projects.

Open source gained prominence in South Africa after the establishment of the Ubuntu Project by South African-born Mark Shuttleworth’s Canonical company in 2004. The Ubuntu Project is now a popular Linux-based operating system that is freely available worldwide with desktop and server editions.

With the support of its members, The Linux Foundation hosts open source projects across technologies including networking, security, cloud and blockchain. This collaborative development model is helping technology advance at a rapid pace in a way that benefits individuals and organisations around the world.

Other companies that became silver members in June include leading audio equipment company Bose Corporation, Anaconda Inc and ComponentSoft.

For more information contact Daleen van Wyk, IoT.nxt, +27 83 302 0827, daleen.vanwyk@iotnxt.com, www.iotnxt.com

## LSIS is changing perceptions

Ana-Digi Systems saw the opportunity to become the importers and distributors of the LG premium brand of automation and drive products in 1999, and first took the LG automation systems to the Electro Mining show in 2003.

In due course, LG rebranded their automation and drives to become the very recognisable LSIS (LS Industrial Systems), also known as LSLV (LS Low Voltage drives) and LSMV (LS Medium Voltage drives). Since 2005, the LS brand has become synonymous with robustness and reliability, and sales keep proving the superb worth of these ‘made in South Korea’ products.

Thanks to its loyal distribution partners, system integrators, OEMs and medium voltage clients, the company was once again able to host an LSIS stand at the 2018 Electra Mining show, where interest in the products proved as vibrant as ever.

For more information contact Stefan Walrond, Ana-Digi Systems, +27 21 914 9030, stefan@anadigi.co.za, www.anadigi.co.za

---

### 10th Annual Conference

**Thursday 14 / Friday 15 November 2018**

Black Eagle Hotel & Conference Centre
Doreen Avenue, Ruimsig, Gauteng, South Africa

"Smart Manufacturing & the Digital Enterprise"

Register now on line: www.mesa-africa.org

Contact us for further information:
conference@mesa-africa.org +27 (0) 82 528 1238
This year’s Solutions Breakfast focused on the IIoT and its growing importance in all facets of business operations. The breakfasts, in both Johannesburg and Cape Town, were well attended with guests enjoying a hearty meal and a cup of IIoTea.

Robert Wright, founder and managing director of RJ Connect, presented insight into the workings and complexities of the IIoT.

Wright explained the IIoT as: “A universe of intelligent industrial products, processes and services that communicate with each other and with people via a network.” He discussed the changes that the IIoT will bring for enterprises, system integrators and equipment manufacturers, as well as the fact that a massive 81% of businesses have not yet invested in the IIoT due to barriers such as cybersecurity, lack of standardisation and the often significant upfront costs involved.

Delegates enjoyed in-depth demonstrations of the latest IIoT Moxa products, presented by RJ Connect’s experienced field application engineers and sales team, while enjoying cupcakes to celebrate the company’s 21st birthday.

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

By Barry Elliott, managing director, Rockwell Automation Sub-Saharan Africa.

Consider the wider potential application for skilling people beyond the immediate environments of organisations.

Digital technology is having an immense impact in the operating, maintenance and training environments of industrial companies around the world, allowing them to prepare workers for real-life job situations through the capacity to deliver more experiential learning environments.

Rockwell Automation is among the industrial automation companies developing augmented reality (AR) technologies to simulate machine and plant environments. And with the recent acquisition of a $1 billion equity stake in PTC enabling the integration of AR into platforms such as FactoryTalk Analytics and MES software, we’re bringing even more analytical and diagnostic intelligence into manufacturing and plant management applications. As technology allows us to emulate the day-to-day experiences of a given job’s requirements with greater richness and accuracy, we are better able to improve the safety, knowledge and efficiency of our workforce.

Digital technologies go beyond industrial automation

Yet digital technologies such as PTCs are also positively impacting environments far beyond the more specialist context of industrial automation. The company’s ThingWorx IoT and Vuforia AR platforms are used by KTM and Caterpillar to improve knowledge and skills transfer to less experienced mechanics and introduce greater consistency and centralisation in the service methodology of their vehicles and equipment. Delivering real-time visual instructions for service procedures superimposed on the physical product via PTC software is helping these technicians to locate and access a mechanical fault and perform complete diagnostic evaluations to deliver the highest chances of successful repair processes. In retail, Walmart is using AR to train employees in customer service and shop logistics. Trades like welding are being taught through AR. From hospitality and finance to construction sites and healthcare, digital technologies are transforming our capacity to provide rapid knowledge transfer from the experienced to the novice.

The ability of technology to provide an experiential learning platform beyond theoretical constructs is a critical – but not the sole – reason for its growth as a tool in the training environment. It is also a technical medium we are familiar with, find easy to use and grasp intuitively.

If technology is not only a more effective, but more accessible, conduit for skills development, then why don’t we mobilise it for the urgent national project of building the skills base of our youth?

You see, this digital competence isn’t just accessible to an elite segment of society; it is the glue that binds a collective of digital natives, transcending specific classes, backgrounds and cultures. And as I’ve previously suggested, millennials in Africa use digital technology just as intuitively as anyone else in the world.

More than at any other point in our industrial history, therefore, we have the educational infrastructure to realign what is taught in our education systems to the skills required in the modern marketplace.

Government and business must collaborate on skills development

It is not just a shortage of jobs that’s fuelling the unemployment among young people in South Africa. In many areas, our workforce is simply inadequately skilled. So, while recent government initiatives are incentivising private business to employ young people – with the most recent Youth Employment Service (YES) campaign aiming to make over one million employment positions available to young workers – we need to ensure that they are adequately skilled to prosper in the work place.

With a constantly expanding portfolio of training material used in the workplace on an accessible medium, is there not the potential to scale these applications into broader learning environments – perhaps even schools – putting more relevant skills into the reach of our nation’s learners? Could the focus of our educational CSI be to tailor derivatives of suitable training material to an educational class experience? Let’s bring welding, assembly, customer service, machine and plant operating and engineering into formal learning streams using the educational technologies that already exist in the corporate world.

Perhaps the classroom required for this type of technical learning looks slightly different to the model that has been in service, largely unchanged, for over a century. Perhaps these ‘classrooms’ become more decentralised, with companies opening their training facilities, boardrooms, AV equipment and so on to scheduled technical classes?

However, if the precise logistics of deploying this new approach to education are to materialise, it will need the support and encouragement of government to enable, formalise and regulate educational streams based around skills acquisition. With the public and private sector dedicated to mobilising the power of educational technology to improve the possibilities for learning in the classroom, we can begin to build a system where the completion of a schooling stream produces people who are more prepared for the demands of the formal economy, and can be far more quickly and gainfully employed.

This is how we can begin to ensure our youth becomes a dividend, not a burden.

For more information contact Michelle Junius, Rockwell Automation Sub-Saharan Africa, +27 11 654 9700, mjunius@ra.rockwell.com, www.rockwellautomation.co.za
Online education is coming of age

Hands-on engineering via remote and virtual laboratories and simulation software.

A significant shift in the world of engineering is changing the reality of online learning. There is a prevalence of computing devices being embedded into everyday objects and it is a growing and determined trend. This trend, otherwise known as the Internet of Things (IoT), means that many everyday objects have the ability to send and receive data.

It is this development which changes the dynamic in the world of engineering and has strengthened the premise for online learning. IoT is facilitating the acquisition of meaningful and practical engineering skills even when they are studied online and off-campus.

The Engineering Institute of Technology (EIT), an international college dedicated to the education and training of engineers and technicians, has been captivated by the impact that the Fourth Industrial Revolution is having on education.

For many years EIT employed the tried and tested classroom-based training model with physical laboratories lugged around the world to city venues and onto engineering sites. This was a remarkably effective venture (if somewhat cumbersome) with over 520 000 participants over 25 years. But, as online technologies began to emerge, the Dean of Engineering at EIT, Dr Steve Mackay, contemplated the changing face of education and realised that it would ultimately serve engineers well. He witnessed many in the industry being denied access to the education and training they needed because of the tyranny of distance, the responsibilities of demanding jobs and budget constraints.

Engineering tuition goes online

Mackay spent four years of extensive research, resulting in a PhD, during which he analysed the various online learning platforms and available ‘tools’. This enabled him to devise an optimal method for EIT. He settled on an innovative, live and interactive approach to teaching, where industry-experienced instructors and lecturers are streamed in to students around the world, and where they have access to high quality remote laboratories.

In traditional learning environments, students of engineering rely on physical laboratories for hands-on practical applications. Given the inextricable link between engineering and technology, the utilisation of the Internet has become a key part of modern engineering education and offers equivalence to physical delivery modes. EIT students use simulations and log into remote or virtual laboratories to ably test their knowledge.

Learning through EIT means that students, wherever they are based, can access remote laboratories. They can interface with a pneumatic circuit control using a microcontroller, for example. There are also facilities involving simulation kits range from compressors, pumps, distillation columns, heaters and boilers. And they are realistic. With diagnostic tools rapidly becoming Internet-based, these simulations are very closely aligned with real-world plants. In fact, in many cases they are more useful as students are able to access a greater range of situations’ than is possible on site.

Students are stretched in terms of identifying and remedying encountered problems and support from experienced teachers is available to assist them.

There are some significant benefits inherent to practical applications tackled online. Apart from the accessibility and flexibility they offer, the limits of equipment can be tested. In an online medium this can be done safely, something that cannot always be achieved with real equipment.

Studies show equivalence in learning material face-to-face and online. And as the technologies become increasingly sophisticated they will all but disappear. When learning reaches that juncture – where students are no longer aware of the technologies involved, but are able to interact with excellent teachers and access laboratories which ‘take them onto the worksite’ – then online education will have come of age.

The future of engineering education must have the capacity to reach all students and then prepare them for real jobs in industry. Similarly, engineering graduates must have access to opportunities that allow them to continue to develop professionally, alongside their work, throughout their careers and beyond.

Simulation tools allow professional development from anywhere

For demonstrating the processes and operations of real-world sites, simulations are an invaluable tool. An example of a process plant simulation, giving students access to both the operator and field technician roles, is the Simtronics DSS100 package. Using this software students can ‘walk’ through an industrial plant to tune a process loop, for instance, or diagnose a fault such as an instrument air failure or the malfunction of a valve due to feedback position error.

The simulation kits range from compressors, pumps, distillation columns, heaters and boilers. And they are realistic. With diagnostic tools rapidly becoming Internet-based, these simulations are very closely aligned with real-world plants. In fact, in many cases they are more useful as students are able to access a greater range of situations’ than is possible on site.

Students are stretched in terms of identifying and remedying encountered problems and support from experienced teachers is available to assist them.

There are some significant benefits inherent to practical applications tackled online. Apart from the accessibility and flexibility they offer, the limits of equipment can be tested. In an online medium this can be done safely, something that cannot always be achieved with real equipment.

Studies show equivalence in learning material face-to-face and online. And as the technologies become increasingly sophisticated they will all but disappear. When learning reaches that juncture – where students are no longer aware of the technologies involved, but are able to interact with excellent teachers and access laboratories which ‘take them onto the worksite’ – then online education will have come of age.

The future of engineering education must have the capacity to reach all students and then prepare them for real jobs in industry. Similarly, engineering graduates must have access to opportunities that allow them to continue to develop professionally, alongside their work, throughout their careers and beyond.

For more information contact Edwina Ross, Engineering Institute of Technology,
+61 89 321 1702, edwina.ross@eit.edu.au, www.eit.edu.au
**Festo**

Who will benefit from this training? Mechatronic Engineers

ED811 – Servo and Stepper Motors and Controllers
Johannesburg 14-16 Nov 2018

HY132 – Proportional Hydraulics
Durban 14-16 Nov 2018

HY142 – Maintenance Hydraulics
Port Elizabeth 21-23 Nov 2018

For more information contact Sammy Kanye, Festo, +27 11 971 5626, DidacticTaC@festo.com, https://www.festo-didactic.com/za-en/training-and-consulting/courses/

---

**VEGA**

Who will benefit from this training? Automation Engineers

Measurement Solutions – Level, Pressure and Nucleonics
Roodepoort 20-22 Nov 2018

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

---

**Yokogawa**

Who will benefit from this training? Automation Engineers

VPENG – Centum VP Engineering
Randburg 12-16 Nov 2018

PROF – Profibus
Randburg 19-21 Nov 2018

For more information contact Marco Coccioni, Yokogawa South Africa, +27 11 831 6300, training@za.yokogawa.com, www.yokogawa.com/za

---

**Endress+Hauser**

Who will benefit from this training? Instrument Technicians and Engineers

TC1001 – Process Measurement and Instrument Configuration 1
Sandton 12-16 Nov 2018

TC1002 – Process Measurement and Instrument Configuration 2
Sandton 19-22 Nov 2018

TC1003 – Process Measurement and Instrument Configuration 1 & 2
Sandton 12-22 Nov 2018

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

---

**Festo**

Who will benefit from this training? Mechatronic Engineers

ED811 – Servo and Stepper Motors and Controllers
Johannesburg 14-16 Nov 2018

HY132 – Proportional Hydraulics
Durban 14-16 Nov 2018

HY142 – Maintenance Hydraulics
Port Elizabeth 21-23 Nov 2018

For more information contact Sammy Kanye, Festo, +27 11 971 5626, DidacticTaC@festo.com, https://www.festo-didactic.com/za-en/training-and-consulting/courses/

---

**SMC**

Who will benefit from this training? Mechatronic Engineers

TC-PNEU-B – Basic Pneumatics
Durban 7-9 Nov 2018

TC-PNEU-B – Basic Pneumatics
Cape Town 21-23 Nov 2018

TC-MECH – Mechatronics
Midrand 27-30 Nov 2018

For more information contact Riaan van Eck, SMC Pneumatics South Africa, +27 11 100 5866, rvanek@smcpneumatics.co.za, www.smcpneumatics.co.za

---

**SMC**

Who will benefit from this training? Mechatronic Engineers

TC-PNEU-B – Basic Pneumatics
Durban 7-9 Nov 2018

TC-PNEU-B – Basic Pneumatics
Cape Town 21-23 Nov 2018

For more information contact Riaan van Eck, SMC Pneumatics South Africa, +27 11 100 5866, rvanek@smcpneumatics.co.za, www.smcpneumatics.co.za

---

**SMC**

Who will benefit from this training? Mechatronic Engineers

TC-PNEU-B – Basic Pneumatics
Durban 7-9 Nov 2018

TC-PNEU-B – Basic Pneumatics
Cape Town 21-23 Nov 2018

For more information contact Riaan van Eck, SMC Pneumatics South Africa, +27 11 100 5866, rvanek@smcpneumatics.co.za, www.smcpneumatics.co.za

---

**SMC**

Who will benefit from this training? Mechatronic Engineers

TC-PNEU-B – Basic Pneumatics
Durban 7-9 Nov 2018

TC-PNEU-B – Basic Pneumatics
Cape Town 21-23 Nov 2018

For more information contact Riaan van Eck, SMC Pneumatics South Africa, +27 11 100 5866, rvanek@smcpneumatics.co.za, www.smcpneumatics.co.za

---

**SMC**

Who will benefit from this training? Mechatronic Engineers

TC-PNEU-B – Basic Pneumatics
Durban 7-9 Nov 2018

TC-PNEU-B – Basic Pneumatics
Cape Town 21-23 Nov 2018

For more information contact Riaan van Eck, SMC Pneumatics South Africa, +27 11 100 5866, rvanek@smcpneumatics.co.za, www.smcpneumatics.co.za

---

**SMC**

Who will benefit from this training? Mechatronic Engineers

TC-PNEU-B – Basic Pneumatics
Durban 7-9 Nov 2018

TC-PNEU-B – Basic Pneumatics
Cape Town 21-23 Nov 2018

For more information contact Riaan van Eck, SMC Pneumatics South Africa, +27 11 100 5866, rvanek@smcpneumatics.co.za, www.smcpneumatics.co.za

---

**SMC**

Who will benefit from this training? Mechatronic Engineers

TC-PNEU-B – Basic Pneumatics
Durban 7-9 Nov 2018

TC-PNEU-B – Basic Pneumatics
Cape Town 21-23 Nov 2018

For more information contact Riaan van Eck, SMC Pneumatics South Africa, +27 11 100 5866, rvanek@smcpneumatics.co.za, www.smcpneumatics.co.za

---

**SMC**

Who will benefit from this training? Mechatronic Engineers

TC-PNEU-B – Basic Pneumatics
Durban 7-9 Nov 2018

TC-PNEU-B – Basic Pneumatics
Cape Town 21-23 Nov 2018

For more information contact Riaan van Eck, SMC Pneumatics South Africa, +27 11 100 5866, rvanek@smcpneumatics.co.za, www.smcpneumatics.co.za

---

**SMC**

Who will benefit from this training? Mechatronic Engineers

TC-PNEU-B – Basic Pneumatics
Durban 7-9 Nov 2018

TC-PNEU-B – Basic Pneumatics
Cape Town 21-23 Nov 2018

For more information contact Riaan van Eck, SMC Pneumatics South Africa, +27 11 100 5866, rvanek@smcpneumatics.co.za, www.smcpneumatics.co.za

---

**SMC**

Who will benefit from this training? Mechatronic Engineers

TC-PNEU-B – Basic Pneumatics
Durban 7-9 Nov 2018

TC-PNEU-B – Basic Pneumatics
Cape Town 21-23 Nov 2018

For more information contact Riaan van Eck, SMC Pneumatics South Africa, +27 11 100 5866, rvanek@smcpneumatics.co.za, www.smcpneumatics.co.za

---

**SMC**

Who will benefit from this training? Mechatronic Engineers

TC-PNEU-B – Basic Pneumatics
Durban 7-9 Nov 2018

TC-PNEU-B – Basic Pneumatics
Cape Town 21-23 Nov 2018

For more information contact Riaan van Eck, SMC Pneumatics South Africa, +27 11 100 5866, rvanek@smcpneumatics.co.za, www.smcpneumatics.co.za

---

**SMC**

Who will benefit from this training? Mechatronic Engineers

TC-PNEU-B – Basic Pneumatics
Durban 7-9 Nov 2018

TC-PNEU-B – Basic Pneumatics
Cape Town 21-23 Nov 2018

For more information contact Riaan van Eck, SMC Pneumatics South Africa, +27 11 100 5866, rvanek@smcpneumatics.co.za, www.smcpneumatics.co.za

---
From the President’s desk

We are nearing the end of the year at a rapid pace. Festive decorations are up in the supermarkets and we are preparing for the last weeks left in the year. During September, the SAIMC hosted the Automation Breakfast. It was a ground-breaking event and a tremendous success. Industry responded with vigour and it was an honour for us to see such a positive response. The hard work by the SAIMC training team led by COO Johan Maartens certainly paid off. Please keep an eye on the SAIMC website for the photos and a webinar link for those who missed it (or maybe want to see it again).

Congratulations team. You are working towards changing the future of our country and providing an opportunity for individuals to educate themselves in ways that will help South Africa be competitive in the global economy. Few people get an opportunity to contribute in this way in their lifetime. I feel proud to know that the SAIMC has individuals contributing in this way.

The First Challenge also launched its program for the year. As proud sponsors of this we enjoy seeing the youth develop and hope to see more students form part of this initiative and truly get an opportunity to enjoy robotics. The FIRST team is always looking for people who want to assist. So, if you are able to teach kids how to program, or work as a volunteer at an event or even mentor one of the teams, please contact us so that we can get you in touch with Jurie Weidemann and his team.

For those who are attending a SAIMC yearend function at one of our branches, please share a photo on Facebook. And if I am at the event, please come and say hi. I truly enjoy meeting the members of the SAIMC. We can take a selfie together (#MeetingtheSAIMCPresident, #SAIMCyearendfunction, #SAIMCisawesome).

Enjoy the last few weeks of the year.

Yours in automation,
Annemarie van Coller.

Branches

Johannesburg: Ann de Beer at ann.debeer@wika.com; Mobile: +27 82 365 7856
Cape Town: Wade Shuttleworth at wade@Calibreza.com; Mobile: +27 81 899 9234,
Durban: Hennie Prinsloo at hennie@specas.co.za; Mobile: +27 82 324 5379
Richards Bay: Mervyn Govender at mervyn.govender@rbmAfrica.co.za; Mobile: +27 83 299 2260
Secunda: Johan Maritz at johanmaritz260@gmail.com; Mobile: +27 82 856 3865
Tshwane: Petrus Klopper at petrus.klopper@ai2sa.co.za; Mobile: +27 82 559 7437
Vaal: Juandré Heyneke at juandre.heyneke@wika.com; Mobile: +27 82 664 7884
Zambia: Enock Shikabeta at enockshikabeta@yahoo.com, Tel: +26 97 759 1936
Rustenburg: Mervyn Bartle at bartle.mervyn@gmail.com; Mobile: +27 82 920 5266
Council: Ina at admin@saimc.co.za, Mobile: +27 82 440 8957, Tel: 08610 72462 (08610 SAIMC)
At the last technology evening hosted by Comtest, Steve Sidney, director and honorary treasurer of The National Laboratory Association (NLA), gave a presentation on the role of the technical infrastructure organisations in South Africa.

Globalisation is increasing the demands on countries to demonstrate that they have the quality system to guarantee that products originating within are safe and ‘fit for purpose’. The quality infrastructure system allows countries to set standards, and test against them to determine whether products or services are fit for their intended purpose. In South Africa, we refer to the quality system as the Technical Infrastructure which includes:

- Standards.
- Accreditation.
- Measurement traceability.
- Technical barriers to trade.

The NLA is the representative body that evolved from the previous National Laboratory Accreditation service, after overall responsibility for accreditation was assumed by the South African National Accreditation System (SANAS) during 1998.

The NLA looks after the interests of the large number of laboratories in South Africa. This includes measuring, testing, calibration and verification, as well as laboratories which operate in well-defined areas of R&D in the natural and applied sciences.

We are all affected by technical infrastructure and it is important in our daily lives in areas such as trade, automation and instrumentation, medical devices, safety and environmental protection. Other topics covered by Steve included:

- Physical standards.
- Traceability (Metrology).
- Paper standards.
- Assurance of quality.
- Regional cooperation bodies.

The branch thanks Steve for this informative presentation.

**Technology evenings**

At the last technology evening, Marita van den Bergh from Proconics spoke about “An introduction to SIL and common misconceptions”. As always, at these meetings, bring your technical concerns, bring colleagues and friends, and come for a cocktail of friendships, business alliances and like-minded people united by the desire to be the best in the world of automation, instrumentation, measurement and control. Visitors are always welcome.

**Training days**

Thank you to everyone who attended our two days of training and to the following companies who made it happen: E+H, Rascals, DesSoft, Aerosud, AI2SA and KPMG. On that note, also a special thank you to NLA for hosting us.

**Golf day**

The branch once again welcomed its national patrons and other guests at the annual golf day on 15 August, hosted this year at the Centurion Country Club. Teams included those from Afrilek, ATTS, Barnard Inc, ifm electronic, Itron, Kagano, Levivi, Loadtech, Pepperl+Fuchs, Phoenix Contact, Proconics, Rodecon, Shorrock Automation, Siemens, Thenga Holding and Vega. The gold sponsor for the event was Proconics who’s one team also came second in terms of scoring. Loadtech was third overall, while first place went to ATTS. The committee is appreciative of the companies who supported the event and, from the feedback received, it sounds like participants enjoyed the event and had fun.
Secunda branch

The July technology evening was presented by Charles Matthews from BCX on the topic “Virtualisation within industrial control systems”. Virtualisation is a hot topic that has moved from being discussed to being implemented at an exponential rate. However, it is easier to adopt within IT environments than within the OT space. In recent years, OT has started moving towards Ethernet-based control, which has had a big influence on the move towards virtualisation.

A couple of benefits of virtualisation include:
- Limited hardware risk as the installed base will be reduced.
- Reduction of environmental footprint (less power needed and less heat generated within datacentre/rack room).
- Virtualise where certain old software applications are not supported on new hardware.
- Quicker turnaround time for application testing and server deployment.
- 100% failback scenarios.

The most important aspect of virtualisation is the design. Sufficient time should be allowed for this to ensure faultless design before implementation. The amount of resources required is one of the most important aspects of a virtualisation design, while power consumption and capacity to install these resources must also be considered.

The term ‘hypervisor’ is widely used within virtualisation and refers to computer software, firmware and hardware that creates and runs the virtual machines. There are several types of hypervisors, with each type considered depending on the function of the virtual machine.

Virtualisation is a topic that will be around for the foreseeable future and is certainly an exciting development. The branch thanks Charles and BCX for this informative and relevant presentation.

All instrumentation and control related technicians and engineers are welcome to attend the branch’s monthly technology evenings. The planned dates for the rest of the year are: 11 October and 1 November 2018. All presentations earn CPD points for ECSA registered persons and any enquiries can be directed to the branch chairman, Johan Maritz, johanmaritz260@gmail.com or +27 82 856 3865.

Vaal branch

The August technology evening was presented by Deon Lottering from SICK Automation. Deon has been in the industry since 1977 and has worked for Sasol, ASEI, Safripol, and Chevron Nigeria before joining SICK Automation, where he currently holds the position of sales engineer and process automation systems facilitator.

During the presentation Deon dealt with in-situ dust and gas measurement applications in sub-Saharan Africa. The focus was on different applications, methods and the importance of measuring and controlling the emission of dust into the atmosphere – mostly from industry applications like chimneys and outlet stacks – in order to keep the environment clean and life supporting for current and future generations.

It is important for us all to look after the environment to ensure that we sustain life into the future, a mammoth task that not only requires big industrial players, but each and every one of us, to make an effort to maintain a healthy environment.

The evening was well attended and the topic was both interactive and interesting.
The Zambia branch helped launch the MCTC Mufulira sub-ranch on Friday 17 August. MCTC is a mining training institution, which encompasses an instrumentation school under Mopani Copper Mines. This is part of the Zambian branch initiative to reach learning institutions that offer automation courses. They have established similar branches at CBU, Nortec and Kitwe Trades School.

**Technology evening**
At the September technology evening, Beckhoff Automation managing director Kenneth McPherson presented to a record crowd on the topic ‘PC-based Control – the basis for the 4th Industrial Revolution’. He was an interesting and passionate speaker and took us through the developments of IIoT and the role that Beckhoff plays in shaping the future of automation. He also touched on the integration of HART devices through FDT/DTM into PC-based control systems, ultra-thin integration of intrinsically-safe field devices, multi-touch control panels and panel PCs for hazardous locations, as well as big data analytics and remote data access in the cloud. With the current focus on the digital revolution this topic was most relevant, and with his credentials, Kenneth was well placed to present on the subject.

**Student award**
The second of three student awards of R5000 – sponsored by the Durban branch to promote the automation and control discipline and reward outstanding work – went to Xandre van Jaarsveld of DUT.

Hennie Prinsloo congratulated Xandre who then took members and visitors through a summary of his project, which he described as follows: “Last semester I was given a course assignment that required me to build a 4-20 mA current source. Essentially this is a power supply that maintains a constant current at its output, regardless of the voltage developed across its terminals. The build of the project was particularly interesting as an Arduino Uno R3 microcontroller had to be incorporated under the control of four push buttons used to enter the set point, which is subsequently displayed on an LCD. When the set point is fixed at 6 mA, for example, the output of the current source must be the same, something the feedback control circuit ensures. Also the output must always stay within the 4-20 mA range limits.

“I had trouble with the feedback loop at first and had to redesign to solve the problems. In addition, The 9 V battery did not last very long, so an external supply was eventually used to power the circuit. A nice addition for the future would be a low battery indicator, as the only way I could determine that the battery was flat was to test its output with a multimeter. My thanks to everyone who helped me with this project.”

**Zambia branch**

The Zambia branch helped launch the MCTC Mufulira sub-ranch on Friday 17 August. MCTC is a mining training institution, which encompasses an instrumentation school under Mopani Copper Mines. This is part of the Zambian branch initiative to reach learning institutions that offer automation courses. They have established similar branches at CBU, Nortec and Kitwe Trades School.
Abacus Automation supplies innovative, custom-developed technical solutions using standard PLCs, drives, scada and motion control equipment and is Siemens approved for crane automation. With 22 years in the industry, this award-winning and internationally acclaimed company has highly qualified, experienced and professional staff. It operates out of offices in KwaZulu-Natal.

Tel: +27 31 702 5767
sales@abacus-automation.co.za
www.abacus-automation.co.za

Altech Alcom Matomo specialises in the design and supply of turnkey communication systems such as wide area voice and data networks and scada/telemetry solutions, as well as user terminal supply and support. Backed up by highly experienced engineering, project management, systems integration and field engineering departments, these systems use products from the extensive Motorola network range.

Tel: +27 11 235 7640
nwatermeyer@alcom.co.za
www.alcommatomo.co.za

CSS is a proud Level 2, B-BBEE contributor which provides a wide range of solutions to its customers in the engineering and infrastructural environment. Its many awards from suppliers and clients testifies to its commitment to service excellence.

Tel: +27 31 914 0040
pieterv@cs-solutions.co.za
www.cs-solutions.co.za

Iritron is a new millennium technology company providing quality solutions in the fields of electrical instrumentation and control systems engineering, systems integration and simulations. It has a proven ability to manage projects efficiently and produce high quality results. It has an extensive track record of successfully implementing plant infrastructure reticulation, designs, and automation and information systems. Iritron, a TUV accredited ISO 9001:2008 technology company, is able to offer its clients PLC, DCS and Scada software and hardware, as well as electrical and instrumentation design, engineering, project management and commissioning services.

Tel: +27 12 349 2919
alwyn.rautenbach@iritron.co.za
www.iritron.co.za

As solution providers in the industry, Afrilek’s extensive skills encompass all aspects of electrical, control and instrumentation design; implementation and operation. The company provides complete automation and electrical solutions in projects, panel manufacturing, support and services, training as well as product distribution. Afrilek is a proud BBBEE, ISO 9001 and CIDB accredited company.

Tel: +27 11 372 9340
sales@afrilek.com
www.afrilek.com

Autotronix is a recognised leader in industrial automation design and implementation having attained its ISO 9001 certification. Autotronix offers its clients turnkey control system integration services for energy management, PLC/HMI/SCADA/VSD, manufacture of control panels, applications for water distribution and manufacturing. The company operates from offices in Gauteng and KwaZulu-Natal.

Tel: +27 31 705 0400
or +27 16 422 7644
sales@autotronix.co.za
www.autotronix.co.za

Hybrid Automation is an approved Siemens system integrator and partner for automation and drives, process instrumentation as well as motion control. This enables it to provide its clients with the latest technology and solutions. Its client base includes major blue chip companies and has gained a strong foothold in virtually all the engineering verticals.

Tel: +27 31 573 2795
info@hybridautomation.co.za
www.hybridautomation.co.za

Moore Process Controls provides process automation and optimisation solutions to realise the maximum potential of your plant and assets. Our offerings include DCS, PLC, scada, compressor control solutions, MES, production management and predictive maintenance systems, control loop optimisation, alarm and energy management systems, plant security and access management systems, Matrikon OPC, Osi Soft, dashboards and historians, wireless and data solutions including digital twin, process simulators and training simulators and cloud-based IIoT solutions.

Tel: +27 11 466 1673
info@moore.co.za
www.moore.co.za
Systems Automation and Management

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

Tel: +27 11 394 5412
systems@process-dynamics.co.za
www.process-dynamics.co.za

Process Dynamics

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

Tel: +27 11 803 0570
info@sam.co.za
www.sam.co.za

PSY International

PSY International specialises in industrial automation and process control. As an approved ABB Authorised Value Provider for softstarters, VSDs and UMCs, it guarantees supply of high quality and technologically advanced products for energy measurement and monitoring. Its core competencies include system integration; control panel building and commissioning; automation design and supply; maintenance and breakdown service; PLC and scada software development and building management systems.

Tel: +27 11 782 5449
paul@psy-intl.com
www.psy-intl.com

Saryx Engineering Group

Saryx Engineering Services offers complete solutions to optimise plant-wide process control and enable operational excellence and focuses on industries that require continuous control for complex, business critical operations, including mining, metals & mineral processing, chemicals, utilities/water, but is equally comfortable with smaller non-critical projects.

Tel: 086 099 5105
ingrid@saryx.co.za
www.saryx.com

Not just a list . . .

Annual package includes:
- Full company listings as above
- Two A4 pages of in depth case studies or company profiles written by our journalist
- These will appear in print and online at www.instrumentation.co.za
- PDF copy of all articles will be available for your own marketing purposes
- Your SI listing will be published in full in the System Integrator section of the annual SA Instrumentation & Control Buyers’ Guide with a link to your url

To find out how you too can be included, contact:
Jane: +27 31 764 0593 | jane@technews.co.za
Laura: +27 11 543 5806 | laura@technews.co.za
At a certain age, around 70, our bodies begin to show signs of wear. What becomes apparent is that our built in control loops and data processing software steps in to compensate, and covers the gaps in the best way possible, working with the degraded sensors and equipment still functioning.

This was first obvious to me when I started to try to monitor the effects of glaucoma, which results in blind spots in the areas of sight for each eye. This is not apparent in normal life, as what you see is the brain-processed image from two eyes. Where one eye has a blind spot, data from the second eye is used to complete the single image in the mind – and this is how we do not notice the normal blind spots everyone has where the optic nerve leaves each eyeball. With the early stages of glaucoma, the small blind areas are only obvious when one eye is closed, so that your brain only works from one sensor. But our own sophisticated data processing fills in the blind spots everyone has where the optic nerve leaves each eyeball.

When glaucoma gets severe, the blind spots from each eye begin to overlap, meaning that the processor has no data coming in from either of its two sensors for certain areas of your view, so the processor moves up a gear and fills the area with sort of a plain colour, the same as the surrounding areas. But actually it tries harder, and if you were viewing an array of books on shelves, the mind can insert a sort of composite image of the books there, and fill the blind spot: it almost tries to fill the space with past image information, when it last had an input from that area – when you were looking at that spot maybe. But the brain is not so good at this, and anyway it is old data. The driving authorities do not allow glaucoma sufferers to drive cars, as a child, or animal, or bollard, can disappear in a blind spot, replaced by an image of the surrounding tarmac road surface.

Astronomers already use this approach to refine telescope pictures of planets: getting the sharpest bits of multiple repeat images, disturbed by atmospherics, vibration etc., which can then be processed to produce an unblemished image.

Cataract operation
Cataracts affect the vision, basically by making the image less precise, almost by adding a fog. I have just had the right eye operated on, and a ‘clean’ plastic lens inserted to replace the old cloudy lens. This does not help the glaucoma, but it gives the processor a whole new set of problems. Having worn glasses for myopia for 60 years, these were discarded as the new lens can see perfectly at distance. The brain now still uses the two sensors, but presents preferentially the sharply focused image from the right eye for distance viewing, suppressing the fuzzy, out of focus image still available from the left eye. For close up views, maybe when reading, the left eye image is used, as the muscles of the right eye have lost some of their strength, and cannot focus up-close. So the brain switches sensors. All this happened straight away, no learning time needed.

It was more of a problem when my glasses came back, one lens replaced with plain glass. Maybe they had been distorted by the optician, but the two images were displaced vertically with respect to one another. This requires the eyeballs to not move together, as they do when moving from side to side, but for one eye to move up with respect to the other. Not easy, particularly as the processor called on muscles not accustomed to such work to operate separately. So there was a mechanical delay in the control loop, of around a second, whenever I moved my gaze onto a different subject. The brain was doing the job, it was just the body complaining! However, a better option here is to adjust the frame of the glasses to restore normal operations.

But do I need to wear glasses at all … or can the brain do the job without them?
Economic thought and lessons from China

Through my past experience occupying various roles across multiple industries and institutions in South Africa, one thought that inextricably captures my imagination is the impact of macro-economic dimension; rapid e-commerce expansion, on the South African economy. This is against a backdrop of slow technological development, particularly in sectors such as local manufacturing.

In search of cheaper products, South Africans in all spheres (individuals, firms and industries) make use of rapidly expanding e-commerce to purchase cheaper products from technologically advanced economies such as China. This negatively affects gross domestic product by diminishing local demand and drives economic growth downwards. The delay and sluggish progress in adopting Industry 4.0 technologies in local industries, if it persists, will worsen the situation as costs of production will continue to rise, while technologically advanced economies are scaling up due to their lower cost of production advantages. The assertions by United Nations Industrial Development Organization (UNIDO) fortifies this view in reporting that South Africa’s manufacturing share of GDP has been in hasty decline since the early 1990s to approximately 12% today, while the service sector has expanded over the same period. In simple terms, the above economic movement indicates that the demand for local products is plunging due to high costs of production, which drives local product pricing upwards.

Lessons from China (intra-BRICS investment partner)
A Journal of the China Policy Institute from the University of Nottingham and South China Morning Post (SCMP) Institute, corroborated by insights from the BRICS 2018 summit held in Sandton, reported China’s State Council’s ambitious artificial intelligence (AI) strategic plan to create a domestic US$150 billion AI industry, and make China a global innovation centre by 2030. CB insight study indicates that of the US$15.2 billion invested in AI start-ups globally in 2017, 48% went to China, for the first time surpassing 38% investment portion attributed to the US.

In support of the ambitious 2030 Chinese government plans, its ministry of education launched the AI training programme in April 2018, under which at least 500 teachers and 5000 students will be trained at top universities in an effort to cultivate the talent required to support these initiatives. The government of China recognises AI, and technology in general, as a cornerstone of their economic development, and announced in January that US$2.1 billion will be spent to build a giant AI industrial park in Beijing with the intent to host over 400 enterprises focused on developing products and services in cloud computing.

It is against this backdrop that China will continue to dominate globally as a world manufacturing hub. It is for these and other reasons that, for example, all Apple devices are designed in California, but assembled in China.

The above culminates in three lessons that we South Africans can learn from our Chinese counterparts. The first is government support; the second is a vibrant start-up culture; and third, a population that is enthusiastic about technology. The Chinese population and related cultural orientations are worth a deeper level of examination because, unlike populations and cultural orientations in some other economies, technology is adopted at a rapid rate rather than waiting for privacy related policies, intellectual property (IP) regulations and many other seemingly progress-halting laws and regulations. For instance, Vodacom South Africa in the year 2018 implemented and commissioned 5G technology in Lesotho and could not do so in South Africa due to home country related restrictions.

The 2018 readiness for the future of production report by the World Economic Forum (WEF), in collaboration with global consulting firm A.T. Kearney, indicates skill shortages (e.g. digital skills) in South Africa as one of the stumbling blocks with respect to the future drivers of production. These observations compel us as South Africans to learn from others while at the same time championing change from within. This may very well be an important part of the solution to saving our slowing economic growth.

Oratile Sematle

Oratile is the electrical and instrumentation manager at Sasol Group Technology. He holds a bachelor of science degree in electrical and electronic engineering as well as an MBA from the University of Cape Town. As the former president of the Society of Automation, Instrumentation, Measurement and Control (SAIMC), he helps to drive the vision shared by council to address issues specific to the automation industry, and is partly accountable for the development of the automation engineering profession in South Africa. Oratile is a conference speaker and has spoken at engineering events such as Industry 4.0 and African Automation Fair. His ambition is to form cross-industry coalitions to tackle the social and educational problems experienced by disadvantaged communities.
The Digitalisation Productivity Bonus

Siemens researches the value of digitalisation to manufacturers.

Adoption of digitalisation in manufacturing – Industry 4.0 – is accelerating as pioneers demonstrate the substantial efficiency and competitive advantages that digital transformation offers. Manufacturing CFOs, however, require measurable outcomes on which to base their investment in digital transformation.

Original research involving management consultants, manufacturers and academics indicates consensus across the globe that measurable improvements in manufacturing productivity are the CFOs’ starting point, a concept that is relatively straightforward to translate into solid financial gain.

Drawing on the original research, as well as a variety of other published sources, this article summarises the key points of value that digitalisation and automation can deliver to those companies that start to invest in this new wave of digital technology.

Dimensions and perspectives
The vast majority of manufacturers and consultants surveyed confirm that the ability to increase manufacturing productivity is the starting point for deriving measurable value from digitalisation. The ability to manufacture the same product volume at less cost, or to manufacture more products for little or no increase in costs, resonates with manufacturers considering investing in digital technology to enable competitiveness.

Respondents stressed that the cost components of manufacturing productivity vary between industries and countries. In some sectors, the ability to reduce energy can lead to significant economic benefit. Other typical components of production efficiency include reduced downtime and shorter setup and changeover times. In addition, digital data fed from sensors into analytic packages enables predictive maintenance strategies that minimise the impact on production peaks and reduce downtime.

Digitalisation also gives companies the ability to offer mass customisation – where smaller, highly individualised production runs can be processed at much the same cost as mass production – in the form of faster setup and changeover speeds. Calibrations, settings and tolerances are all stored in a digital ‘brain’ and implemented automatically, thereby eliminating manual, sequential and time-consuming setup processes.

The digital twin
One aspect of digitalisation that needs special mention is the implementation of a digital twin. The twin is a virtual representation of a product, production process, or even an entire plant, which enables the individual process stages to be modelled and tested before anything is ever built. This creates consistent improvements in efficiency, minimises failure rates, shortens development cycles and opens up new business opportunities. In other words, it creates a sustainable competitive advantage.

However, developing and implementing a digital twin calls for powerful computer and software systems capable of modelling them along the entire value chain. The Siemens
Digital Enterprise Suite offers integrated software and automation solutions to create a comprehensive approach: a central data platform is used to digitalise the complete value-adding process. Intelligent industrial communication networks provide for simple data exchanges within the different production modules and collect operational data on an ongoing basis.

With the step from integrated engineering to integrated operations, Siemens enables companies to build a comprehensive data model from plant engineering to operation. This digitalisation ensures a shorter time to market, greater flexibility and increased efficiency, which gives manufacturers the opportunity to respond successfully to the volatility and diversity of global markets, and to increase their productivity as well as energy and resource efficiency.

The Digitalisation Productivity Bonus

The various categories of value derived from digitalisation highlighted in the previous section are compelling and have already been realised by a range of manufacturers. Some elements, however, are challenging to translate into a precise financial amount. Competitive advantages from greater turnaround agility or mass customisation capabilities are clearly of value, yet these are more difficult to quantify. One exception is increased manufacturing productivity, where the ability to either produce the same number of products for less or more products for the same has a clear and calculable positive effect on costs – the Digitalisation Productivity Bonus.

In the words of the manufacturer

Of course, manufacturers only gain the Digitalisation Productivity Bonus once they have upgraded production technology to the new generation of digitalised systems and have, as a result, realised the benefits in practice. The new technology delivers reduced production costs that can then be diverted to invest in growth or to return more value to shareholders.

International manufacturing companies were invited to comment on their individual experiences with converting to digitalised (‘fourth-generation’) equipment in terms of the manufacturing productivity gains they experienced from this investment. Respondents’ comments reflect the research finding that companies experience financially measurable gains from the improved manufacturing productivity that results from investing in fourth-generation digitalised technology.

The benefits gained accurately reflect the key points of value and, broadly speaking, are being applied according to such organisational priorities as enhancing profit margins, developing competitive capabilities, offering better pricing, improved forecasting and planning, and investing in new product development.

Sector focus: food and beverage

The value of digitalisation really comes alive when described in terms of a specific industry and its challenges, processes and opportunities. The research examined some of the ways Industry 4.0 is being applied in the food and beverage industry, a sector that is economically significant across the world. There are a number of key focus areas where digitalisation creates value in the sector; a selection of these is described below.

Reaching down the food-supply chain, one sees that agricultural production benefits from digital data. In the food-processing industry, information on the expected quality of an ingredient might be available even before harvest (e.g., on the basis of data on weather conditions). This information will be relevant for adapting manufacturing processes or sourcing other ingredients.

“The new digital technology delivers reduced production costs that can be invested in growth or returned to shareholders.”

Another area where Industry 4.0 can help is with food quality. Shelf life is undeniably a real issue for many food manufacturers, and for businesses that make fresh products the same day they are shipped, it is important not to overproduce. Digital information flowing up and down the distribution and supply chains improves coordination of supply and demand, while electronic traceability allows producers to track items from dispatch to the supermarket shelf. Uncovering patterns in data also allows businesses to anticipate customer demand, enabling them to refine their processing schedules.

Packaging is another operation to benefit from smart factory technology. Working with a crowdsourcing platform, a major global beverage company gathered data on customer product labelling ideas. Participating customers were then able to order the product in small quantities with their own label configuration. This ‘mass customisation’ was only possible and affordable using digitalised Industry 4.0 print and dispatch technology. Not only is this a good example of mass personalisation, but it also shows how technology can be used to build brand image and customer relationships.

The chain of digitalisation continues in the factory, where it is imperative that the cold or hot chain is not interrupted while a product is being processed, otherwise whole batches of food could become unusable under certain conditions. IoT monitoring of fridges and other temperature-controlled environments enable automated alerts and escalation routines, making it possible to quickly identify and rectify irregularities.

Logistics and materials handling are other areas that derive value from digitalisation. Automatic guided vehicles (AGVs), once the domain of manufacturing operations like automotive plants, are making their way into the food and beverage industry and consumer packaging applications, replacing human-operated forklifts for moving raw materials and finished products around the food processing plant. Although the fundamental purpose of automated vehicles is to move materials in a plant more cost effectively, these vehicles offer other benefits as well, including reduced product damage, reduced inaccuracy and reduced safety risks.

One industry observer described an even more futuristic vision about how factories will interact to create significant economic advantage. While today’s food-industry systems are centrally controlled, in the future machines and raw materials will use information and communication technologies to link through a global network and independently organise production across company boundaries.

Based on the research findings in the global food and beverage manufacturing industry, it is estimated that conversion to digitalised technology could deliver returns of between $290 billion and $450 billion.

For more information contact Jennifer Naidoo, Siemens Digital Factory and Process Industries and Drives, +27 11 652 2795, jennifer.naidoo@siemens.com, www.siemens.co.za
BMG’s range of industrial slurry valves, which are designed to cope efficiently in harsh mining conditions, includes robust butterfly and knife gate valves, as well as diaphragm and pinch valves.

“These industrial slurry valves meet stringent quality and safety specifications and are highly efficient on the mines for the control and isolation of abrasive slurries,” says Willie Lamprecht, national product manager, BMG.

“Failure of a valve and subsequent leaking of corrosive media can have devastating effects on the safety of personnel and equipment, leading to premature system failure and costly downtime. Therefore it is critical that the correct valve is selected for every application, for maximum safety, ongoing operation of the plant and minimum unscheduled maintenance.

“BMG’s skilled team has a thorough understanding of the processes and supports every component with a dependable solutions service to ensure optimum safety, efficiency and the extended life of each system.”

In mining operations, selection of the correct industrial slurry valve is based on factors that include the size and shape of particles, pressures, temperatures and chemical content.

Polyurethane lined knife gate valves are available from BMG in standard sizes between DN 50 and DN 600, with manual, pneumatic and electric actuation. These valves have a wafer pattern and are manufactured from cast and ductile iron, with stainless steel discs. They can withstand operating temperatures of between -20 and 80°C as standard, with higher temperatures on request.

Polyurethane liner abrasion-resistant butterfly valves in a wafer pattern or with a lugged design are used for on/off and control of abrasive slurries. Butterfly valves are available from BMG in standard sizes between DN 50 and DN 400.

Locally manufactured FPV diaphragm valves, between DN 50 and DN 350 with manual or pneumatic actuation, are designed for abrasive slurry applications. These flanged diaphragm valves have a body pressure of PN 10 and can withstand temperatures between -10 and 80°C.

Long lasting rubber and jumbo rubber linings are suited for full-bore diaphragm valves with a high flow capacity and an efficient sealing capability, which shuts off any flow and prevents leakage. Full bore diaphragm valves also have a low pressure drop because there is almost nothing obstructing the flow when the valve is fully opened. This creates little resistance to flow, which makes these valves suitable for fluids with abrasive particles. The range also includes unlined diaphragm valves suitable for water treatment and general industrial applications.

FPV pinch valves, featuring a design where the sleeve is pinched to close mechanically or automatically by means of hand-wheel or actuator, are ideal for the control and isolation of abrasive slurries. Open frame pinch valves are available with a short and long frame design, in sizes between DN 50 and DN 600. The body is made from mild steel, but stainless steel is also available for specific applications. These valves, with soft rubber sleeves, have manual, hydraulic and pneumatic actuation and can withstand temperatures between -20 and 80°C.

BMG’s extensive range of components for fluid technology systems and general industrial applications encompasses valves, hydraulic hoses and fittings, accumulators, cylinders, heat exchangers, pneumatics, hydraulic motors and hydraulic plumbing, as well as pumps and reservoir accessories. The company also offers a total process and lubrication management solution, to meet exact market requirements.

For more information contact Lauren Holloway, BMG, +27 11 620 7597, laurenhy@bmgworld.net, www.bmgworld.net
A more measured world of water

Water loss from leaking infrastructure is a serious issue in many countries, with some losing over 2 trillion gallons per year. Find out how a more measured world of water delivers accurate measurement to help create sustainable infrastructure.

Want to learn more? Visit abb.com/measurement
Open channel flow is defined as flow in any channel in which the liquid flows with a free surface: examples include rivers and irrigation channels. Certain closed channels such as sewers, when flowing partially full and not under pressure, are also classified as open channels, which are used to conduct liquids in most sewer systems, sewage treatment plants, industrial waste applications and irrigation systems.

A flume is a specially shaped open channel flow section providing a restriction in channel area (Figure 1). The flow rate in the channel is determined by measuring the liquid depth at a specified point in the flume. The design of the flume is determined by the width of the throat: the bigger the throat the more flow through the flume. Common materials of construction are stainless steel, fibreglass and concrete. Similar measurements can be made with other flow restricting devices such as rectangular or vee-shaped weirs. However, flumes result in a lower head loss and are inherently self-cleaning, thus requiring less maintenance.

A secondary measuring device is used in conjunction with the flume to measure the rate of flow in the open channel. The ‘flowmeter’ measures the liquid level at one point in the channel and then converts this measurement into flow rate based on the known level-to-flow rate relationship of the flume.

There are a number of technologies for measuring the level in the channel. The most common is the non-contact method utilising ultrasonic and radar sensors. The open channel flow meter uses software to convert the nonlinear level measurement into a flow rate.

WIKA recently received an order to supply 3-inch and 9-inch Parshall flumes constructed from 2 mm 316L stainless steel. The flumes will be installed at the NCP Chlorchem site to measure exit effluent flow into the Jukskei River.

As mentioned previously, the level probe must be positioned at a special point in the throat of the flume. A frame has been attached to the walls of the flume positioning the level probe in the correct position. This will simplify the installation, as there will be no confusion as to where the level sensor must be positioned. The frame serves two purposes: one is to position the level sensor correctly; the second is to provide the capability to check the zero and range calibration of the flow meter while there is flow through the flume.

As can be seen in the image above, there are tabs attached to the side of the flume. This is for securing it into a concrete structure and to prevent the sides from caving in. The straps across the top are for structural support during installation only, once the concrete has cured they will be removed.

Parshall Flumes can be favourably installed in the following applications:
- Sewage works: because of the self-cleaning effect, no debris is collected on the side walls.
- Factory-treated effluent discharge into rivers.
- Measurement of irrigation water in open channels to predefined areas.
- Discharge water from purification plants.

For more information contact WIKA Instruments, +27 11 621 0000, sales.za@wika.com, www.wika.co.za
EcoStruxure™ for Water & Wastewater

Digital transformation in the Water & Wastewater industry

Leveraging advances in technology – like IIOT, Schneider Electric is helping customers turn industrial automation into the Profit Engine of their operation. Automation architectures can now be perfectly aligned with the natural topology of each customers’ industrial asset architecture. Traditional control functions can now be extended to include control of safety risk, cyber security risk, environmental risk, reliability risk and even profitability. When this is done automatically, we call this smart control, when done manually, we call it empowered workforce. When this extended control is applied to every asset - from pump to plant – every asset throughout the industrial enterprise becomes optimized. The outcome is customers will be able to measurably maximize their operational profitability, safety and sustainably.

Scan to discover our Water Solutions.

www.se.com/za
Part of the Lower Thukela Bulk Water Supply Scheme (LTBWSS), the plant, constructed at a cost of R1.4 billion and funded by Umgeni Water and the Department of Water and Sanitation, will eventually supply approximately 340 000 people in the iLembe district with potable water. This will be the first time many of these people receive a reliable supply of safe drinking water.

In what is one of the largest municipal potable water treatment plants undertaken by Veolia South Africa, the company was responsible for supplying the required mechanical and electrical components for the treatment plant as well as for the customised abstraction works that will pump water from the river.

“The remote location of the construction site required careful planning and logistical accuracy amongst each of the project stakeholders,” explains Pierre Michallet, senior project manager, Veolia Water Technologies South Africa. Veolia and its EPCM partners, as well as the primary stakeholders of the project – Umgeni Water, engineers and the civil contractors – worked in close collaboration throughout the project to ensure a successful execution and delivery.

Raw water is abstracted from the uThukela River through a boulder and gravels traps system that prevents large matter from being deposited into the water treatment works. The stream is screened as it is split into four canals designed to allow finer sediments and sand particles to settle. The flow is further pumped from the low lift pump station up to the beginning of the water treatment stage, the hydrocyclone. Additional filtering for sediment, grit, organic matter and heavy metals then takes place via gravity using clariflocculators, the Pulsator pulsed sludge blanket clarifier and sand filtration. Underflow sludge accumulated across the treatment processes is dewatered through decanter centrifuges.

As part of the agreement, Veolia was responsible for fostering and developing the relevant professional and technical skills among the region’s communities to be be utilised in the operation and maintenance of the water plant. This included a coordinated recruitment plan to identify locally trained engineers, mechanical and electrical fitters, boiler makers, and other vocations required for the plant’s operation.

Veolia worked with Umgeni Water’s operations teams during the handover period in order to provide a seamless delivery of the plant at the end of July 2017. Provision has been made to scale the plant’s potable water production capacity from 55 up to 110 Ml/day, should it be required in the future.

For more information contact Pierre Michallet, Veolia Water Technologies South Africa, +27 72 077 7008, pierre.michallet@veolia.com, www.veoliawatertechnologies.co.za
Schubert & Salzer stabilises paper production

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

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

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

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

Precise volumetric flows require targeted measures

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

This control circuit, monitoring valve movement internally, ensures that the very highest level of accuracy is achieved between positioning signal and the actual valve position. Activated through an analog positioning signal the positioning time for this valve drive over a 90° rotation can be set in a range of 1 up to 300 seconds. The control system is enclosed in a compact cabinet. In addition, this delivers an analog return signal which can be evaluated by the equipment controls.

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

High control accuracy without hysteresis

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

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

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

For more information contact Kamil Maharaj, Macsteel Fluid Control, +27 31 581 7800, kamil.maharaj@macfluid.co.za, www.macsteel.co.za
How drives help in papermaking

Papermaking machinery, from tissue winders through to suction rolls, embossers, print units and conveyors, must utilise the latest drive technologies to meet modern paper mill production schedules and avoid costly downtime and maintenance issues. The performance levels required of drives in papermaking machines is now way in advance of straightforward functionality. Today’s paper mills are a far cry from the traditional image of yesteryear, where animals or water provided the power. Instead, 21st century mills feature a complex yet efficient series of processes controlled by the latest motors, drives and software. Modern papermaking machines measure up to 150 metres in length and operate at speeds in excess of 100 km/h.

Ethernet for integration

Ethernet is another notable trend, whereby paper mills enjoy the benefits of employing a single network technology from the boardroom to the shop floor. Vertically integrating everything from sensors to accounting software presents possibilities for greater operational control. Simultaneously, the latest Ethernet-based networks permit more flexibility when installing and expanding control systems within the manufacturing process chain in comparison with conventional field buses.

A typical turnkey solution for papermaking machinery would comprise integrated drives, automation, safety and networking. Take a two-ply tissue winder, for example. Forming part of an Active Front End (AFE), advanced drives are able to facilitate class-leading motor performance with real-time Ethernet, while offering a fully integrated safety system in accordance with EN ISO 13849-1.

The drives work and communicate with controller technology, with Ethernet capability offering real-time drive-to-drive synchronisation. Here, the latest drive innovations differentiate themselves with extremely fast current-control algorithms and high switching frequencies. Co-processor modules can also be deployed to perform cascade speed control. More and more manufacturers of tissue and paper-based products are upgrading the drives systems in their production machines to leverage benefits such as on-board advanced motion control, multi-protocol encoder connectivity and savings in cabling.

When looking to upgrade, engineers should take care to not only specify the optimum drive in terms of capability, but one that is completely compatible with the drive being replaced. For instance, the new drive should offer full mechanical compatibility in terms of dimensions and weight. Also, check to see that existing mounting holes can be reused. Engineers will also benefit from ensuring the drive offers the same power and control wiring philosophy, and the same menu and parameter structure with easy transfer of parameters. Typical upgrade projects might include deploying the latest drives for the control of motors in conveyors. Embossers are a further common application, where paper rolls are matched together to make final tissue products thicker and softer. Modern drives can also control print units, as well as winders and unwinders, which deliver materials to further stages of the process.

The effective and efficient driving of induction and permanent magnet servo motors in combination with real-time Ethernet delivery are clearly facilitators of maximising machine throughput. This is supported by high speed I/O for position capture and greater control with single and multi-axis network synchronisation. It has never been easier for machine builders to create more sophisticated and flexible papermaking machinery. All stages of the process can benefit, from suction rolls and paper guide rolls, through to integral dryers.

In support of drives are a multitude of additional module/software configurations that can provide a programming environment befitting of the high-performance motion and functionality necessary in papermaking machinery operations.

Among the many additional benefits of such modules is real-time access to all of the drive’s parameters, plus access to data from I/O and other drives. Tasks are synchronised to the drive’s own control loops to give the best possible performance for drive control and motion.

Papermaking in the Industry 4.0 era

Looking to the near future, in particular the ramp-up to Industry 4.0, the papermaking industry is preparing for the transition using intelligent drive and motor solutions that are able to play a key role in collecting information and providing the first line of processing. This data can then be converted into useful information for a diverse range of applications, such as predictive diagnostics, process optimisation and machine-to-machine integration.

So, what capability currently exists in this respect? A number of modern drives and motors enable smarter energy use by measuring and optimising consumption. Furthermore, drives are frequently connected to process-critical external sensors such as flow, temperature and position. Drives can also generate critical process information such as speed, torque and current, while digital encoders can provide data to enable automatic drive configuration and measure factors that include vibration. The boundaries to what paper mills can achieve using the latest drive technology are almost without limit.

For more information contact Erisha Munnhar, Nidec Industrial Automation Southern Africa, +27 11 462 1740, erisha.munnhar@mail.nidec.com, www.nidecautomation.com
In the pulp and paper industry, the alkaline sulphate process, which is where fibrous material is separated from lignin, is important. These chemicals need to be recycled, due to environmental and economic reasons, so it is vital that this process runs smoothly.

To get it wrong can cause complications and cost time and money.

SensoTech’s LiquiSonic analysers monitor the process

What actually happens?

Lignin, an organic material, and others like it, are removed through a process that concentrates and burns the black liquor. What is produced through this recovery process is a smelt with high salt content as well as energy, providing the base material for green liquor. The sodium carbonate in green liquor, through the causticising with lime, is converted to sodium hydroxide, which is reused in white liquor for the next pulping process.

The LiquiSonic analysers monitor each step inline, in an optimal manner, which leads to productivity increases as well as optimised quality control.

What are the applications?

• Green liquor concentration is monitored in real-time.

• In different processes, phase detection and separation occurs.

• Black liquor evaporation monitoring.

• Control of incoming goods.

• Control of recycled white liquor.

What are the advantages?

• Steam washing is not necessary as it is layer free.

• Laboratory costs are reduced.

• In causticising, there is ideal dosage of lime.

• Maintenance free processes even with high temperatures (200°C) and liquors with high coating.

• No dismounting and remounting required for cleaning or maintenance.

• Accurate inline concentration measurement for black, white and green liquor.

• Enhanced operational safety.

For the high demands that are placed on sensor technology in the pulp and paper industry, SensoTech sensors have been built to withstand the harsh working environment and can be adapted to existing process conditions.

For more information contact Morten Controls, +27 86 100 0393, john@mortoncontrols.co.za, www.mortoncontrols.co.za
Robust design allows consistency measurement in digester applications

Harsh process conditions have historically prevented the use of mechanical consistency transmitters in Kamyr continuous digester blow lines. The mechanical design of existing transmitters has not been robust enough to survive the unusually high flow rates enforced with uncooked chips and knots, high chemical concentrations with pH exceeding 13, temperatures above flash point as well as rocks and debris.

Traditionally the operators have made some estimation of the consistency by monitoring the current of the scraper motor, or by measuring the differential pressure at the outlet device at the bottom of the digester. While neither measurement has been adequate for the control of cold blow flow, they were used as an indication.

The KC/3 for severe process conditions

ABB Oy, KPM has developed a new consistency transmitter which finally meets the challenge. This blade type transmitter, called KC/3, is made of a solid titanium body without any seals, O-rings or gaskets. This leak-proof design can safely be installed in very severe process conditions, including blow lines and blow tank outlets.

Stora Enso in Oulu, Finland installed a KC/3 in its pulp mill blow line. The installation was straightforward as all required hardware was included in delivery. The special protective deflectors designed for blow line applications with detailed installation and welding instructions are part of the delivery.

The benefits

Occasionally the production rate can drop due to disturbances in flow internal to the digester e.g. chip column movement can stop because of channelling in the washing zone. This will immediately cause serious quality problems. Chips are over cooked, strength properties suffer, and, of course, production rate drops as a result of lower blow consistency.

Having a reliable consistency measurement in the blow line, the operator is warned immediately about a disturbance and can react swiftly. He could, for example, temporarily reduce the flow in washing circulation or change the locations of the wash liquid feed.

During normal run, the differential pressure at the bottom, scraper current and consistency track each other fairly well. The pressure difference does not see the consistency drop but on the contrary indicates higher numbers. Shortly thereafter, the scraper current of the diffusion washer proves that consistency really has dropped. In addition to prompt and reliable information of process disturbances, the production rate calculation becomes more accurate.

This helps to track and control the grade changes to the screening and washing stages. Reliable and exceptionally strong the KC/3 when installed in a blow line provides an important measurement to assist the operators with digester control.

For more information contact Guy Watkins,
UIC Instrumentation, +27 31 468 2561,
guyw@uic.co.za, www.uic.co.za

Telco sensors for stockyard control

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

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

For more information contact Gail Norton
Instrumentation, +27 31 701 4861,
telco@telcosa.co.za,
www.gailnortoninstrumentation.co.za
Safety temperature measurement device for boilers

The Safety-TL4896, a SIL2 rated temperature measuring device from Martens, conforms to international boiler regulations and offers a unique front panel installation. Certified to DIN EN14597 and DIN EN61508, the device gives an analog actual value output for regulators and PLCs that eliminates the need for additional sensors. It is available from GHM Messtechnik South Africa.

“The Safety-TL4896 is the first safety temperature measurement device in the world designed specifically for application in industries using boiler technology,” said GHM Messtechnik South Africa managing director, Jan Grobler. “I believe the device will generate enormous interest from plant operators in sectors such as pulp and paper, food and beverage, pharmaceutical, sugar and dairy.

“The device operates as a direct indicator as it is installed in the control panel instead of on the top-hat rail, thus eliminating the need for an additional indicator. An additional advantage is the execution of the reset function directly on the device, removing the need for an additional control element.”

In boiler applications for hot water production, a safety temperature limiter must be provided in addition to the limit value and minimum water level monitors in order to suppress the energy supply in accordance with DIN EN 12828 – whether by means of deactivating the automatic firing device with ignition flame monitoring (gas operation) or a safety valve (oil supply) or a heating current interruption – as soon as any of the limiters react. With self-sufficient device technology as required by DIN EN 61508

“Functional Safety”, i.e. independent of PLC, regulating or scada systems, only the permissible safety temperature limiters are used for industrial heat generators in accordance with DIN EN 14597, and the functional safety level requirements in accordance with SIL2.

Combined heat and power plants require safety temperature limiters for self-sufficient monitoring of the hot water, over-temperature of motor preheating, motor cooling water, exhaust gas and calorific value heat exchangers. In hot steam production, additional safety elements must be used in order to monitor boiler systems equipped with over heaters.

The solution

The Safety-TL4896 safety temperature limiter has a safety shutoff contact and an adjustable pre-contact in order to warn of impermissibly high actual values independently of the regulating and control device.

Before the forced shutoff is activated, additional alarm messages can be issued and corresponding functional processes can be initiated in order to achieve a safe standby status, eliminate errors and avoid time-consuming and costly shutdowns and subsequent restarts of the plant. The high-quality analog output of the actual process value offered enables further processing in the automation system and eliminates the need to install an additional sensor.

The benefits

Electronic safety temperature limiters were previously often built as top-hat rail devices in switch cabinets. Now, for the first time, the device offers installation in the front panel. In the process, the actual and limit values on the large display can be read conveniently and the reset process, after correction of the cause of an error, takes place on the front panel in the same manner as for all other operating processes. As a result, separate devices and their wiring can be eliminated as their functions are already integrated: indicator and reset button.

With the adjustable pre-alarm, no additional limiters are needed and redundancy to the automation unit is provided. A second additional measuring chain is eliminated by the analog output. The Safety-TL4896 can be configured with the front buttons and tailored to the specific application.

Summary

Particularly with small and compact systems whose complete automation electronics are contained in the operating device (e.g. with use of the GHM-One multi-function device, or a compact industrial PC/PLC system), there is no longer a large, conventional traditional switch cabinet. As a self-sufficient front panel unit in slim DIN format 48x96, the new Safety-TL4896 enables consistently compact design of modern small systems, reduces the wiring and facilitates ergonomic operation in the monitoring and observance of safety requirements.

The unit also offers time and cost advantages in wiring and installation. With easy operation from the front, the requisite safety functions and ergonomic operation of safety temperature limiters is fulfilled for the first time.

For more information contact
Jan Grobler, GHM Messtechnik,
+27 11 902 0158, info@ghm-sa.co.za,
www.ghm-sa.co.za
SIL2 for UWT’s rotating paddle series

The terms ‘functional safety’ and ‘safety integrity level’ (SIL) have occurred more frequently since the publication of the international standard IEC 61508/ IEC61511. Particularly in systems with hazard-causing processes, such as in chemical plants, the consideration of functional safety has become indispensable. On this basis, safety-related practices, design principles and error considerations must be met in order to minimise the risk of dangerous failures.

Rotary paddle level switch for overfill and dry run protection

The UWT engineers focused on this topic and redesigned the rotating paddle switch of the Rotonivo RN 6000 series according to the normative requirements of functional safety, to ensure safety functions in risk mitigation in accordance with SIL2. Typical functions include overfill and dry-run protection.

Depending on the requirements, the paddle switch is used as a full, demand or empty detector in storage silos or process vessels, and is suitable for use in almost all solids. With its simple electromechanical measuring principle it can also be adapted for extreme process conditions. A motor driven shaft causes the vane to rotate. Once the material level reaches the vane, thereby inhibiting further rotation, this creates a torque, which is converted to an electric signal. Once the vane is again free of the material, the output signal is reset and the motor driven shaft rotates freely once more.

As part of the functional safety issue, the electronics of the rotating paddle series have been redesigned. It has been reconfigured so that any failure of electrical components leads to a safe switching state of the output signal and thus a hazard by the system is avoided.

The innovative SIL2 compliant Rotonivo RN 6000 series now gives operators of safety-related systems a sensor in accordance with their specified safety integrity level along with an efficient level measurement transmitter.

Pressure measurement with dual display

The PSQ series dual digital display pressure sensors from Autonics allow users to monitor both PV and SV readings. The 12-segment LCD display is capable of displaying various alphanumeric characters for clear identification, and the main (PV) display can be displayed in three different colours, depending on operation status or configuration. The secondary (SV) can display set point, pressure unit, or can be turned off completely.

The dual display pressure sensors feature various functions and features to ensure accurate pressure measurement and easier status monitoring. They offer a wide compound pressure measurement range from -100 to 100 kPa, for measurement of negative or positive pressure with a single unit. The instruments also support eight different pressure units and the main (PV) display can be set to show red, green, or orange colours depending on configuration.

Users can easily switch between NPN and PNP open collector outputs by simply selecting the desired option in parameter settings. With the auto shift function turned on, when there is change in the initial pressure the external input adjusts the determined level to match the change in pressure. The copy parameter settings function allows the parameter settings from the master unit to be copied directly to any slave unit, reducing time for configuration when multiple sensors with identical settings are required.

The PSQ series pressure sensors are available in fluid type (gas, liquid, oil) and pneumatic type (gas only) with various connector and cable types. The compact size allows easy installation even in tight or limited spaces and the one-touch, push-to-connect wiring offers easier connection and maintenance.

Autonics Corporation is a leading manufacturer and exporter of industrial automation products in South Korea. With strategic plans to increase distribution of its products and services to southern Africa, the company is looking for qualified local distributors as partners.

For more information contact Dean Choi, Autonics Corporation, +82 51 519 3232, sales@autonics.com, www.autonics.com

For more information contact Morton Controls, 086 100 0393, sales@mortoncontrols.co.za, www.mortoncontrols.co.za
Kobold’s new model EPS electromagnetic flowmeter has a standard accuracy of ±0.3% of reading stability of zero. The new developed, microprocessor-controlled UMF2 converter guarantees highest accuracy and is easy to operate via its alphanumeric backlit LCD terminal with six keys, plain text response and plausibility check of entries. Empty-pipe detection, coil current monitoring and plain text error messages guarantee full control over sensor and measuring point at any time. Pulse, status and current outputs, as well as HART communication, are standard features, all of which are electrically isolated. Lining materials, such as hard rubber, soft rubber, EPDM, ceramic, PTFE or PFA, are available. A wide range of standard and special electrode materials are on offer, including stainless steel, Hastelloy, platinum, titanium and tantalum. The EPS is available for nominal diameter from DN10 ... DN1200 and flow velocities up to 10 m/s.

The main features of the EPS are:
• High accuracy: 0.3% of actual.
• Maintenance-free.
• No pressure drop.
• Numerous lining materials.
• Numerous electrode materials.
• Low-cost grounding electrode instead of earthing rings.

The EPS is used to measure the volume flow of liquids, slurries, pastes and other electrically conductive media without any pressure drop. Pressure, temperature, density and viscosity do not affect the volume measurements. However, solid particles and small gas bubbles should be avoided.

**Level measurement is becoming more sophisticated**

Since radar was developed and deployed during WW II, its use has expanded enormously. As technology advances, these uses are also advancing. For example, radar technology is used in the motor industry to assist in detecting objects near a car or truck, for warning systems. Radar can also detect if a person has fallen overboard from a cruise ship, while the construction industry uses radar to test concrete viability and strength consistency.

When it comes to level measurement, radar offers accuracy and efficiency, which is essential for safety, stock inventory and processing. Radar is exceptionally robust and can be used in any weather or environmental conditions, as well as for nearly every temperature range and viscosity of the measured medium. Deon Rampathi, sales manager for Krohne, says, “Accurate, consistent measurement is essential and radar technology delivers just that.”

**Applications are becoming smarter**

The world is becoming ‘smarter’ and solutions need to fit into applications that have become increasingly tech-savvy, as well as more automated. Smarter measurement enhances the safety, sustainability and efficiency of operations. This extends into more reliable and enhanced up-time as well as the extension of equipment service life.

“We’ve introduced the Optiwave 7500, a powerful radar measurement tool that is geared towards those hard-to-reach situations,” adds Rampathi. “It’s a new generation of liquid measurement with better performance, enhanced software and a more powerful signal processor.”

The Optiwave 7500 has an 80 GHz FMCW radar level transmitter to handle liquids in narrow tanks with internal obstructions. The flush-mounted Peek Lens antenna means there is no tank intrusion. It is also insensitive to deposits and has a small dead zone and beam angle (4°) with flange plate protection for corrosive media and a 112 mm antenna extension for long nozzles. Accuracy is 2 mm and there is an extensive choice of process connections with measuring distances up to 100 m at temperatures up to 1500°C.

“For our customers who want to keep their existing antennae and upgrade the electronics without losing the hermetic seal on the tank, there is an Optiwave 7500 retrofit option,” concludes Rampathi.

To download the Krohne whitepaper on level measurement visit www.instrumentation.co.za/paper/j3762.pdf

---

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

**For more information contact**
Deon Rampathi, Krohne SA,
+27 11 314 1391, d.rampathi@krohne.com, www.za.krohne.com
Digital conductivity sensor with IO-Link

Jumo digiLine is the bus-compatible connection system for digital sensors in liquid analysis. The digiLine sensors for conductive (CR) and inductive (Ci) measurement of electrolytic conductivity are new to the range, supplied in a unique variant with an IO-Link interface.

The digiLine range allows for operation of up to six digital sensors on the Jumo Aquis touch S (P) transmitter or up to 62 on the mTron T measurement, control and automation system. Both the operation of individual measuring points, as well as the setup of extensive sensor networks, is possible. Automatic integration into the digiLine sensor network with the intelligent plug and play software tool makes start up easy.

The conductivity measurement devices supplement the Jumo digiLine sensor range, which up until now covered measurements for pH, redox, temperature, dissolved oxygen, turbidity, as well as water disinfection variables such as free chlorine.

The applications are universal with versions available for all water qualities, ranging from ultrapure in pharmaceutical applications, to injection (WFI) quality with conductive values from 0.05 µS/cm to measurements in highly concentrated liquids of up to 2000 mS/cm. Tried and tested analog sensors in the hygienic or standard design type are enhanced with Jumo digiLine electronic components to become intelligent smart sensors.

The Cr/Ci sensors are available with integrated electronic components or detached electronic head and cable connection. The detached version can easily master problematic installation situations, such as heat emission or vibration.

An RS-485 interface with extended Modbus protocol serves as the digiLine interface allowing integration into standard Modbus RTU networks. This is one of the first electrolytic conductivity measurement devices to be integrated in machines and plants with IO-Link infrastructure.

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

Foxboro new pH 12 Sensor Technology @ Work

New pH 12 Smart Sensor

Smart Sensor technology allows the calibration process to move from the field or plant process environment, to the laboratory or instrument shop, where the calibration procedure can be carried out in a controlled environment. When the sensor is returned to the field, the sensor parameters are automatically uploaded to the transmitter.

PH12 smart sensor is available in a 12-mm form factor, PG 13.5 process connection. With sterilizability, biocompatibility and sanitary compliance the sensor is ideally suitable for the food and beverage, pharma and biotech industries.

1. The sensor has integral electronics enabling digital communications and stores manufacturing information, calibration, and diagnostic data.
2. The sensor is suitable for applications with Smart ORP and simultaneous Smart pH+ORP requirements.
3. The FIT12 Insertion/Reaction and BVA (Ball Valve Insertion assemblies) with replaceable bushings and tees available for faster and safer sensor insertion and removal.
Flush-mount pressure transmitter

Specifically developed for the supervision of clean rooms, the Kimo CPE 300 transmitter is dedicated to the measurement of low pressure or depression of air or neutral gasses from 0/10 Pa to -1000/1000 Pa.

The flush mount device offers the advantage of easy integration into walls and provides a high standard of cleanliness thanks to its brushed stainless steel or white lacquered casing.

The instrument is equipped with two visual LED and two audible buzzer alarms, 4-20 mA or 0-10 V output, RS-232, 2 RCR relays (6 A/230 V AC), configurable intermediate and centre zero ranges, external transmitter inputs, output diagnostics, interchangeable measuring sensor (SPI technology) and a large display for front face calibration.

The digital communication (RS-232 and Modbus RS-485 protocol) allows – in addition to pressure measurement – the display of two other parameters such as temperature, humidity, velocity or airflow.

Raytek pyrometer sensor now in 4-20 mA

About a decade ago, Raytek introduced the CM, a compact, integrated IR non-contact thermometer intended for quick and seamless replacement of J and K-type thermocouples. The CM, still an industry favourite, is used for temperature monitoring in a wide range of industrial manufacturing processes and OEM applications. This rugged, IP65 sealed, single-piece integrated sensor offers powerful features to handle nearly any temperature measurement requirement.

Designed for easy integration, the sensor can easily replace traditional J or K-type contact probes. For applications susceptible to noise, a user-scalable 0-5 V version is also available. In addition, a 4-20 mA converter for the 0-5 V version was recently developed by R&C Instrumentation. The converters are locally assembled at the company workshop in Modderfontein, allowing customers, who order the 0-5 V version with the converter, to get pyrometer range scaling if required.

The sensor includes high-resolution silicon optics, which provide excellent optical resolution an attractive price. An RS-232 digital interface allows the user to configure all programmable sensor variables via the powerful Raytek DataTemp Multidrop software. These include a 24 V DC alarm output, triggered by target temperature or head ambient temperature; peak hold, valley hold or variable averaging signal processing; adjustable target emissivity settings, and adjustable window transmissivity setting. A built-in sensor health LED provides a convenient on-line indicator of the sensor’s operating status and aids in troubleshooting initial sensor setup.

The instrument’s remote configuration capability allows it to be configured for virtually any application, reducing installation and troubleshooting time, and streamlining data acquisition. This feature also eases troubleshooting when the sensor is located in hostile or remote locations.

The Raytek CM sensor is designed to measure target temperatures ranging from -20 to 500°C. The on-board electronics are protected by a rugged IP65 stainless steel housing, allowing the sensor to function in ambient temperatures to 70°C without cooling.

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

For more information contact
R&C Instrumentation,
086 111 4217, info@randci.co.za,
www.randci.co.za.
Temperature sensor with drift monitoring

The sensors of ifm electronics’ TAD series have two resistance elements with different characteristics (PT and NTC) that monitor each other permanently in the process. Drift is immediately detected and signalled, which increases the process reliability. All three process values (mean, PT element and NTC element) can be documented via IO-Link. This ensures permanent transparency for quality management, while calibration intervals can be adapted or dispensed with.

Precise 5-point calibration from the factory
Due to a 5-point temperature adjustment during the production process, the TAD temperature sensor features an accuracy of 0.2 K in the range from -10 to 130°C. Visit ifm at Electra Mining Africa Expo 10-14 September in hall 7, stand C01 to view live product demonstrations as well as other new and innovative technology offerings.

For more information contact ifm electronic SA, 086 143 6772, info.za@ifm.com, www.ifm.com

Innovative compact orifice plate

Compact orifice plates can be used without difficulty for the measurement of liquids, gases and vapours. WIKA’s new compact orifice plate Model FLC-CO enables direct mounting of differential transmitters.

Differential pressure flowmeters are used in many technical applications. As primary flow elements, orifice plates represent the most common solution. Orifice plates are notable for their easy installation and management. The differential pressure generated by the primary flow element is normally transformed into an electrical signal proportional to the flow rate by a differential pressure transmitter.

Compact orifice plates enable the simple assembly of the measuring arrangement as a plug-and-play solution, through which significant cost savings can be achieved. Differential pressure transmitters and valve manifolds are attached via compact pressure points, eliminating the need for differential pressure lines.

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

KROHNE South Africa
8 Bushbuck Close, Corporate Park South
Randjespark, Midrand, Tel.: +27 11 314 1391
Fax: +27 11 314 1681, Deon Rampathi, d.rampathi@krohne.com, www.za.krohne.com

fact

Flow measurement in partially filled pipes

TIDALFLUX 2300 F – technology driven by KROHNE
- Electromagnetic flowmeter with integrated contactless level measurement
- Minimum fill level only 10% of pipe diameter
- Sensor and converter approved for Ex zone 1
- Broad diameter range up to DN1600/64”
- High abrasion and chemical resistance

products
solutions
services

KROHNE South Africa
8 Bushbuck Close, Corporate Park South
Randjespark, Midrand, Tel.: +27 11 314 1391
Fax: +27 11 314 1681, Deon Rampathi, d.rampathi@krohne.com, www.za.krohne.com

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

Compact orifice plates enable the simple assembly of the measuring arrangement as a plug-and-play solution, through which significant cost savings can be achieved. Differential pressure transmitters and valve manifolds are attached via compact pressure points, eliminating the need for differential pressure lines.

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

KROHNE South Africa
8 Bushbuck Close, Corporate Park South
Randjespark, Midrand, Tel.: +27 11 314 1391
Fax: +27 11 314 1681, Deon Rampathi, d.rampathi@krohne.com, www.za.krohne.com
Digital has become business-critical and is deemed the biggest shift for humanisation since the Industrial Revolution. Unfortunately, businesses and employees do not understand what digital transformation entails and therefore, we find only 47% of global companies are currently embarked on their digital transformation journey.

Digital transformation is defined as ‘the investment in, and development of, new technologies, mind-sets and business and operational models to improve work and competitiveness and deliver new and relevant value for customers and employees in an ever-evolving digital economy.’

Digital transformation is not just about the technology, but about new ways of working.

Before embarking on a digital transformation journey, a company must acknowledge that multiple dimensions should be considered. The five dimensions of digital transformation for RCL Foods are identified as: company culture, empowered teams, customer experience, innovation and data as a strategic asset. The way in which each aspect is perceived and managed would likely determine the outcome and strategic direction of the organisation, ultimately to assist a sustainable solution for digital transformation.

At RCL Foods we embrace digital transformation and are making progress towards managing each dimension.

1. Our culture
   Our company culture is all about more impact: being braver, more curious, more open, faster, and ultimately, being more ‘Us’. Our culture embraces seeing and doing things differently, we acknowledge that digital cannot be owned by one person, but should be embedded as part of the culture. We strive to involve everyone through intrapreneurship (internal entrepreneurship).

2. A team of teams
   RCL Foods recently opened a studio to encourage collaboration and creative thinking to drive solutions. The studio is open to anyone in the organisation and holds weekly meetings to ‘lunch and learn’, hosted by the dedicated studio team under the lead of digital marketing manager, David Pugh. The idea is to encourage the creation of a team of teams within the organisation, aiming to embed digital thinking into individuals within the teams. As Stanley McChrystal writes in his book ‘Team of Teams’;
   “Leaders should be gardeners. You are not playing a game of chess where you dictate every move. You create an environment where every piece can simultaneously grow, like a gardener.”

3. Customer experience
   Instead of looking for ideas and getting stuck on tools or technology, we aim to solve problems and ultimately improve the overall customer experience. An idea can be great, but without a need addressed, customers would not be queuing for the solution.

4. Innovation
   We see and do things differently. We are on a journey to change the way we innovate – to test quickly and fail smart. We aim to test ideas, as opposed to implementing a full solution. First test the existence and viability of a customer need, then work on the full solution. We look to go from a maximum validated product to a minimum viable product. If an idea does not work, we find this out quicker – we fail smart.

5. Data
   Finally, we bring everything together through data. One of the biggest challenges companies face today, is to turn data into a strategic asset. Be sure to ask the correct questions – watch and listen to your customers. Once you understand their needs, you will know which questions to ask and what data you need to answer each.

   Digital transformation is changing the way in which companies operate, and sometimes, even how companies are structured. To embrace the change, we need to be fully prepared for change, and embrace each individual’s ideas within a company. The digital transformation journey should start with a change in the mind-set of top leadership; we require buy-in from all business and operational levels. Digital transformation can only be successful if everyone is involved. So make sure you go all in – there has never been a better time.

For more information contact Hilde Volschenk, RCL Foods, +27 31 242 8595, hilde.volschenk@rclfoods.com, www.rclfoods.com
Plant Security Lifecycle Services
Securing Your Plant Information

Our Plant Security Lifecycle Services help customers reduce security risks and manage plant security throughout its life.

YOKOGAWA  Co-innovating tomorrow™
Industrial control system cybersecurity

Part 5: ICS network segmentation.

In the last three articles on cybersecurity in ICS environments, we have covered risk assessments, asset discovery and vulnerability management, environment hardening and security monitoring. In the penultimate article, we will cover network segmentation in ICS networks.

Historically, many ICS/engineering departments were not focused on protecting the inside of their networks, only the perimeter was protected with the firewall being seen as the single line of defence against the malicious insiders, third-party vendors and the bad guys from the outside. This strategy, while effective for its day, does not hold true in the modern digital world. Today’s attacks are being facilitated by large and well-funded groups of cyber criminals looking to steal intellectual information, stop production and extort companies. Once access is gained by breaching the perimeter, these cyber criminals are able to move freely within your network. This is why it is strongly recommended to implement a network segmentation framework.

Splitting up the network
ICS network segmentation is the process of splitting up your network into different segments or sub-networks, to improve performance, but more importantly, to make it more difficult for an adversary to freely move around if they compromise a part of your network. To define this further, it is the process of grouping similar assets and then enforcing a segment between the levels both above and below.

To put this into perspective, Target Corporation, a leading USA retailer, lost 40 million credit and debit card numbers in December 2013. The first part of this compromise is that the cyber criminals stole credential information from a third party HVAC supplier. The second part is that these credentials were then used to gain access to the Target Corporation network. The third part is that once the cyber criminals gained access they targeted the POS systems, by installing malware on them. There is more to this incident (an entire article on its own), but it does highlight the need for strong effective network segmentation. If there was proper network segmentation between the POS network, the third party network and the main corporate network, it would have been much more difficult to steal the information.

Purdue Enterprise Reference Architecture
One of the most commonly used models is that of the Purdue Enterprise Reference Architecture model, more commonly known as PERA or just the Purdue model. I strongly urge all of those responsible for ICS cybersecurity to review this method. It was developed by the Industry-Purdue University Consortium for Computer Integrated Manufacturing, and has been widely adopted by major industrial control system cybersecurity frameworks such as NIST 800-82 and ISA/IEC 62443.

From a hierarchical view the model is comprised of 6 levels and 5 zones. The 6 levels are:
• Level 0: Process.
• Level 1: Basic control.
• Level 2: Area supervisory control.
• Level 3: Operations and control.
• Level 4: Business planning and logistics.
• Level 5: Enterprise network.

And the five zones being:
• Enterprise zone.
• Demilitarised zone (DMZ).
• Manufacturing zone.
• Cell/area zone.
• Safety zone/Safety Instrumented System (SIS).

The diagram is a very basic control network depicting how the Purdue model should logically be implemented.

One aspect to take note of from the diagram is that no control system protocol should traverse the ICS network into the enterprise or business network. All too often we still find ICS traffic on the IT network(s), which not only slows down network performance by having unnecessary traffic ‘on the wire’, but also provides huge security risks as these protocols have no, or very limited, built-in security. If ICS traffic is absolutely required to traverse the ICS network through to the IT network, ensure that is it strictly controlled.

Each ICS system is different and requires certain tweaks and changes to the customer’s specific ICS network segmentation framework. Where the Purdue model helps is that it assists in designing a base framework which you can then build on. As I’ve stated previously, there is no ‘one size fits all’ framework that is right for everyone, and there are other models that you might want to consider to suite your organisation’s needs. The Industrial Internet of Things (IIoT) and Software-Defined Networking (SDN) is also changing the way we see and segment our networks.

Tommy Thompson

Tommy Thompson is a passionate cybersecurity professional with some 15 years’ experience. Starting as a firewall engineer in 2001, Thompson has assisted a variety of companies in numerous roles with their cybersecurity problems. He holds a BComm degree in Information Management from Oxford Brookes University (UK) and he is certified by PECB (Canada), as a Scada Security Professional (CSSP).

For further information contact Tommy Thompson, +27 (0)11 463 0096, tommy@nclose.com
Schneider Electric is dedicated to the deployment of digital technologies in mining to address the rising pressures on business sustainability and reduced energy consumption.

“The organisation has invested significantly to develop a specialised competence in mining applications,” explains Marc Ramsay, vice president industry business unit at Schneider Electric South Africa. “We believe that technology integration combining energy management, process automation and software through our IoT enabled platform, EcoStruxure, leverages an enabled, open and interoperable architecture to deliver true digital transformation. EcoStruxure enables customers to maximise the value of data and edge control, which translates into actionable intelligence for better business decisions. “One of the challenges has always been to make real-time decisions based on information that is spread across disparate databases locked within mining hierarchical disciplines. With that in mind, we believe that our technology provides a high level of value through breaking down operating silos both vertically and horizontally across the mining value chain. Connected devices can now be safely and reliably accessed from the cloud and product deliveries can be traced in real-time.”

**A truly unique time in mining**

“Operational efficiency is still below global benchmarks and plagues our mining industry,” outlines Ramsay. “The management of asset utilisation is a core focus for Schneider Electric’s mining team. Whether we are reducing the mean time to repair of our medium voltage switchgear, or using augmented reality for embedded equipment fault diagnosis, we are dedicated to reducing operating costs and improving the efficiency of equipment and workforces. “We believe that an important aspect of digital transformation is the human aspect, and while autonomous operation continues to be a compelling and necessary aspect of mining operations, future workforce integration should not be neglected. Already our customers are benefiting from the adoption of EcoStruxure Augmented Operator Advisor, which combines contextual and dynamic information for mobile users. The technology enables them to experience a fusion of the physical environment with an added layer of virtual objects and critical information. “The mining industry is also a large consumer of electrical energy. Our mining teams work with customers to manage their energy footprint and consider all aspects of the efficiency of the mining process to serve this requirement. Schneider Electric has been delivering complete solutions for the mining industry from low and medium voltage equipment, to transformers and grid automation, for over 150 years. The latest integrated IoT-enabled power management architectures enhance connectivity, network security, real-time operational reliability, and smart analytics for peace of mind and significant financial benefits.”

According to recent studies conducted by independent research companies, autonomous and mechanised mining can have a significant impact on extending the economic life of existing operations, as well as the profitability. But one needs to be cognisant of the impact on jobs, despite the improved safety related aspects of autonomous operations. Schneider Electric has already experienced digital transformation in its own teams and the impact that a digital frontier requires on different working methods. Therefore, the technologies it develops are always with the digital worker in mind, along with the built-in capability to integrate a mobile or transient workforce. Studies have documented that the workforce of the future will on average not stay in their jobs for more than 36 months, and this transition will be amplified in the mining environment, which requires a new level of induction and orientation, along with the workforce having on-hand access to latent or ‘hidden’ operational knowledge. The good news is that digitisation is not only driving operations, but also enabling internal research and development teams to incorporate previously inaccessible technologies in a plug-and-play fashion. Open standards and the adoption of industry protocols has always been the company mantra.

“Of all the trends impacting the mining industry, few will be as critical as effective digitalisation,” concludes Ramsay. “It will affect every aspect of industrial operations and provide the greatest potential for improving business and operational efficiency. The rewards are significant for those willing to explore the potential. It has been estimated that in the next five years, mining industry leaders will achieve their most significant improvements by embracing digital technologies such as the IIoT, advanced analytics and augmented reality that harness the power of big data in a secure way.”

**For more information contact**

Prisca Mashanda, Schneider Electric SA, +27 11 254 6400, prisca.mashanda@schneider-electric.com, www.schneider-electric.co.za
Emerson empowers top quartile performance in manufacturing

Plantweb digital ecosystem provides new mobility and decision-support technologies.

As manufacturers accelerate digital transformation and workforce evolution, Emerson has unveiled significant enhancements to its Plantweb digital ecosystem, a comprehensive Industrial IoT automation platform.

“Manufacturing jobs are rapidly becoming data-centric roles, requiring immediately actionable information for experts across the enterprise,” said Peter Zornio, chief technology officer for Emerson Automation Solutions. “Through a deep understanding of customers’ vision for organisational effectiveness and business performance improvement, Emerson is innovating breakthrough products and services to accelerate that organisational transformation.”

Identify clear business objectives

A 2017 Industry Week survey of manufacturing leaders revealed more than 60 percent of those surveyed indicated active pilot projects in IIoT, but only five percent identified clear business objectives at the heart of their programmes. Of the 205 industry executive respondents, 34 percent stated that lack of clear technology strategy was a barrier while 61 percent confirmed that a scalable approach to investment is preferred.

“A clear message from the industry is that a one-size-fits-all, vendor-prescribed IIoT approach won’t work,” continued Zornio. “They want to identify specific business challenges, target technology to improve performance and then scale up their investment based on results achieved. That is why we have architected Plantweb to enable companies to get started where they can gain the greatest near-term impact.”

Plantweb offers scalable solutions

Built on the foundation of best-in-class process control and safety systems, Plantweb expands on existing automation infrastructure to make the promise of IIoT scalable and achievable, with a broad portfolio of pervasive sensing technologies, an extensive suite of analytical software tools, secure and robust data infrastructure devices and expert services.

During the 2017 Emerson Global Users Exchange event in Minneapolis, Emerson introduced extensive enhancements to the Plantweb digital ecosystem portfolio, including:

- **Pervasive Sensing:** Emerson’s Pervasive Sensing is the foundation of the Plantweb digital ecosystem, providing enhanced visibility into process performance and asset health, so experts have the information needed to drive operational improvements.
- **Secure First Mile:** As global adoption of the IIoT increases demand for robust cybersecurity strategies, Emerson’s Secure First Mile provides secure transfer of actionable data from OT systems to authorised Internet-based applications, services or mobile users.
- **Plantweb Insight:** Emerson’s Plantweb Insight is a scalable and lightweight, Web-based software platform that helps users make sense of plant data by leveraging sensing technologies and prebuilt analytics to provide relevant-time monitoring and identification of abnormal situations for specific asset classes.
- **Plantweb Advisor:** Emerson’s Plantweb Advisor is a scalable set of software applications that utilise deeper analytics to provide reliability and energy specialists with critical information about equipment health and efficiency as well as energy consumption and emissions.
- **Always Aware:** Formerly known as Always Mobile, Emerson’s new Always Aware suite of solutions builds on previous mobility capabilities, expanding them to focus on delivering role-based, relevant-time information and alerts to plant personnel, regardless of locations, enabling more effective collaboration and driving actions to improve asset and process performance.
- **Services:** Emerson is expanding its role as a trusted industry partner with consulting and service offerings that complement its leading portfolio of automation and IIoT-based technologies.

To help customers understand the impact these new technologies can have on personnel productivity and organisational effectiveness, Emerson brought the next-generation digital workforce to life with the ‘Digital Workforce Experience’ during Emerson Exchange. The immersive, role-based simulation demonstrated first-hand how various manufacturing roles are evolving and the impact they have on business performance.

“The industry’s technology evolution over the past 30 years has delivered tremendous improvements in efficiency,” Zornio said. “Now it’s time to fuel the next-generation workforce with the actionable insights they need to become even more strategic assets in their companies.”

For more information contact Rob Smith, Emerson Automation Solutions, +27 11 451 3700, rob.smith@emerson.com, www.emerson.com
CHANGE THE WAY YOU LOOK AT ASSET HEALTH WITH EMERSON’S PLANTWEB™ OPTICS COLLABORATION SOFTWARE ASSET MANAGEMENT PLATFORM.

What if you could....

**Manage your priorities instead of chasing the unexpected.**
When you are drowning in data, you need a way to prioritize your assets and their performance so you can focus on the real troublemakers. The Plantweb™ Optics Collaboration Software Platform acts as your personal time manager – culling through mountains of data to find the important information and put it in your hand. Now you can point your limited resources in the right direction.

**Alert the right people before trouble strikes.**
If you can’t easily share information with your team, developing problems can go unresolved. You need to keep the right people informed, especially when a situation is developing quickly. The Plantweb™ Optics Collaboration Software Platform delivers alerts using the Asset View mobile app, so your team can collaborate on the actions necessary to avoid downtime in the plant.

**Make the right call at exactly the right time.**
When you aren’t able to accurately predict equipment failures, you lose profits, production, even confidence in your maintenance program. When you have insight into the production assets in your facility, you can make the real-time, informed decisions necessary to maximize availability and reduce unexpected interruptions. The Plantweb™ Optics Collaboration Software Platform alerts you to those situations that need your attention so you can take charge.

**Plantweb™ Optics Collaboration Software Asset Management Platform**
Share asset health information from everywhere in the plant to anywhere you are.

AUTOMATION & CONTROL SOLUTIONS
+27 (0)11 249 6700 • 0861 257 738
rfq@aveng-ac.s.com • orders@aveng-ac.s.com
www.aveng-ac.s.com

Complete Process Control Solutions
Standards committees and other industry groups have developed and promoted several conceptual models that describe a stepwise approach to cybersecurity for industrial control systems (ICS). These models address the people, process, and technology elements of the cybersecurity response.

Before any of these recommendations can be implemented, managers must first understand and accept the risks they face and the potential consequences. An understanding of human behaviour can help.

The Kübler-Ross model (often referred to as “The Five Stages of Grief”), describes a progression of emotional states associated with traumatic events. This model offers an interesting way to understand (and thus better address) these industrial cybersecurity-related challenges.

Applying the Kübler-Ross grief model to cybersecurity
At first glance the Kübler-Ross grief model may appear to have little to do with how we manage the security of automation systems. However, there are parallels between it and acceptance of the growing threat of cybersecurity attacks or compromises of automation systems used in the critical infrastructure.

Stage 1: Denial
When asked about programs and levels of preparedness in the face of potential attacks or compromise, common responses heard include: “We are not a target.” “Why would anyone attack us?” or “We are not connected to the Internet.” The assumption that responsibility for cybersecurity rests exclusively with the IT department is also a form of denial.

Stage 2: Anger
When presented with these realities, it is common for managers to express anger or frustration. This is almost certain to happen in the wake of an actual attack or incident that negatively impacts critical systems. This is evident from the types of questions that responsible managers will pose to their staff. Examples include:

- Why didn’t you warn me about the risk of network connections?
- Can’t we meet the legitimate needs of the business in a secure manner?
- Why have we allowed sloppy practices such as the sharing of portable media to increase the risk to our systems?

Managers may ask questions like these even after previously refusing to heed warnings and provide the resources needed to improve the security of key systems before an incident occurs. This can in turn lead to frustration on the part of cybersecurity professionals whose advice was not taken.

While both responses are understandable, they do little or nothing to address the real problem or improve the situation. Rapid response is necessary not only to address the immediate risk, but also to protect systems in the face of evolving risk. Additional threats and vulnerabilities will emerge over time, possibly resulting in even more serious consequences.

Stage 3: Bargaining
Identifying, analysing, and selecting solutions to improve system security typically includes various types of bargaining. Internal and external discussion and dialog in this phase revolve around a fundamental assertion: “If we take certain steps now, will they increase our protection and mitigate consequences?” Of course, the difficulty is in determining exactly which steps or measures are ‘right’ or most appropriate for the situation.

This may be the most interesting and dangerous stage, as it requires steadfastness in the face of urgency. It is essential to reconcile input, opinions, and proposals from different stakeholders and advisors, each that will bring their own perceptions, biases and agendas. The most critical need at this stage is for a well-defined and proven process for identifying and evaluating proposed solutions. The key input to this process is a clear set of constraints, expectations, and requirements. Where possible, the latter should be based on or derived from established industry standards and practices.

Stage 4: Depression
Unfortunately, threats and vulnerabilities are constantly evolving, and new attacks are reported regularly. Each new report triggers an exercise to reassess protective tools and processes, leading to further frustration and fatigue. At this stage it is common to become resigned to the inevitability of an attack or some type of cyber-related incident. This inevitability makes it essential to have a plan for response in advance.
To offset the natural discouragement, it is important to remain aware of not only successful attacks or incidents, but also the successes that others have had in mitigating threats or even preventing incidents.

**Stage 5: Acceptance**
Recognising the fact that virtually all computerised systems are at risk creates an environment for proper cybersecurity management. However, simple acknowledgment is not enough. It is also essential that managers understand that managing cybersecurity risk is no different than that required for any other type of risk, such as personal safety or handling hazardous materials. Many companies already have processes and procedures in these areas, and managers need to accept the need for a sustained cybersecurity response.

**What this means for the asset owner**
Industrial asset owners face a daunting challenge in defending and protecting the integrity of their automation systems. One of the first and perhaps most important milestones in successfully meeting this challenge is to understand and accept what can and cannot be changed. Technical expertise is essential, but not sufficient. Experts must also have practical experience in industrial or operations environments to be most effective and avoid potential misapplication of specific solutions. They must be able to collaborate and work closely with their counterparts in other disciplines, such as automation and process safety.

Finally, members of the cybersecurity team must be able to effectively communicate with management and other non-technical personnel to help them understand the nature of the possible risks, the required response and the need for any changes in their behaviour.

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

---

**Solutions for production efficiency**

Live Monitoring is a local South African software house that develops MES as well as asset monitoring and energy efficiency systems to provide a competitive edge through cost effective live insight into production processes.

All manufacturing industries face increasingly difficult trading conditions due to a depressed economy; in South Africa this is compounded by rising input costs, especially electricity and labour. In order for them to remain globally competitive therefore, they need to ensure maximum output value from assets and equipment.

**ProduMax and PowaMon**

ProduMax and PowaMon have been successfully deployed on the shop floor in a number of manufacturing industries. This is especially the case in injection moulding, printing, carpeting and textiles, where clients have indicated they have improved production efficiency by more than 11% and managed to get ROI in a matter of months.

ProduMax is a tool that helps to improve manufacturing efficiencies, reduce downtime and visualise production data. While PowaMon is a live energy consumption data collector, billing, alert and reporting engine, which helps companies visualise their power consumption, set goals and be alerted of issues.

ProduMax enables manufacturers to monitor their production process in real-time. This enables the operators and management to view their efficiency visually and adjust or report on issues as they occur. The data is logged for historical analysis and reporting, which enables the bridging of manufacturing processes between the shop floor and the management processes, an often overlooked link in manufacturing. The ProduMax system also has an alert engine that warns users of events such as machine downtime or performance problems. This allows the timely correction and improves production output before it affects downstream processes.

PowaMon is a specialised module of the LiveMon asset monitoring platform, which collects data from a range of sensors and devices, and is easily extendable when required. PowaMon is also designed to collect data from smart meters installed onsite or remotely. Alerts can be set using the LiveMon core to be sent via SMS or email if data is out of thresholds i.e. low power factor correction etc.

PowaMon and ProduMax enable powerful web services, which allow further data integration and interrogation utilised to produce real data on power consumed per item produced. They allow the fine details to be examined to determine the impact of energy efficiency projects and identify wasted energy usage. Visualisation enables power draw to be monitored against the impact on time of use tariffs for the reduction of consumption during peak periods.

Recent enhancements to the platforms include the Mobile HMI for ProduMax, where users and managers can view and operate the ProduMax or LiveMon solution via a tablet or mobile device. Currently biometric integration is being added to allow for positive operations identification and tracking via data streamed into an analytical engine.

**Live Monitoring vision**

Even though the current LiveMon platform is already IP-based and can be hosted in a virtual environment, Live Monitoring has secured the first round of funding to develop a proof of concept solution that will see the ProduMax, GreenMon and LiveMon functionality built into an IIoT cloud-based solution coupled with dedicated modular sensors for a full end-to-end cloud hosted system that includes a platform for sharing knowledge and ideas.

For more information contact Roger Fraser, Live Monitoring, +27 82 465 9472, admin@livemonitoring.co.za, www.livemonitoring.co.za

---

www.instrumentation.co.za  October 2018  47
How adding services to products could start your journey towards an Industry 4.0 solution

Digital transformation, according to Microsoft, is about reimagining how you bring together people, data and processes to create value for your customers and maintain a competitive advantage in a digital-first world.

For manufacturers, digital transformation involves understanding a range of new technologies and applying these to both create new business and to improve the current operation. Industry 4.0 provides us with some clues as to how technologies such as robotics, artificial intelligence, cloud computing and the IIoT will come together in the near future to transform the manufacturing sector.

Successfully navigating this complex landscape will require striking a balance between putting in place resilient and stable IT platforms that will last into the future, while also executing small tactical technology-based projects that can yield immediate value and help gain experience.

The clock is ticking
When considering the complexity, it is not surprising that many manufacturers who intend to embark on a digital transformation journey are still at the starting point. Short term business pressures make it difficult to know exactly how to move forward. Many people are simply too busy surviving to worry about Industry 4.0.

But the clock is ticking. For example, it is estimated (according to the US National Manufacturing Institute) that 78 million employees will retire from manufacturing in the USA in the next ten years. By extrapolation this will be a worldwide trend. This loss of skill and expertise will have to be replaced, and the next generation of talent will be looking for companies that are well advanced in their digital transformation effort and who have more ambitious digital strategies, according to Forrester.

Implementing technology for the sake of technology itself is never a good business decision. Technology investments must always be aligned to ultimately create value for customers. Technology-enabled new business models must be found that generate additional revenue streams, protect competitive advantage and raise the barriers to entry for competitors.

Developing new capabilities in a manufacturing company
In manufacturing, it is likely that many of the fundamentals already exist and Industry 4.0 will simply continue to build on established concepts. One example is ‘servitisation’ which is the process of developing new capabilities in a manufacturing company that supplement traditional product offerings with value-added services. Many years ago, our company was implementing servitisation to grow our competitiveness in water treatment chemicals. Instead of simply offering the chemicals as stock items in containers and drums delivered to a warehouse, we offered a complete managed service to our customers.

Customers bought a ‘solution’ whereby their stock of treatment chemicals was monitored and replenished automatically by our system. This effectively provided them with an assurance that they would never have a problem with water treatment. We held stock of chemicals on their behalf and through a service-level agreement we ensured that they were always running. In today’s terms our technology was relatively antiquated, involving dial-up modems that could read stock levels on premise and automatically place an alert in our ERP system to replenish the stock.

With the IIoT and the cloud the old concept of servitisation is now given a new life. Cloud connected IoT devices can measure many different variables relating to the use of physical products by customers. A well understood example is the ability to measure machine vibration and allowing the vendor to automatically schedule preventative maintenance. The customer is buying more than a machine, they now buy a solution

“Servitisation is the process of developing new capabilities in a manufacturing company that supplement traditional product offerings with value-added services.”

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

For more information contact Gavin Halse, Absolute Perspectives, +27 83 274 7180, gavin@gavinhalse.com, www.absoluteperspectives.com
Omron Corporation and Cisco Systems have agreed to collaborate by integrating Cisco’s leading networking and security technology into Omron PLCs, designed to deliver reliability under extreme conditions at manufacturing plants. Through this collaboration, the two companies will enhance the security of today’s increasingly intelligent IIoT-enabled manufacturing sites by helping to ensure safe and secure production.

As the IIoT becomes increasingly widespread, the number of connected devices is expected to reach 50 billion by 2020. Moreover, manufacturers around the world are working to strengthen their global competitiveness and corporate value by improving their manufacturing capabilities. The industry is also rising to the challenge of making manufacturing sites intelligent through the active use of digital technologies. At the same time, manufacturing sites are facing more serious threats than ever before, as evidenced by reported cases of disrupted production due to ransomware and other malware attacks.

The concept of servitisation is not new, it came to prominence in the late 1980s. What has changed is that there are now many new digital technologies that make it a real possibility. The cloud for example makes connectivity to almost any place in the world a reality, something that back in the 1980s, when we were monitoring water treatment chemicals using dial-up modems, would have been prohibitively expensive. Mobile connected devices enable field service teams to move between sites and react to breakdowns. And so on.

I think that Microsoft’s succinct definition of digital transformation quoted at the beginning of this article is a very good summary of what is involved. Reimagining what is possible with new technology does not always mean reinventing the wheel, but rather building on established principles of business using the new technologies available. The need for manufacturers to be proactive in embracing Industry 4.0 is very important if they are to be successful into the future. For those manufacturers that are wondering where to start, perhaps take a look at some of your established products and imagine how they could be made more valuable to your customers by adding services that are now made possible by using some of the new technologies available.

Omron and Cisco work together to construct a secure environment where PLCs, as core automation components, provide security authentication for three discreet elements, namely people at manufacturing sites, devices connected to machinery and production lines, and data exchanged. By integrating Cisco’s globally proven network and security expertise with Omron’s controller technology, which brings together control and information, the companies will contribute to advances in manufacturing by enabling the safe and secure use of the IIoT at manufacturing sites.

Prior to forming this technological partnership, Omron developed the Machine Automation Controller NJ Series, the flagship PLC that comes standard with the OPC UA server and is compliant with the security enabled global communications standard. The new PLCs enable secure data communication with software and devices supporting OPC UA.

In addition, by combining Omron’s PLCs with Cisco’s network and security technology, the companies will expand the range of solutions available for the authentication of people and devices.

**For more information contact Omron Electronics, +27 11 579 2600, info.sa@eu.omron.com, www.industrial.omron.co.za**
Energy management software

By Carlos Ruiz and Tim Shire, KBC Advanced Technologies.

Energy management solutions from KBC, a subsidiary of Yokogawa Electric Corp.

Poorly designed and overly simplistic energy performance indicators (EnPIs) often drive energy savings at the expense of product yield or quality. However, a well-designed energy management information system (EMIS) can minimise energy cost without impacting production and, in some cases, can even enhance process performance.

Traditional energy monitoring applications mainly focus on improving energy-side key performance indicators for fired boilers and heater efficiencies, energy intensity, utilities’ marginal cost, etc. These monitoring applications rely on inputs from various process measurement instruments with temperature leading the way, to verify performance.

However, covering an expanded range of production parameters – including energy supply, demand and recovery, product quality and process yields – requires integration of the process with energy simulation, monitoring and optimisation tools. This article shows how to overcome traditional barriers to energy saving by using rigorous process simulations to monitor performance and determine optimum operating targets for improving both energy and process performance.

The energy opportunity

Energy is the largest controllable operating cost at most process plants. A typical refinery or petrochemical plant may spend $200–300 million/y on energy, so cutting just 3% in energy cost can save $6–$9 million/y. Such energy savings always result in direct bottom-line benefits, unlike adding capacity or changing product mix, which depend on anticipated market conditions.

Energy production and distribution systems often constrain processes. For example, a process compressor can be limited by its turbine drive’s capacity and efficiency, so steam and condenser operating conditions or degradation of the turbine can mean the drive reaches its limit before the compressor does. In another example, the amount of heat a process furnace is able to deliver can restrict unit throughput. Energy-related bottlenecks often curb throughput of high-margin processes by 2–3%.

One challenge is to understand the amount of potential energy improvement. Plants typically compare themselves against their peers. However, this comparison is only meaningful if the leaders are highly efficient.

An alternative approach is to compare energy use against a thermodynamically and economically achievable minimum. KBC Advanced Technologies, a wholly-owned subsidiary of Yokogawa Electric Corporation, has developed an energy metric called the Best Technology (BT) index. The target BT index is calculated based on an optimised process configuration including reactor conditions, number of distillation column trays, etc., as well as pinch analysis for heat recovery and R-curve analysis for utility delivery. This enables the specification of all equipment for maximum efficiency.

Pinch analysis is a methodology for reducing energy consumption of processes by calculating thermodynamically feasible energy targets. R-curve analysis determines the hypothetical ideal utility system and fuel utilisation for power and steam generation.

Repeating these optimisation calculations for a range of feedstocks, operating severities and product yields determines a relationship between optimum energy use and process performance. The optimum target energy benchmark is defined as 100.

The actual BT index is calculated as the ratio of actual energy use divided by the target, in %. For example, if the plant is using twice the energy of the benchmark, then its BT index is 200%. This index basically compares current energy use against that of the best available technology in the market.

EMIS issues

Most EMIS software packages focus only on the energy supply side (for example, the efficiency of production of steam and power for use in the process), so their EnPIs do not reflect the impact of feedstock effects or process yield. For instance, if energy consumption increases, they cannot indicate whether this stems from inefficiency, lower quality feedstock or the demands of higher quality products. These software packages may monitor equipment performance but often miss the chance to switch an item of equipment off when its output is not needed to support production.

EMIS software can become out of date and may get misused, and plant personnel may fail to exploit its full value. Consequently, sites do not always act upon advice and recommendations provided by the EMIS because it is not seen as irrelevant.

An EMIS frequently does not address the interaction of energy and production yield. Many plants integrate their energy systems with production processes, so changes in one area impact other areas.

Complicating the problem are changes in staffing, particularly the loss of veteran staff and the push to adopt leaner operations, making it more difficult for work processes and practices to catch up with technology.

Nevertheless, many companies still use a traditional EMIS approach. This produces energy cost savings but can miss some
opportunities by not considering the combined effects of energy use and process performance.

**An improved approach**

Adding process considerations can solve EMIS problems. For instance, simplified EnPIs drove the wrong behaviour in a fluidised catalytic cracker (FCC) at a refinery. In this FCC, an opportunity existed to lower cooling water temperature by resolving an issue on the cooling towers. This colder cooling water would improve condenser vacuum and increase the efficiency of a condensing turbine, providing benefits in one of two ways:

1. Reducing steam demand and saving energy.
2. Debottlenecking the compressor being driven by the condenser.

Conventional EMIS calculations for option 1 show a small savings of steam, amounting to $80,000/y, by improving the standard EnPI metrics of total energy use and specific energy consumption.

For Option 2, the EnPIs of total energy use and specific energy consumption increase, driven mainly by higher coke burn. However, when corrected for the improved process performance, the BT index decreases. Profitability is dramatically better, with more than $10 million/y increased value. The BT index is aligned with the yield drivers and, therefore, will not penalise profit optimisation.

In this example, a single simulation platform with an integrated process and energy model performed the optimisation to generate operating targets, considering both energy and yield. The resulting targets were embedded in the EMIS optimiser software.

**Update your EMIS**

Today, plants face a compelling need to reduce energy costs and improve yields without extensive and expensive equipment modifications, while ensuring energy enhancements do not adversely affect process performance, and ideally improve it.

Improvements needed in EMIS software to address these issues include:

- Process simulation to monitor performance and determine optimum operating targets by considering both energy and process performance.
- Updated EnPIs with well-defined targets to track energy performance in a consistent way while minimising feedstock and yield effects.
- Site-wide energy management and optimisation of utilities to deliver results and recommendations to the right people at the right time.
- Cloud-based support from the EMIS vendor to provide performance management and expert troubleshooting to resolve complex issues in real time.

Initial results of such an integrated approach show benefits can be substantial, ensuring Yokogawa and KBC are ideal partners for energy management solutions and services. Achieving 3-10% cuts in energy consumption or carbon emissions is often possible without capital investment in new equipment. Where energy systems are constraining process performance, sites have realised 1-3% increases in throughput or yield, with the synergy between process and energy optimisation leading to benefits far greater than considering either in isolation.

**For more information contact Christie Cronje, Yokogawa South Africa, +27 11 831 6300, christie.cronje@za.yokogawa.com, www.yokogawa.com/za**
Data fuels the progress of our digital world in many ways: personal devices, medical systems and online commerce, for example. But public works systems, factories and transportation can also benefit from the collection and application of data. This realisation has driven heavy investment in the Internet of Things (IoT) across all major industrial markets. Everyone is seeking value in their IoT application. However, without a well-defined analytics strategy, it is hard to make sense of the data collected.

Device data has value when it can be collected, analysed, interpreted and then used to derive insights to drive improvements in productivity. These productivity gains scale in value according to the level of insight and automation of the system in question. Solutions can be as simple as remote diagnostics and as advanced as self-optimising control systems. The journey to move from diagnostics up through automation starts with understanding the problems that need to be solved.

In industrial IoT (IIoT), the primary objective is often to monitor and optimise equipment health and productivity. This requires machine-level insights, so that machines can self-report the difference between optimum and actual performance. But machines themselves tend to be systems of systems, each crafted from components. Often, generating insights at a machine or system level requires deep visibility at the component level. These components need to be represented digitally as models for expected behaviour, and by combining these digital representations, customers can understand when their systems are exhibiting suboptimal performance.

Parker’s Voice of the Machine platform contextualises the data collected from machines.

**Parker’s Voice of the Machine**

These component and subsystem-level insights are where Parker Hannifin shines. In fact, Parker’s century of experience in motion and control technologies and its understanding of systems and components are the foundation of the company. Parker’s focus in IIoT – through its platform called Voice of the Machine – is on component and subsystem-level insights referred to as Discrete IoT. Discrete IoT is a component-centric approach, where distinct component insights form the foundation for higher-level system, machine and even fleet level productivity gains.

Parker’s approach to deriving value from the IoT centres on contextualising the data collected from machines. Models of both the overall system and of the individual components are constructed and then
leveraged to produce insights. It is a mirrored reality where digital twins of components are connected to build digital twins of systems, much like the way their physical counterparts are assembled. Once insights are identified, opportunities emerge for customers to create actionable improvements (e.g. adjustments, fine-tuning and modifications) within their existing processes and systems. Supported with the model-validated insights, Parker's customers who leverage Voice of the Machine solutions are better equipped for decision-making, planning and management of their operations.

**How Discrete IoT empowers decision making**

The real value of the IoT comes from the ability to derive useful information from machine data. To enable that type of decision making, machine and component knowledge must be combined with top-level operational goals.

Understanding of the current state of an asset, along with the repercussions of possible actions, allows the costs and benefits of decisions to be evaluated before they are made, helping to determine the best strategy to drive towards the company's goals.

Consider the task of scheduling maintenance for a factory machine. Decisions about stopping machines, interrupting operations and performing maintenance often depend on many factors: What is the production schedule? Is there planned downtime coming up? How much will it cost to replace? What is the loss of performance cost compared to the cost of replacement? How long will the machine be down? If a worn component does not get changed, how will that affect performance or safety? Understanding the answers to these questions is central to making better decisions. But, just as important, is collecting and analysing the right data in a way that delivers actionable insights about the machine itself.

For instance, deciding what to do with a clogged filter requires an understanding of the possible scenarios that might play out if the filter continues to clog and decreases flow in the machine. Those scenarios include not only what happens to the filter but also the impact on the machine's operation, such as diminished product quality. These types of questions can be addressed through machine and component models.

In this situation, component modelling effectively tracks filter blockage over time, letting the machine operator know how blockage increases pressure and reduces filtration efficiency. However, determining when the filter reaches the point where it must be cleaned or replaced involves big-picture information about the operational trade-offs between downtime and performance. This knowledge allows the machine owner to optimise machine health and output, improve service scheduling, calculate costs for downtime and minimise negative impacts like clogged filters. The start of all of this analysis originates with the knowledge of a single component – the filter.

**How digital twins deliver insights**

In many cases, data enables optimisation of Parker’s products in customer applications. The ability to maintain online virtual models (digital twins) of physical assets is key to the process. Sensor data from the actual device is sent to the cloud, where the digital twin algorithm maintains parity with the asset's current state. It is the actionable insights discovered through these digital twins that guide IIoT analytics at Parker.

The most immediate use of a digital twin is to compare the ideal or expected state with the current state of the machine. If the component is working as intended, these two should align. Any discrepancy can provide insight about what is broken on the machine and the amount of service life remaining in consumable elements inside the machine. Digital twins form the foundation of advanced condition monitoring.

For example, Parker’s IQAN Connect product helps OEMs remotely connect to the electronic control systems in heavy-duty mobile machinery, enabling them to collect diagnostic information as if they were in the field, hooked up to a test set. Comparing actual and expected component performance enables weekly reports on overall fleet health and alerts operators to any recommended action.

Another way digital twins enable insights is by allowing customers to infer physical values that are not directly or easily measured, helping to reduce measurement costs and decreasing the number of data points needed. Additionally, quantities that are not measurable, such as fatigue state or wear level can be effectively estimated. This helps move from a ‘measure everything’ mindset to measuring as little as needed and computing the rest.

Finally, digital twins help by allowing customers to explore future outcomes for a range of possible scenarios. For example, questions such as: “When will this filter clog enough to affect quality of output?” and “What would happen if I did nothing?” can be answered. Knowing how each scenario will play out provides actionable information. Exploring how different decisions impact the future, and then choosing the best course of action, yields performance optimisation. Digital twins enable predictive scenarios where operators, or even the machines themselves, can choose the actions that lead to the best possible outcomes.

As an example, it is possible to detect leakage on a hydraulic cylinder. But if that cylinder is part of an excavator on a job site, users will want to relate that cylinder's hydraulic fluid loss to declines in excavator productivity. They will also need an operational model for how the equipment is expected to perform and be maintained. With both of those models in hand, the rising cost of reduced productivity can be weighed against downtime for maintenance, allowing the service to be scheduled at the optimal time. Increasingly, digital twins will enable critical decision making at the enterprise level.

The use cases for digital twins in analytics continue to evolve. The latest trends include using real-time machine-learning models to adjust the definition of optimal performance to account for localised operational conditions and using artificial intelligence to predict the most likely failure modes.

Parker is dedicated to delivering actionable insights on the many discrete components and subsystems it sells to customers. As such, it is devoting significant resources to modelling its connected products to enable simpler analytics through product-level insights, which can then aggregate to system, machine and fleet-level solutions. All of this is powered by Parker’s Voice of the Machine platform.

*For more information contact Lisa de Beer, Parker Hannifin SA, +27 11 961 0700, lisa.debeer@parker.com, www.parker.com/za*
Key considerations when designing IIoT networks for smart businesses

In the era of the IIoT, industries have opportunities to become more productive, more efficient and more dynamic. For example, the IIoT provides businesses with new capabilities such as dashboards that show device status and data in real-time, as well as the on-demand production of customised products. However, many applications still have to overcome several networking challenges before they can really reap the benefits. A successful IIoT strategy is driven by a number of key factors related to connectivity. This article takes an in-depth look at three of these key points.

1. Interoperability with existing and new machines
Within the automation industry, companies typically purchase equipment that they will use for decades. When new trends evolve, such as the IIoT, business owners do not want to replace their existing equipment, but rather want solutions that allow them to incorporate their unconnected legacy devices into modern solutions. Broadly speaking, two options are available to them:

   - **Protocol gateways for multi-language connectivity**
     Industrial protocol gateways convert and connect legacy equipment with one unified communication protocol before transporting data to IT systems, for example, converting different proprietary industrial protocols used by legacy devices into one more common protocol, such as Modbus/TCP, Ethernet/IP or Profinet. This simplifies OT engineers’ efforts when they need to extract data from multiple sensors and machines that use different communication protocols.

   - **OPC UA to future-proof a network design**
     When it comes to newly purchased devices, supporting OPC Unified Architecture (UA) protocols is essential. OPC UA is platform independent and ensures a seamless flow of information among devices from multiple vendors. Originally, OPC UA worked on a client-server model, but when dealing with hundreds or thousands of devices that all need to be interconnected across multiple sites, a more scalable solution was needed. This led to the adoption of the publisher-subscriber model (PubSub), which allows for more streamlined communication that offers improved scalability and resilience. Furthermore, PubSub also extends the OPC UA protocol to cloud-based communication in the automation industry.

2. Facilitating communication between the OT and IT with IIoT gateways
Close cooperation between IT and OT professionals is fundamental to leverage any smart application’s IIoT platform. To be successful, both domains need access to industrial data. IT departments, which oversee enterprise resource planning (ERP) and sometimes MES, need to review this data to form the bigger picture and then develop solutions for each of the issues that hamper an operation’s reliability. OT professionals are more closely involved with the physical operations on the factory floor and have to figure out how to make all the divergent systems, fitted mostly with proprietary technologies, work together. Business owners must find a suitable solution to allow these two groups of people and two different sets of protocols to work together.

   - **IIoT gateways are frequently used to bring the OT and IT worlds together. They will continue to play an important role in IIoT networks in the foreseeable future because these networks do not currently use a set of universal protocols. Direct transmission of vast amounts of data across these networks can lead to network latency, and IT personnel have to put in a lot of extra effort to identify useful data, resulting in delayed data analytics. To deal with this, there are some features that gateways should support to make the process more effective.**

In the next article, we will delve into the third key consideration for successful IIoT networks for smart businesses.
IT IN MANUFACTURING

Omniflex specialises in remote monitoring solutions based on years of plant networking experience from last mile networking to mainstream Ethernet backbones. The Teleterm range specifically addresses the remote outstation issue by providing a programmable platform based on IEC61131 languages for control and networking options from low grade cable to radio and GSM infrastructure. Wireless distributed PLCs with inherent data acquisition capability are an attractive proposition against cable-based systems.

HMI systems can link easily with SQL databases, Use MQTT and OPC UA to integrate into larger MES system with links to big data. Visualisation can also be wireless, through the use of Wi-Fi a tablet for a portable operator interface or management tool can be used for linking into the system without having to use fixed desktop computers. Remote site visualisation is achieved the same way using a tablet and remote Teleterm devices via the Internet and local integrated routers. Other features include:

- Flexible configurable I/O analog and digital.
- Ethernet and wireless ports.
- Programmable serial port.

IIoT enabled control and data acquisition from Omniflex

Smart processing capabilities: as gateways are deployed across many different applications, each gateway should have specific rules so that only the information useful to that application is passed to the cloud where the data will be analysed. As the data is filtered before it is transmitted to IT applications, the transmission times are shortened and the operators only have the relevant data, which allows them to perform more accurate data analysis.

Secure remote communication: in order to prevent data stored on the gateway from being tampered with, it should be secured with a file protection system such as Trust Platform Modules (TPM). For remote connections, a VPN should be used to connect the control centre and the gateway.

3. Ensuring network security from LAN-centric to LAN/WAN convergence

With multiple devices connected on the same network, all entry points can be vulnerable to unauthorised access if proper security measures are not taken. This problem is exacerbated by the fact that many industrial protocols were not designed with cybersecurity in mind. As devices now frequently connect to the Internet, they can be open to remote access over that network because legacy protocols rarely support encryption or user authentication. The problem business owners need to overcome is how to ensure that their networks are protected now and into the future as networks continue to evolve.

Many system operators have stated that the best way to secure a network against cyberattacks is to use the defence-in-depth security architecture, which is designed to protect individual zones and cells. Any communication that needs to take place across these zones or cells must be done through a firewall or VPN. Deploying this type of architecture reduces the chance that the whole network will fail due to an attack, because each layer is able to address a different security threat. It also reduces the risk to the entire network. If a problem occurs in one part of the network, there is a higher chance that the problem can be contained within that layer and will not spread to the other layers.

After the network has been secured, the next step to consider is how to ensure that users cannot adversely change settings by accident, or on purpose. This problem can arise from users who operate and manage the network, third-party system integrators, and contractors that are required to perform maintenance on the network. The best way to secure against this threat is to enhance the network devices’ cybersecurity to ensure that they cannot have their settings altered in a way that puts the devices or the network at risk. Many cybersecurity experts view the IEC 62443 standard as the most relevant publication for how to secure devices on industrial networks. This standard includes a series of guidelines, reports, and other relevant documentation that define procedures for implementing electronically secure IACS (industrial automation & control systems) networks.

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

Omniflex specialists in remote monitoring solutions based on years of plant networking experience from last mile networking to mainstream Ethernet backbones. The Teleterm range specifically addresses the remote outstation issue by providing a programmable platform based on IEC61131 languages for control and networking options from low grade cable to radio and GSM infrastructure. Wireless distributed PLCs with inherent data acquisition capability are an attractive proposition against cable-based systems.

HMI systems can link easily with SQL databases, Use MQTT and OPC UA to integrate into larger MES system with links to big data. Visualisation can also be wireless, through the use of Wi-Fi a tablet for a portable operator interface or management tool can be used for linking into the system without having to use fixed desktop computers. Remote site visualisation is achieved the same way using a tablet and remote Teleterm devices via the Internet and local integrated routers. Other features include:

- Flexible configurable I/O analog and digital.
- Ethernet and wireless ports.
- Programmable serial port.

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

www.instrumentation.co.za October 2018 55
The ability to collect and manipulate vast amounts of digital information will catapult manufacturing into the future. By embracing digitalisation, SKF aims to enhance its core offering – bearings technology, and related services – so that customers can further boost the performance of their rotating equipment. Furthermore, by focusing on industrial digitalisation, SKF plans to drive the optimisation of cost and efficiency of the full value chain, including world class manufacturing and supply chain integration.

Growing expertise
Digitalisation will affect all parts of the value chain, from design and manufacturing through to purchasing and maintenance.

SKF has been monitoring equipment remotely for around fifteen years and currently has around 1 million bearings connected to the Cloud. Data from them is gathered and interpreted daily by experts. The ability to handle this data leads to enhanced analytics, allowing the early detection of potential failures in rotating equipment, and to get a better understanding of critical product and system design requirements.

There are various platforms available to help customers gather and interpret data. For instance, the Enlight platform helps operators visualise data from a variety of sources, using a device such as a smartphone or tablet – an easy way to put Big Data into an operator’s pocket. The connectivity of the data runs in all directions, and can be used in many ways. At its simplest, it connects a sensor to a remote diagnostics centre. However, the data – on the health of a bearing, for instance – can be fed right back to the design stage, and used to help redesign a better product.

Increased digitalisation has also begun to allow more customised manufacturing. Because it can cut machine resetting times close to zero, there are fewer restrictions to making customised products. Recently, the owner of an aluminium mill required bearings that would allow increased output – through a higher rolling speed – as well as lower maintenance costs and the elimination of unplanned downtime. SKF was able to produce four-row cylindrical roller bearings complete with optimised surface properties and customised coatings to boost service life and robustness, as well as designing out product cost.

Paid for performance
A major shift in the future, aided by digitalisation, will be the way in which customers are served. While the usual ‘transactional’ model of providing hardware will remain important, it will start to be replaced by more performance-based contracts.

Here, SKF will be responsible for ensuring that the customer’s operations remain efficient. Supplying hardware like bearings will then be supported by services – from predictive maintenance to lubrication expertise – that deliver this extra efficiency.

Recently, the company agreed a five-year ‘Rotation For Life’ contract with Zinkgruvan Mining of Sweden. SKF will carry out remote monitoring of four mills at a Zinkgruvan enrichment plant for a fee based on whether productivity targets are met.

This arrangement relies on digitalisation technologies working in synchronisation. In one element of the contract, monitoring data from a conveyor belt is gathered automatically and a specialist analyses the deviations if necessary, while a distributed lubrication system keeps the line running at optimum efficiency.

Paving the way to a digital future
The ability to correlate a wider variety of data can further improve performance. For instance, condition monitoring data can be combined with process data to make more informed decisions on maintenance and asset performance. For example, analysing both monitoring and process data might reveal that slowing a machine down by 3% would extend the maintenance period by four weeks. The customer can then balance a slight reduction in output with a longer production period – and make the best possible decision.

Self-replacement
Automatic detection of a failing bearing is a massive step forward in efficiency. However, the process of ordering the replacement still involves human intervention, which is why SKF is already gearing up for a future in which the faulty part effectively puts in an order for its own replacement.

This extends the 'just in time' manufacturing concept down as far as the individual component and could one day bring stock levels close to zero. This type of system is still under development. However, SKF is running pilots in specific areas of the supply chain. In the future, the plan is to join these together, allowing full, end-to-end digitalisation.

For more information contact Samantha Joubert, SKF South Africa, +27 11 821 3500, samantha.joubert@skf.com, www.skf.com

In response to industry demand for increased quality in food and beverages at every level, Emerson has introduced the Rosemount CT4215 food and beverage leak detection system. The CT4215 is a quantum cascade laser/tunable diode laser (QCL/TDL) continuous, inline detection system designed to help assure quality and safety, maximise production volume and decrease product waste for food and beverage products. It tests the seal and integrity of every bottle or package on a production line, detecting leaks at a sensitivity as low as 0,3 mm and automatically rejecting any defective bottle or package without slowing down production. This is in contrast to the traditional practice of testing occasional grab samples, which can leave a manufacturer vulnerable to low quality, unsafe food or beverages, reduced profitability and damaged reputation.

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

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

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

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

For more information contact Rob Smith, Emerson Automation Solutions, +27 11 451 3700, rob.smith@emerson.com, www.emerson.com
New infrared sensor for online thickness gauges

Yokogawa has announced the WGS1S2 infrared sensor for the Webfrex NV online thickness gauge to measure and control the thickness of films and sheets with greater accuracy than before.

Thickness gauges are used on film and sheet production lines to measure and control film and sheet thickness. Various kinds of plastic film have been developed for packaging, including highly functional film that can preserve the quality of packaged contents and film that can be printed with vivid colours to improve the attractiveness.

With its unique optical system consisting of a frequency-modulated light source and dual-integrating spheres, and its digital lock-in amplifier circuit for weak-signal detection, the WGS1S2 offers significantly improved accuracy and measurement stability. It is suitable for use with thin films (10 to 300 μm). With 20 μm thick polypropylene film, the sensor achieves its maximum accuracy of 0,1 μm. It can be used for a variety of applications including transparent, opaque, and foamed films. As the WGS1S2 has been optimised for reliable on-line measurement, it is much less affected by film pass-line fluctuation or disturbance infrared light, and precise measurement is assured even with fast moving film.

Conventional sensors are equipped with a motor for rotating the filter and the motor needs to be replaced periodically. The WGS1S2 uses a frequency-modulated light source with no consumable mechanical parts. The light source is the only part that needs to be replaced, and it is designed for easy replacement requiring no adjustment. With already installed Webfrex NV systems, upgrades to the new WGS1S2 sensor can be done without having to change the frame that houses the sensor.

For more information contact Christie Cronje, Yokogawa South Africa, +27 11 831 6300, christie.cronje.za.yokogawa.com, www.yokogawa.com/za

Effective UPS monitoring

For more than three decades, the cornerstone of network reliability and availability – the uninterruptible power supply (UPS) – has ensured the protection of hardware, software and data for small, medium and large networks all around the globe.

While UPSs themselves are designed to be durable and dependable, maximising their potential requires that they are properly looked after. And, while most are aware that, even with care, parts such as batteries will eventually need replacement, many overlook the importance of the monitoring and regular maintenance of this vital piece of equipment.

Even with the inclusion of the self-monitoring software and auto-notification features incorporated into many of the latest models, regular inspections ensure that UPS systems are operating properly.

“The recent innovation of a cloud-enabled UPS, designed to protect smaller, distributed IT devices and networks has, however, provided a major step forward in the ease and convenience of maintaining UPSs,” says Riaan de Leeuw, vice president, Schneider Electric ITD Anglophone Africa.

The APC by Schneider Electric Smart-UPS with SmartConnect combines ease of installation and use, together with monitoring and automated actionable alerts to propel a new generation of partner service provision.

“Monitoring is also a perfect platform for Managed Service Providers (MSPs) to deliver value to their customers because more than ever, almost every business is dependent on the availability of IT services for their daily operations,” adds de Leeuw.

MSPs can install up to 25 APC SmartConnect compatible UPSs at any customer site and integration with APC SmartConnect eliminates the need for costly training, ensuring an easy workflow integration by removing the necessity to code or even install SNMP traps.

Cloud-enabled UPSs also allow MSPs to view the UPS status through the secure portal, as well as schedule firmware updates. Partners can use the information received from the cloud monitoring service to provide additional services to customers, schedule regular inspections and deliver proactive, timely maintenance that will avoid unnecessary downtime.

“Included in the benefits of cloud-enabled UPSs is peace of mind, where clients know their UPS system is being monitored and as a result, properly and proactively maintained for reliable performance in the event of an unplanned power outage,” concludes de Leeuw. “No matter where IT services are located, customers can remain focused on their core competencies and business as usual, safe in the knowledge that this crucial part of their infrastructure is safely being managed.”

For more information contact Prisca Mashanda, Schneider Electric SA, +27 11 254 6400, prisca.mashanda@schneider-electric.com, www.schneider-electric.co.za
Plug-and-play IIoT development kit

RS Components has launched an IIoT development kit for the Harting modular industry computing architecture (MICA) edge computer. The kit is a simple plug-and-play system that enables fast digital condition monitoring of multiple sensor inputs from machinery. IP54 protection makes it suitable for long-term use in factory automation environments as well as for prototyping and evaluation.

Condition monitoring using physical measurements such as temperature and vibration is an efficient way to improve the operation of machinery and plants. Changes in machine behaviour can be identified quickly and appropriate action taken. However, it can be expensive to integrate suitable monitoring equipment into existing industrial systems.

The IIoT kit integrates a Bosch CISS multiple sensor unit with a MICA edge computer. Firing up the software requires only a few simple steps, so sensor data is acquired almost immediately.

The compact, IP54-rated CISS sensor unit can be attached to any surface and can measure up to eight physical parameters: temperature, humidity, vibration, change of position, pressure, light, magnetic field and acoustics. The robust, IP67-rated MICA computer can be installed right next to machinery, without the need for a control cabinet. MICA connects to the sensor unit and local network via industry standard connectors.

Sensor data is displayed in MQTT format via the integrated browser-based NodeRed dashboard. Data can be analysed and stored in any IT system or IoT platform. A Microsoft Azure Cloud gateway is preinstalled and configured using NodeRed.

RS offers several ways to power the MICA CISS IIoT kit, depending on the operating environment. Engineers with access to a benchtop power supply should purchase a simple M8 A-coded power lead; wiring guidelines are included with the development kit. Engineers without benchtop power will need a Power-over-Ethernet (PoE) plugtop power supply and an RJ45 Ethernet cable.

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

SKF and Siemens to improve railway reliability

SKF and Siemens have signed a partnership agreement that will focus on improving train operators’ asset management efficiencies. The partnership will see the implementation of SKF’s Insight Rail condition based maintenance solution in combination with Siemens’ Railigent Application Suite that is linked with the IoT operating system MindSphere.

This new cooperation between SKF and Siemens, which leverages the resources of SKF’s digitalisation initiative, will facilitate online monitoring of several important components such as wheelset bearings and wheels via Siemens’ Railigent Application Suite for mass transit and infrastructure operators. The goal of this project is to help customers anticipate issues with individual components, and allow them to schedule maintenance only when it is required using one single monitoring system.

SKF Insight Rail is a fully wireless, condition based monitoring system for railway rolling stock operators. Easy to install and operate, the solution provides local measurement, data analysis and display of actionable information via an intuitive app. Railigent is a Siemens cloud-based Application Suite that provides a single interface for data collected from many different infrastructure and vehicle system components. Dubbed the ‘Internet of Trains’, Railigent gives operators the tools required to increase train availability by leveraging the power of the Industrial Internet Of Things.

Filip Rosengren, director, Railway Industry at SKF comments: “With Railigent, Siemens offers a powerful platform for a multitude of digital services. In particular, the system simplifies data access, enabling operators to gather essential data about the condition of their rolling stock components from a single access point.”

Johannes Emmelheinz, CEO of Customer Services at Siemens Mobility Division, adds: “Wheelset bearings are critical components for any rolling stock operator. Together with SKF we seek to move the industry toward the objective of one hundred-percent availability with safe, efficient service. SKF is a world leader in the bearings business and we are delighted to be able to offer its innovative Insight Rail solution to customers via our Railigent Application Suite.”

This new partnership between the two companies was signed in March 2018.

For more information contact Samantha Joubert, SKF South Africa, +27 11 821 3500, samantha.joubert@skf.com, www.skf.com
ELECTRICAL POWER & EFFICIENCY

Extensive electric motor range from Zest

Electric motor applications require a reliable, robust fit-for-purpose product that gives the end user the requisite low total cost of ownership. Fanie Steyn, manager for rotating machines at Zest WEG Group, says it is encouraging that most industries in southern Africa have woken up to the fact that purchasing the standard efficiency motor is not always the best long-term option.

As a leading supplier of electric motors in southern Africa, the Zest WEG Group offers a comprehensive range. In previous years, all WEG low voltage electric motors were manufactured at WEG Brazil, but today this major group’s manufacturing network extends to four continents. All facilities adhere to stringent quality control processes, are ISO 9001:2015 accredited and motors meet all the requisite international standards and regulations.

“The depth of the WEG low voltage range of electric motors allows us to offer customers the best fit for individual applications, and we are also able to draw from a line-up of motors that are engineered for specific application requirements,” says Steyn.

The WEG range starts from 0,18 kW motors that would be used to drive small fans or used in exhaust applications and goes up to 1250 kW motors used to drive large pumps or ventilation fans. Electric motors for specialised applications would include slip ring motors, roller table motors, saw arbor motors, gas pump motors, pad mounted motors, smoke extraction motors, permanent magnet motors, cooling tower motors and wash down motors for hygienic applications.

“Another significant trend reaping benefits for customers is the move towards using premium efficiency electric motors, also known as IE3,” explains Steyn. “While WEG electric motors are still available in standard efficiency, known as IE1, there is a remarkable increase in customers requesting IE3 motors because of the obvious energy savings that can be achieved.”

Zest WEG Group operates an extensive distribution network ensuring easy access for customers across the sub-Saharan region. Steyn says customer demand is carefully monitored and stockholding is maintained accordingly to ensure the highest possible service levels at the group’s nine strategically located regional branches.

For more information contact
Zest WEG Group, +27 11 723 6000,
info@zestweg.com,
www.zestweg.com

---

**HVAC Drive LSLV H100**

3-Phase 400V (0.75~500kW)
Built-in EMC Filter and DC Reactor *
Built-in Modbus-RTU and BACnet MS/TP
Capacitor and Fan life estimator
Multi Motor Control, Duty/Standby Control
Soft Fill, Dry-run Protection, Fire Mode

[elronics www.elronics.co.za](http://www.elronics.co.za)
The motorised size changeover of machine spindles or machine axes is now being implemented in various ways. The solutions to this are often relatively rudimentary with no hand-wheel or crank being rotated, but one or more buttons are pressed instead. While this does not meet the requirements of an Industry 4.0 process chain, intelligent positioning drives can offer an efficient solution in such cases.

Intelligent networks such as industrial Ethernet provide a high degree of diagnostic capability for fault analysis, in addition to the efficient and fast exchange of process data. For a smart size changeover, actuating drives are therefore necessary. In addition to the purely motorised changeover, these drives permit a complex data exchange with control systems, reliably detect operating states outside the fixed range, and communicate status or error messages, for example. As a result, a constantly increasing load current could signal that the adjustment axis may be heavily contaminated by pollutants and has to be cleaned during the next maintenance service. This is precisely where the intelligent actuators from Siko add their value. In addition to the pure exchange of process data, these actuators also make all diagnostic values available in order to be able to prevent unplanned downtime from erroneous format setting.

The all-in-one drive
With the new AG24, Siko has now expanded its portfolio of positioning drives with intelligent RTE (real-time Ethernet). In addition to the tried and tested positioning drives AG25 and AG26, which are characterised by their ultra-compact design, the AG24 has been released to expand the portfolio of actuators. Despite the considerable output power and speed of the AG24, all the components are still integrated in a single housing. No external components or junction boxes are needed to connect to higher-level controllers. This means that the drive is connected only to the supply voltage and the port for data exchange has to be connected directly to the controller or the next drive in the network. A simpler network connection is hard to imagine.

Power pack in all situations
With a maximum rated torque of 14 Nm, the AG24 is a real power pack. The compact drive reaches its maximum changeover speed of 150 rpm at a nominal torque of 6 Nm and can fully automate virtually any manual adjustment effortlessly. Due to the hollow shaft with clamping ring and torque support, the drive is very simply adapted to the existing machine shaft without the basic construction of the adjustment unit having to be changed. Other shaft diameters or the force transmission via a feather key groove is available as an option. The robust metal housing is designed with a protection class of up to IP65.

With the integrated 2-line LCD and the keypad, not only can individual IP addresses be assigned, but the current actual value and the respective setpoint can also be directly monitored for diagnostics. Furthermore, via the display and the keyboard, it is possible to check each stored parameter and to adjust it if necessary. Possible operating data can be read out and errors can be diagnosed without an analysis via the fieldbus being necessary.

With the integrated position controller, the setpoints are approached accurately with up to 1024 steps per revolution. With an optional integrated electromechanical brake, the position is also held securely in the case of external mechanical loads. Even without a brake, though, users never lose control of the positions. The integrated absolute value sensor also detects motions in the no-current state, which is why the actual position of the drive can be read back at any time when the system is switched on again.

For more information contact Instrotech,
+27 10 595 1831, sales@instrotech.co.za, www.instrotech.co.za
Quint Power DIN-mount power supplies from RS Components

RS Components now stocks the latest Phoenix Contact Quint Power DIN-rail power supplies, giving easy access to the innovative features and flexibility of these space-saving PSUs.

The fourth generation of Quint Power covers ratings up to 100 W, with 24 V output voltage and 1.3 A, 2.5 A, and 3.8 A nominal current ratings. They are the first members of the Quint Power family below 100 W to feature Phoenix Contact’s dynamic boost technology, which can supply up to 200% of nominal maximum current for up to five seconds to start loads that place high short-term initial demand.

In addition, the 1.3 A and 2.5 A models also support static boost that allows 25% over-current at any time for five seconds, to handle short-term peaks.

Further value-added features include preventive function monitoring, which warns of critical operating states before errors occur, and configurable signalling of DC OK or selectable power thresholds that let users adapt output-parameter monitoring to suit the application. The wide AC input range of 85-264 V, and DC range of 8-350 V, gives flexibility to power the units from various sources, such as the main AC line in any geographical market, or a DC bus, battery bank or industrial power supply.

The supplies have an ambient operating-temperature range of -25 to 70°C, allowing use in a wide variety of environments. Their slim and flat 90 mm-high design saves space inside enclosures, while efficiency of over 93% prevents excessive heat and helps cut energy consumption.

Socomec’s Digiware system deployed in Sandton

ElectroMechanica (EM) has supplied the Socomec Digiware system to a large South African corporation’s head office in Sandton, where it is being used for electrical metering in compliance of a Green Star rating.

EM is the sole distributor of Socomec’s metering offering and was contracted as a hardware supplier in this regard. Product manager Artur Socha explains that the system can cover a large number of metering points, is highly accurate, and also allows for significant space-saving in the electrical panels. The solution needed to be flexible and modular, and ultimately be able to translate data back to the building’s power metering and building automation system software.

The total number of metered points exceeds 1500, from LV main distribution down to sub distribution board level. The metering of all power distribution units in the data centre was also included in the scope, thus adding to the overall requirement of providing metering hardware with a small installation footprint within the panels.

The Digiware system comprises technological innovations that revolutionise metering, bringing a high degree of flexibility to installations and making connection and configuration easy. These innovations combine to deliver performance in terms of accuracy and functionality. This makes it an effective solution for metering consumption, and measuring and monitoring the quality of electrical energy in industrial or commercial applications requiring a large concentration of points with a small footprint. “These were the main reasons that the system was selected for this mega-project,” comments Socha.

The 12 000 square metre building is located in the heart of Sandton and in 2017, it received a five-star Green Star rating from the Green Building Council of South Africa, making it one of the largest new-build projects to receive this rating to date.

For more information contact Karen Zotter, ElectroMechanica, +27 11 249 5000, karenz@em.co.za, www.em.co.za

For more information contact RS Components SA, +27 11 691 9300, sales.za@rs-components.com, www.rsonline.co.za
Protecting data centres from lightning and surges

Data centres rely on the optimal performance of equipment, so unwanted surges on the power supply lines can cripple operations. In fact, these energy spikes can cost significant amounts of money in recovery time and hardware damage. Across the continent, DEHN Africa’s expertise provides surge protection for data centres against various potential causes.

Julienne Puttkammer, one of the technical team at DEHN Africa, says, “There are two main types of risk when it comes to data centres and electrical power surges. “These lightning strikes, both direct and indirect; and switching surges, which can be internal, potentially caused by the switching of a cooling system’s inductive load or possibly generator switch-over, or external, coming from the utility itself.

“In Africa, the foremost causes of surges to data centre systems largely depend on the area. For example, in regions with a stable supply, power surges are most commonly caused by lightning strikes, while in areas of unstable supply, the most frequent cause is on/off switching. Even a nearby lightning strike, and not necessarily a direct hit, can cause a surge to flow on conductors and electrical lines. So, the factors to look at are whether the facility is in a lightning-prone area, and the stability of the grid.”

He adds that because the consequences of a direct lightning strike can be catastrophic, it is common for data centre designers to opt for lightning protection installation, regardless of whether normal risk procedure requires it: “Data centres contain sensitive equipment, for which all kinds of backup power must be implemented to eliminate downtime.”

The main challenge in implementing surge protection measures involves coordinating all the aspects from the beginning of the project. “Ideally, the most comprehensive solution would include all the interlinking systems of lightning and surge protection from the design stage,” elaborates Puttkammer. “We need to think about issues such as cable routing or embedding bonding conductors in concrete. This needs to be well coordinated through the planning and construction phases.

“To come in once a rollout has been completed, or is already underway, means that you need to find the space to install and implement surge protection systems, which then requires some sort of compromise in many cases. And while it is not impossible to have a good system afterwards, retrofitting is not ideal. At DEHN Africa we are, however, seeing an encouraging move towards including lightning and surge protection for data centres from the beginning of a project.”

With regards to DEHN’s products and solutions for data centre surge protection, Puttkammer reiterates that it all starts with a planning phase: “We offer all the services required. A risk assessment, soil testing if necessary, a detailed design, an earth electrode design for AC system faults, and an inspection and sign-off on a lightning safety report. Thereafter we offer all the necessary tested products as well, including the lightning protection, earthing and bonding components, as well as the electrical and electronic surge protection devices.”

Data centres in Africa face some unique challenges in terms of surge protection. “We see some of the highest lightning flash density in central Africa, and some of the data centres we’ve worked on are very close to these high density areas,” concluded Puttkammer. “DEHN is seen as a lightning specialist and so we start with the lightning protection side, but as it is all one solution, we bring in the surge risk management side as well. There are places on the continent where we need to safeguard against on and off switching on the grid itself. When it comes to grid reliability, we should note that South Africa, by and large, measures up very well when we do not have to deal with load shedding issues.”

For more information contact Hans Oelofse, DEHN Africa, +27 11 704 1487, hans.oelofse@dehn-africa.com, www.dehn-africa.com
The Digital Maintenance Manager (DMM) from SICK Automation’s Smart Service Suite, is a service platform for managing, visualising, implementing and recording the maintenance requirements of analysis and process measurement sensors and systems in process plants. The DMM is a non-proprietary web front-end that can be used via a web interface from any device with an Internet connection. The service platform is compatible with all analysis and process measurement sensors and systems from SICK.

The DMM displays all the installed sensors and measurement systems in digital form and provides plant operators with up-to-date information about their current and future operating status. It offers plant operators the opportunity to manage and visualise the field instrumentation and to integrate it into an end-to-end maintenance and document management system. With the help of a traffic signal system, operators can immediately identify the maintenance status of sensors and measurement systems in machines and plants. This allows maintenance to be planned in advance.

Full documentation of maintenance history
The DMM allows operators of waste incineration plants, power stations, steel and cement works, and plants and refineries in the chemical and petrochemical industries to simplify their maintenance planning process. The platform arranges and reports on the maintenance activities agreed with SICK, with other providers, or with the in-house service team. Once the work has been completed, the accompanying service documentation is automatically created and updated. The integrated document management system enables operators to access all the relevant service reports for gas analysers, dust measuring devices, or emission monitoring systems, for example, at any time and with just a few clicks of the mouse. The entire test documentation is also easily available in the event of an audit.

Access to other maintenance services
The service platform also gives operators access to other LifeTime Services from SICK if required. These include a direct remote connection via the Internet to sensors and measurement systems. The condition monitoring and predictive maintenance solution allows status figures and statistics from field instrumentation to be analysed and evaluated directly in order to identify and prevent faults, failures, and the risk of damage at an early stage. Other service modules, for example for support in relation to QAL2 and QAL3, are also available. Customers can also add function tests and annual operational checks.

Entry point to process automation 4.0
By fully digitising all SICK’s analysis and process measurement systems in one plant, the DMM allows for comprehensive installed base management. It also paves the way for Process Automation 4.0 and therefore for the value-added networking of sensors and measurement systems in machines and equipment, as well as the systematic evaluation of machine and process data in order to minimise downtimes and improve the productivity of process plants.

For more information contact Mark Madeley, SICK Automation Southern Africa, +27 10 060 0550, mark.madeley@sickautomation.co.za, www.sickautomation.co.za
Verification vs calibration

Technical experts frequently come across the metrological terms of calibration and verification. For some these two concepts are known and easy to differentiate, but these two terms can also cause confusion.

**Verification made easy**

According to the International Vocabulary of Metrology (VIM), the term verification is defined as: “Provision of objective evidence that a given item fulfils specified requirements.”

An interpretation of verification consists of checking calibration results as 'objective evidence' to comply with a 'specified requirement', such as the Maximum Permissible Error (MPE), defined either by a manufacturer, a legal metrology organisation or an end-user (i.e. process application). This situation is illustrated in Figure 1, where the device's relative measurement errors obtained by the calibration rig turn out to be smaller than the MPE, meaning that the flowmeter (item) fulfils the specified requirement.

Endress+Hauser's onsite Verification offerings:

- **Heartbeat verification**
  - Heartbeat Technology verifies the correct function of the measuring device according to the specifications and generates a protocol without process interruption.
  - The automatically generated protocol supports the documentation requested by internal and external formalities, laws and standards.

- **Inline ultrasonic clamp-on verification**
  - The inline verification is a comparison of the results obtained from the unit under test (UUT) against the inline ultrasonic clamp-on flowmeter.
  - A verification certificate which indicates the measured error between both the measurements is generated.

**Calibration made easy**

According to the VIM, calibration is a procedure to establish a relation between a quantity value given by a UUT and a reference quantity value (ref) obtained by a calibration rig, within its associated measurement uncertainty. The main objective is to check the accuracy of measurements by comparing the device in question with that of a known traceable reference. One fundamental requirement for carrying out a calibration is that the reference system must have traceability to the fundamental units of measurement needed to reproduce the unit flow.

Calibration of devices assists:
- The requirements of industry regulators and standards like FDA, IFS, ISO 9000 etc.
- To prevent influence of inaccurate measurements on the quality of the final product.
- To prevent energy or material losses due to improper control.
- To prevent safety issues caused by poor monitoring.

Endress+Hauser's calibration offerings:

- **Onsite: portable rigs and buffer solutions**
  - On-site calibration is performed by highly trained engineers. It is convenient and cost effective, and removes the need to send instruments onsite, keeping downtime to an absolute minimum. It also offers the highest flexibility as calibration can be scheduled according to process demands.

- **Laboratory**
  - Laboratory calibration services are one-time or repeat contract-based calibrations of customer instrumentation carried out in a facility owned by Endress+Hauser. Calibration services performed in a laboratory have the advantages of the best calibration uncertainty and wide calibration ranges.

- **Calibration management service**
  - Calibration management service is an optimisation service where Endress+Hauser take day-to-day management responsibility of a customer’s calibration function. Goals of this outsourcing are improving a customer's plant operations, and securing calibration process compliance to internal and external regulations while reducing its costs.

For more information contact Preston Reddy, Endress+Hauser, +27 11 262 8000, preston.reddy@za.endress.com, www.za.endress.com
SKF thermal camera simplifies machine inspection

Maintenance technicians and experienced thermographers can quickly detect troublesome hotspots with the user-friendly SKF TKTI 21 thermal camera.

With a detector of 160 x 120 pixels and a visual camera, the TKTI 21 is suitable for many mechanical and electrical maintenance inspection applications. A wide temperature measurement range of –20 to +350°C makes the TKTI 21 suitable for many proactive maintenance programmes.

Visual and audible temperature limit alarm function alert the user to abnormal conditions. The automatic hot and cold spot cursors quickly pinpoint the extremes in a scene. It has up to five moveable temperature cursors/areas with individual emissivity settings for analysing complex scenes.

Temperature difference of two cursors can be displayed on screen enabling quick and easy temperature comparisons. Isotherms and temperature gradients can be displayed in area analysis boxes for advanced scrutiny, while built-in emissivity tables allow easy emissivity value setting.

Fully radiometric thermal and visual images are stored on the micro SD card provided. Images can be voice annotated for later reviewing with the PC software. The video output function allows live images to be shown on an external display, useful when showing to a group of people.

The camera is supplied with two standard camcorder batteries and an independent charger. Its rugged construction and, with an IP 54 rating, enables use almost anywhere. The comprehensive PC software suite for an unlimited number of users enables advanced image analysis and professional report writing.

For more information contact Samantha Joubert, SKF South Africa, +27 11 821 3500, samantha.joubert@skf.com, www.skf.com

Testing low frequency sensors

Accelerometers and velocity meters are used to measure a wide range of frequencies, including the low frequency vibrations encountered in building maintenance. These occur at less than 2 Hz, and can also be useful in monitoring bearing wear in cooling tower fans and gearboxes for example.

To characterise the performance of its low frequency sensors in that range, which is too low for most test shakers, Monitran has developed a high displacement test rig that can generate oscillations accurately at frequencies as low as 0.2 Hz. The system allows real-time back to back testing between different devices and its own inbuilt, calibrated MEMS sensors.

The horizontal linear beam oscillator has a powerful motion control system that incorporates a precision AC servo with 17 bit encoder feedback. Running on two precision rails, it uses magnetic springs and magnetic damping to ensure smooth operation. Its software produces fast code, at 1.7 milliradians per step, which generates fine sinusoidal motion for the linear track driven by a rotary motor.

The intelligent shuttle, which can carry a sensor payload of up to 0.5 kg, incorporates seven MEMS accelerometers, signal processing and a microcontroller to monitor its motion. It also includes a mechanical low pass filter and has an operating distance of up to 1 metre, exerting up to 8 g acceleration on the devices under test. This covers the range from over 35 kmph peak velocity, down to nearly one twentieth of walking speed.

“The oscillating beam rig gives us accurate extreme low frequency data and is a highly useful addition to our accelerometer test and calibration capabilities,” said Monitran managing director, Andy Anthony.

For more information contact Instrotech, +27 10 595 1831, sales@instrotech.co.za, www.instrotech.co.za
We understand how critical it is to find sustainable business process improvements in an ever-changing world.

PERSPECTIVE + PERFORMANCE

You streamline and automate your processes while complying with regulations and minimizing risks.

Remain compliant and minimize risk.

“We help you focus on producing higher-quality products at a lower cost. To reach this goal, we provide a global calibration program, standardized for both on-site and laboratory calibration.”

Kyle Shipps
Calibration Manager

Learn more about our calibration capabilities:
go.endress.com/za/calibration-capabilities

Endress+Hauser
People for Process Automation
SKF offers new Lincoln lubrication pinion

SKF has announced the introduction of its Lincoln lubrication pinion LP2 for open gear wheels and gear racks. Complementing SKF’s existing lubrication pinion line, the reliable LP2 features a modular design and the capability to lubricate fast-rotating applications up to 80 rpm.

As the pinion does not require pressurised air, there is no spray mist to contaminate the environment. Also, higher-viscosity lubricants, such as NLGI grade-2 grease can be applied. When compared to manual lubrication, use of LP2 provides better quality lubrication and reduces costs, labour and the risk of accidents.

The modular design enables customers to configure the lubrication pinion to meet specific application requirements in mining, construction, marine and material handling applications, as well as slewing or pitch bearings.

Combining more than 100 years expertise, SKF offers a complete portfolio of innovative lubrication solutions, from manual lubricators and tools, to the most advanced centralised and automatic lubrication systems.

For more information contact Samantha Joubert, SKF South Africa, +27 11 821 3500, samantha.joubert@skf.com, www.skf.com

More troubleshooting in less time

The Fluke 789 ProcessMeter is an advanced troubleshooting tool for electricians and instrumentation professionals, combining the functionality of a loop calibrator with the power of a digital multimeter. By equipping the 789 with a temperature measurement module and the wireless data logging capabilities of Fluke Connect with ShareLive video call (sold separately), process technicians can now do a lot more while carrying a lot less. And with its built-in, selectable 250 ohm HART resistor, it eliminates the need to carry a separate one.

Monitor temperature and electrical parameters at the same time

The FC Wireless K-Type temperature module can be used for day-to-day troubleshooting applications. It measures temperature in one location and then wirelessly relays the results to a smartphone (with the Fluke Connect app installed). This comes in handy for checking multiple components of heating and cooling systems simultaneously.

For example, at one site, a temperature module was set up to monitor refrigerant line temperatures while a technician worked on the refrigeration components located elsewhere. It was also used on split system chillers. In one instance the chiller, which had microprocessor-based control, was located in the basement, while the air-cooled condenser was located on the roof. The technician was able to oversee the fan-cycling controls by measuring the motor draw using the a3000 FC current clamp. At the same time, he monitored the liquid line temperature using the temperature module, and observed a specific percentage on the microprocessor in the basement. He viewed the results from all three tools simultaneously, in real time, on his smartphone.

Finding a needle in a haystack

With the Fluke Connect DC voltage module, another user measured a 0-10 VDC signal to a variable frequency drive located in a supply air cabinet. The third-party panel was inaccessible so the VFD was the only place to test. “If I had tried to monitor the third-party signal at the VFD with a standard meter, it would have tripped an alarm due to ‘no proof of air flow’ by the air flow switch,” he said. “Using the Fluke Connect DC voltage module I found that the building automation system was not sending the proper ramp signal when duct static pressure dropped.”

This same FC module also helped him to find a chronic problem in a DC power supply that was intermittently dropping the 5 V it supplied, which caused a chiller to fail and trigger an alarm. The DC voltage module was left on the power supply overnight. “The results showed that the power supply dropped voltage and then restored itself,” the technician said. “I replaced it with confidence the next day. These meters are of incredible value when tests need to be conducted outside electric panels and in remote locations.”

For more information contact Comtest, +27 10 595 1821, sales@comtest.co.za, www.comtest.co.za
Configurable signal lamps with IO-Link Technology

High performance
Signal lamps are used for status indication or as warning device everywhere in factories on machines, conveyors and installations.

ifm’s innovative signal lamps offer several advantages over conventional signal lamps and are therefore suitable for demanding applications.

Flexible configuration
In general signal lamps must be adapted to the application.
Instead of spending time and effort on screwing modules of different colours together, the new LED RGB technology makes it possible to adjust the signal lamp as needed via IO-Link or setting button.

Different settings include permanently on, low flash rate, high flash rate, different colours & siren. This reduces type variety and stock-keeping.

ifm – close to you!
www.ifm.com
International: +27 12 450 0400
Robot-assisted machinery for the fish industry

Fully automated deboning and filleting of fresh fish.

The Icelandic company Valka, headquartered in Kópavogur, specialises in the development of automation solutions for the fish industry and has made a name for itself with technological innovations in this market, which is characterised by demanding production requirements. The system developed by Valka produces extremely precise cuts at different angles through a combination of X-ray radiation, 3D image processing and a robot controlled water-jet cutting head. Fully automatic deboning, filleting and portioning of fresh fish are accomplished quickly, reliably and efficiently, giving the company's customers key competitive advantages.

"In the past we worked with different technologies and suppliers, which made the variety of interfaces increasingly difficult to handle," explains Valka's marketing manager Ágúst Sigurðarson, describing the initial challenge that arose two years ago. "That is why we decided to revise our automation infrastructure by choosing the open PC and EtherCAT-based platform from Beckhoff as the universal controller."

"Today, we can say we made the right decision," adds Einar Björn Jónsson, product development manager at Valka. "Instead of special components from various suppliers we now use standard components from Beckhoff. The PC-based control platform integrates all necessary functions, from the PLC and the robot axes through to the safety systems and the HMI."

**Centralised control platform**

The control platform of the cutting machines consists of a C6920 control cabinet industrial PC with Intel i7 quad-core processor and TwinCAT 3 automation software. All four processor cores are utilised in order to exploit the full performance of the IPC: the operating system and the motion control technology each use one core, while the PLC uses two cores. On the networking side, compact EtherCAT I/O modules are used for the I/O connections. Safety technology is also integrated seamlessly into the control system via EtherCAT safety I/O modules. The motions of the cutting robot are controlled in software via TwinCAT NC I and TwinCAT Kinematic Transformation, while AXS203 EtherCAT servo drives and servomotors from the AM8000 series with One Cable Technology are used as the drive technology.

The Valka cutter removes bones and cuts the fish into precise portions fully automatically. "We developed a combination of X-ray radiation, 3D image processing and robot-controlled water-jet cutting heads that makes it possible to identify even very fine bones down to a width of 0,2 mm," stresses Jónsson. "The robots can work at different cutting angles and cut the bones out with such high accuracy that we now have losses of only 4 percent compared to 6 percent previously. For our customers this means additional revenues of several million kroner per year, depending on the tonnage of fish processed. Each fish fillet is analysed precisely and cut into even portions with regard to size, weight and thickness according to the respective specification. In addition, different cutting patterns or programs can be defined in the software and various fillet sizes can be determined flexibly.

A key feature of these robotic solutions is that they are operated with a standard software platform, entirely in keeping with the philosophy of Beckhoff that all software tools must function on a simply structured platform.

Iceland and Norway are among Valka's most important sales markets. "With our faster and more intelligent production solutions we are also increasingly gaining market share in the rest of Europe and in the United States," concludes Sigurðarson. "That's an exciting development, and this progress is all backed by reliable technological support from Beckhoff."

For more information contact Michelle Murphy, Beckhoff Automation, +27 11 795 2898, michellem@beckhoff.com, www.beckhoff.co.za
Intuitive, easy-to-use EZ-SCREEN® LS safety light screens are designed for machine safeguarding and are built to withstand challenging environments common to both manufacturing and packaging. The alignment indicators are highly visible and intuitive diagnostics simplify setup, facilitating troubleshooting and streamlining installation. Each light screen is built with metal end caps, a thick aluminum housing and a recessed window to avoid damage from impact. Standard pairs, cascade systems and extensive accessories are available.

RET Automation Controls (Pty) Ltd | P.O. Box 8378 Edenglen 1613 | Phone: 011 453 2468 | sales@retaautomation.com
Alien Systems & Technologies designs and supplies automatic fire extinguishing systems for customers that want to protect rooms containing valuable company assets or key processes that the business relies on. Such systems include the Pyroshield gaseous automatic fire extinguishing systems, designed for applications like server rooms and datacentres, substations, UPS rooms, archive rooms, sensitive document stores, museums, flammable liquid stores, flammable gas stores and other intrinsically safe areas.

Customers usually select products on performance and price, but sometimes overlook what actually happens when a fire does occur. In recent months AST has had to deal with three fire events. Firstly, there was a fire at a large international insurance company. The fire occurred within the main datacentre, where a UPS malfunctioned and caught alight. The Pyroshield System operated and extinguished the fire within 30 seconds limiting damage and reducing the event to a ‘minor incident’.

The second incident occurred within weeks on Johannesburg’s East Rand. The fire again occurred in a server room, and as in the first incident, the Pyroshield System operated and rapidly extinguished the fire.

A month later there was another incident in the East Rand area, this time it occurred in an intrinsically safe area, extremely high-risk because of its potentially explosive atmosphere. A fire in this room, if not checked, could have resulted in a catastrophic explosion. Once the fire started, the Pyroshield System operated and extinguished a very high energy fire.

But what happened after the fires?

On each occasion, the Pyroshield System worked 100%, saving customers from potentially severe incidents that could have yielded substantial losses, damage and possibly loss of life. Nevertheless, after the fires were extinguished, the customers had to deal with investigations, restoration of the protected area, claims and disruption. One of the key priorities is always to restore fire protection, and this is where AST offers a superior service.

The company has invested significantly in infrastructure to ensure that customers receive fast response and the highest levels of service. This includes a dedicated cylinder transport service, rapid refilling and our SANAS and DOL approved hydrostatic pressure testing facility – all done in-house. Should cylinders require hydrostatic pressure testing, the test is free. Should customers have a fire, AST does not charge for the refill.

In the case of the first fire, AST had replacement Pyroshield Cylinders, onsite, within six hours, leading to full protection cover restored in nine hours. The customer was extremely satisfied. In the case of the second fire, AST had full Pyroshield Cylinders onsite within five hours. The customer was again extremely satisfied. The third fire occurred on a Friday evening after hours. AST was notified at 6.45 pm and the response team reacted immediately and fire protection had been restored by the following morning. The customer was extremely satisfied.

These are just a few real-world examples of where AST has demonstrated its commitment to service after a customer experiences a fire. It also serves to demonstrate that purchasing a fire protection system not only involves decision criteria such as quality and price, but indeed the fire protection engineering company itself, its capabilities, and its commitment to customers when things go wrong. This is where a dedicated fire protection engineering company can make things right quickly so that the businesses can continue to operate with minimal disruption – a responsibility that AST is committed to (www.facebook.com/astafrica/?ref=settings).

For more information contact Grant Wilkinson, Alien Systems & Technologies, +27 11 949 1157, sales@astafrica.com, www.astafrica.com
LSIS is changing perceptions

Setting new standards in Ultimate performance with many innovations.

This range offers maximum fully integrated systems.

With its high functionality, the LSIS range supports from simple control system to complex tasks.

Communication functionality is the system's strength and offers user-orientated integrated control with its free development software.

Based on its strengths, the LSIS PLC can be used in many application fields with a host of expansion modules to assist.

- High speed, high performance PLC range
  - XGi, fully redundant, Marine approved
  - XEC, Block system with EtherNet and WebServer

- Performance HMI range
  - iXP2, 1GHz Dual-Core CPU with 1GB Flash Ram
  - iXP, 1GHz with Marine and EX approved ratings
  - eXP, 454MHz Processor with 64mb programming space

- 0.2kW - 10MW Motor drive
  - M100, Single to 3pH 0.2kW - 2.2kW
  - S100, IP20, IP66 and *PM motor options*
  - H100, Dedicated HVAC and PV options
  - M1000, 3.3kV - 13.8kV Medium Voltage Drive
  - 3pH Permanent Magnet Motors, 1.5kW - 45kW

- Free development software
  - XG5000, ST, SFT and LD PLC software
  - XP Builder HMI development tool with >160 comm drivers
  - DriveView7 Drive implementation software

Ana-Digi Systems, importers and official distributors for LSIS in Southern Africa
Phone: 021 914 9030 / 011 704 0144
Email: info@anadigi.co.za
www.lsis.co.za
SEW-Eurodrive is once again expanding its range with the launch of its ECDriveS brushless DC gearmotor. This drive system is a simple, efficient and cost-effective solution for the lower power range of light-load roller conveyors. It will be on show in March at bauma CONEXPO AFRICA 2018, together with SEW-Eurodrive’s full portfolio of gearmotors, motor starters and decentralised drives. Motion Control’s editor paid a visit to national sales manager Norman Maleka to find out more.

“We call it the Easy Drive because it is so easy to work with,” explains Maleka. “It’s a simple plug-and-play system that is easy to set up, install and maintain without any parameterisation or programming using a PLC.” The drive comprises a 24 V DC brushless motor in roller form, together with a gear unit. A communication interface controls the speed of the motor and when it should stop. It can be set up using dual inline package (DIP) switches, or programmed with SEW-Eurodrive software. A big advantage is that the ECDriveS is easily integrated into existing applications and platforms such as Ethernet and Profinet, so there is no need for users to change their network.

Tailored for small conveyors, the ECDriveS drive is very compact, and the rollers come in sizes ranging from 300 to 1200 mm. The maximum velocity of the driven roller ranges from 0,04 to 5 m/s, and 8,5 up to 645 rpm for the gearmotor. It meets IP54 protection rating, with IP66 being available on request. This means it can be used for food and beverage applications as well. The temperature range is from -10 to 40°C with a -3°C option included.

It has a 250% overload capacity at 40 W S1 power rating and optimised gear construction for a long service life, even at a high capacity utilisation.

These conveyors are typically found in packhouses in farming and agricultural applications that transport empty boxes. Here most of the items are packed manually, and then placed on a conveyor to be sent outside and loaded onto a truck. However, SEW-Eurodrive has had considerable interest in other applications, and Maleka says that a major automotive manufacturer is considering the ECDriveS for the transportation of boxes containing small parts to the production line. “It is not only small customers that can use the system, but big customers with small applications,” he continues. “These small conveyors provide in-feeds of all sorts of components such as tyres, and the ECDriveS can help to reduce total costs along the supply chain.”

Maleka notes that, while the product is easy to use, behind the scenes it is backed by the full force of SEW-Eurodrive’s high end technology. The gearmotor is directly integrated into the roller. The external commutation electronics have Ethernet-based zone controls or binary control. Ethernet controls featuring integrated conveyor logistics provide both conveying with zero pressure and decentralised solutions for a wide range of conveying tasks.

Another advantage is that the integrated encoder allows for precise positioning of ramp-up and ramp-down on the conveyor, as well as varying the speed. This enables items to be positioned accurately where they need to stop. There are also inputs and outputs fed back to the system, which can send an alarm to alert the user in the event of any problem.

Maleka explains that SEW-Eurodrive’s overall strategy is to cover all gaps in its product Offering. He continues: “Applications evolve along with changing customer requirements, and we identified a new opportunity. We realised customers are now wanting something smaller, more cost-effective, quicker to build and easier to handle. These applications do not need much power.”

SEW-Eurodrive keeps over R130 million worth of stock, with servicing back-up in all the company’s branches countrywide. Maleka notes that stock of the ECDriveS is coming in soon ahead of the launch, together with test units to enable customers to try out the system, and samples for an awareness campaign. “This is a huge market and very competitive. We are giving ourselves a year to focus, get out and create awareness, and develop the market,” he adds.

“We used to be known solely as a component supplier and a gearbox manufacturer, but now with our wide range of products, we partner with system designers and integrators, as well as OEMs, to develop total solutions. This is in line with our strategy of system integration for the provision of total solutions,” he concludes.

For more information contact Jana Klut, SEW-Eurodrive, +27 11 248 7000, jklut@sew.co.za, www.sew-eurodrive.co.za
The range of Hengstler incremental encoders offers users optimum flexibility with an encoder available for every application. There are over 20 standard models from which to choose, including encoders for solid or hollow rotating shafts from 4-42 mm in diameter and up to 10 000 PPR (pulses per revolution). A choice of heavy or light duty is available and there are multiple connection options facilitating a fit-for-purpose encoder.

The RI32-O is popular for light duty applications. The shaft is aluminium and the 30 mm diameter housing is constructed of plastic material with protection class ratings of IP40 and resolutions of up to 1500 PPR.

Known as economy encoders, the RI38-O is also favoured for light duty applications. The shaft is made of stainless steel and the housing is constructed of glass fibre reinforced plastic material. A 6 mm diameter solid shaft version is available with a protection class rating of IP40 and resolutions of up to 1024 PPR.

The RI58-O is a universal industry standard encoder. The 58 mm diameter housing is aluminium, while the shaft is stainless steel. This encoder offers a choice of product configuration options.

Designed for direct mounting onto rotating shafts, the RI58-D is secured by a front clamping ring and the main body of the encoder by a stator coupling or set screw. The through-shaft design allows for unrestricted mounting depths as the shaft passes completely through the encoder body. The front clamping ring version is available with shaft diameters of 10 mm and 12 mm, and a protection class rating of IP64 with resolutions of up to 5000 PPR.

Also, directly mounted onto rotating shafts, the RI76TD is secured by a front flexible tether allowing for mechanical stresses caused by angular, axial or radial misalignment between the rotating shaft and the encoder. Again, the design of this encoder allows for unrestricted mounting depths as the shaft passes completely through the encoder body.

The full range of Hengstler incremental encoders is available from Johannesburg-based Countapulse Controls, which offers a full technical advisory service assisting customers to select the most appropriate encoder for the given application.

For more information contact Gerry Bryant, Countapulse Controls, +27 11 615 7556, bryant@countapulse.co.za, www.countapulse.co.za
Simex, a South African company specialising in the fabrication and upgrading of flight training devices like flight simulators, contracted Tectra Automation to upgrade software, supply new hardware, and adjust and convert a portion of the motion logic control across a number of flight simulators. The conversions, implemented for software compatibility purposes, pertain to the controls directing inflight aircraft angles, roll and pitch.

The simulators benefiting from the upgrades are the Embraer 120 and the King Air 200, 350 and 1900, located at Lanseria airport, and a generic twin-piston simulator, based on a Piper Seneca V, at Port Alfred airport in the Eastern Cape. All force-feel and control-loading equipment and componentry used for the simulator upgrades are Bosch Rexroth engineered.

Under-resourced componentry and a software upgrade

The Embraer 120, an FNPTII (flight navigation and procedures trainer) fixed-base simulator, which is used for imitation training and proficiency checks, experienced compatibility issues with the motor program and motion logic controller (MLC) device. As the components are Bosch Rexroth, Simex approached Tectra Automation in Johannesburg for assistance. The fault lay in under-resourced componentry (known as CML) for a program contained within the MLC, which Tectra Automation resolved by replacing the existing CML25 with a CML45 and adjusting the software programming.

Wiets Pretorius, electric drives and controls manager at Tectra Automation, verified the fault, provided and installed the correct hardware and adjusted the software to ensure compatibility. Commissioning was conducted jointly by Simex and Tectra Automation, and subsequently reconstructed and approved by the South African Civil Aviation Authority (SACAA), the aviation industry regulator in South Africa. “All of this was completed within standard industry time expectations and to our exact requirements,” comments Leon Postma, simulation engineer at Simex.

Based on the successful conclusion of the Embraer 120 project, Simex again contracted Tectra Automation, this time for two other simulator projects, both of which are ongoing. The Port Alfred-based generic twin-piston simulator had been upgraded with new motors and requires higher grade firmware and the King Air three-way simulator (200, 350 and 1900) involves work on its control loading.

The firmware upgrade for the twin-piston simulator however, proved to be incompatible with the PLC, leading to a PLC firmware upgrade. This entailed motor parameter checking and adaption to the motor programming to correct an inverted analog signal – both of which were conducted remotely.

Tectra Automation also supplied all the required Bosch Rexroth equipment and components for the control loading of the King Air 200, 350 and 1900 simulator, which can be adapted to duplicate the aeroplane cockpits of any of the three aircraft types through the use of interchangeable panels.

All Bosch Rexroth hardware has been delivered to site and Tectra Automation is on standby to assist with commissioning, once Simex has completed the installation. “For all of these projects, which first began in 2017, we have not experienced any unsolvable challenges subsequent to Tectra Automation’s involvement,” concludes Postma. “The service we have received exceeds even the high quality of the Bosch Rexroth equipment they represent, if one could draw a quality comparison.”

For more information contact Wiets Pretorius, Tectra Automation, +27 11 971 9400, wiets.pretorius@tectra.co.za, www.hytecgroup.co.za
Yokogawa has added a network function to the UM33A digital indicator with alarms. With this network function, a single UM33A digital indicator can receive, process and sequentially display data from up to eight sensors. The enhanced UM33A is an easy-to-install and cost-effective solution that enables the monitoring of data from multiple field sensors. By improving the functions of its UTAdvanced product line, Yokogawa aims to satisfy the latest customer needs and expand its controller business.

In recent years, there has been a growing need to improve the monitoring of data from field sensors. For safety and other reasons, operators need the ability to monitor data remotely from sensors that are installed high up, in confined spaces, and in other locations where it is difficult to visually check the readings on the sensor displays. The UM33A digital indicator that Yokogawa has been offering until now accepts analog data from sensors that measure parameters such as temperature, pressure and flow rate, converts this data into digital signals, and displays the readings. It can also issue an alarm if an input signal falls outside a preset range. However, it is only able to accept data from a single sensor. To check data from multiple sensors, it is necessary to install and configure other equipment, such as a touch-panel with an embedded controller or some other type of user interface used in combination with a programmable controller (PLC). This equipment is both expensive and requires a lot of engineering.

Yokogawa has improved the functions of the UM33A to satisfy the needs of customers who want to check measurement data from multiple sensors in the field. The enhanced UM33A can be installed easily and at a lower cost. The new features are:

- **Easy to introduce/improved monitoring of data:** The enhanced UM33A supports the master function and the data monitoring function of the Modbus/RTU communication protocol, and is able to connect with up to eight sensors and sequentially display data from those devices. The UM33A is thus able to monitor data from multiple field sensors without requiring the installation and engineering of a separate device with user interface and controller functionality. It can also function alongside already installed systems that employ such specially configured hardware. With its ability to remotely connect with multiple sensors throughout a site, the enhanced UM33A makes it easier for plant personnel to check measurement data from these devices.

- **An enhanced field digital solution:** In plants, progress is being made in the introduction of field digital solutions that rely on digital communications between intelligent field devices and control systems. Field digital solutions allow the transmission of significantly greater amounts of data, including not only data on process parameters, but also instrument status information. The ability to monitor this information online improves maintenance efficiency. Thanks to its functional enhancements, the enhanced UM33A can handle both digital and analog communications with sensors, and is thus well positioned to facilitate the introduction of field digital solutions at plants.

For more information contact Christie Cronje, Yokogawa South Africa, +27 11 831 6300, christie.cronje@za.yokogawa.com, www.yokogawa.com/za

---

Achieve flexible production with integrated robotics solutions

The new Omron Robotic Automation enhances the most demanding manufacturing lines. Realize faster line start-up & change-over, implement easier to use technology & vertical line integration, and facilitate faster data capture & analysis to increase your in-line efficiency.

Our industrial robotics range from articulated, SCARA, and DELTA to collaborative (mobile) robots that optimize the handling of varying lot sizes and diverse products, formats and qualities. Achieve flexible production with integrated robotics solutions that give you a competitive edge!

Discover how to improve your flexible production, contact us:

- +27 (0)11 579 2600
- info.sa@eu.omron.com
- industrial.omron.co.za

www.industrial.omron.co.za
How to choose the right cable

Cables are an essential part of any industrial application. Therefore, it is important to make sure to choose the appropriate cable material for the environment, especially where chemical cleaning solutions, cutting fluids, and other caustic liquids are present. The two main types of cables used in industrial applications are either PVC or PUR, and they are each suited to different types of environments. This article describes the difference between PVC and PUR cables and when to use them.

PVC cables and when to use them
Polyvinyl chloride (PVC) cables are an excellent choice for most chemical washdown applications in the food and beverage industry. They have excellent resistance to cleaning solvents including:
• Sodium hypochlorite.
• Sodium hydroxide.
• Potassium hydroxide.
• Peracetic acid.
• Hydrogen peroxide.
• Quaternary ammonium compounds.

It is also important to take into consideration the concentration of chemicals, temperature of the process, and the duration and frequency of exposure, since these factors can impact the suitability of PVC for these applications. Furthermore, PVC has limited resistance to oils, making it less suited for automotive and machine tool industries.

In addition to being resistant to common cleaning chemicals, PVC cables are generally more rigid than other types of cables. This makes them suitable for use in applications where they will be exposed to high temperature, high pressure washdown as the rigidity of the sheathing protects the cable from damage.

A PVC cable with IP69K rating means it is sealed against the ingress of water even during washdown. However, the rigidity of PVC cables can be a disadvantage in freezer applications, where low temperatures can cause the material to crack if the cables are flexed. Discuss specific applications with an expert to determine the best cable material in these circumstances.

PUR cables and when to use them
Polyurethane (PUR) is a thermoplastic material used for cable jackets. Since PUR cables are resistant to cutting fluids, oils, and other harsh chemicals, they are a good choice for many automotive manufacturing, stamping and machining applications.

PUR cables also have high tensile strength, tear and abrasion resistance. They are also extremely flexible, with a small bend radius. This makes them ideal for applications where connections move or bend frequently, such as robotic applications.

For more information contact Brandon Topham, RET Automation Controls, +27 11 453 2468, brandon.topham@retautomation.com, www.retautomation.com

Bus couplers in accordance with Profinet

In Profinet applications, the Axioline F bus coupler is the link between the Axioline F system and the higher-level Ethernet system. As Phoenix Contact’s first Profinet bus coupler, the TPS version of the device offers certification in accordance with Profinet Spec 2.3.

The bus coupler also features PROFInergy support. This feature uses cutoff mechanisms to save energy when in an inactive state. In addition, the web-based management feature, which can be used for retrieving static information (such as technical data), MAC addresses, and dynamic information (such as IP addresses), has been expanded.

For testing purposes, the Axioline F station can be started up independently of the higher-level network via the service interface or an Ethernet port on the bus coupler using the Startup+ software.

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

THIS IS SICK

Sensor Intelligence.

Since the invention of the light curtain, SICK has spent more than half a century developing pioneering innovations for a safer industrial world. The market leader for safety technology is now once again entering a whole new age with a new generation of safety laser scanners, light curtains, switches and encoders: microScan3, deTec4 Prime, STR1 and DFS60S Pro. Whatever angle you approach industrial safety from, there are common aims: to set new standards for safety and productivity and to enable customers to implement pioneering solution concepts their way. We think that’s intelligent. www.sick.com
Optical positioning system knows the way

The PGV (position guided view) positioning system from Pepperl+Fuchs consists of a 2D vision sensor with integrated LED lighting, a coloured tape as an optical route indicator, data matrix codes as a tape or tag for the identification of positions, and control codes for vehicle navigation at intersections, branches, or endpoints.

Safe and precise navigation at all times

The tracking of route indicators and codes is contrast-independent and resistant to extraneous light due to the specially focused optics. With powerful integrated signal processing, the PGV sensor can identify the X, Y and Z position (where Z is the distance from the AGV to the floor) of the AGV with precision at any time. The optical positioning system detects its angle from the route-tracking tape so that the direction in which the AGV is travelling can be corrected automatically. The sensor tolerates interrupted or dirty tape over a distance of 60 mm.

Integration-friendly sensor concept

The housing of the PGV sensor is compact, shock resistant, and impact resistant with the IP67 degree of protection. It is mounted on the bottom of the AGV, without the need for time-consuming alignment. When it comes to control technology, the positioning system can be linked to RS-485 and all common fieldbuses.

The camera-based PGV system enables AGVs and other autonomous vehicle concepts to navigate freely with no extensive ground work, such as that required for inductive or magnetic route tracking technologies, necessary. Distances, intersections, branches, buffer sections, or transfer points can all be set up quickly by the simple application of route-tracking tape and visually detectable marks on the ground. PGV offers flexible integration options in relation to the common AGV vehicle controls and fieldbuses.

Reliable navigation with Leuze laser scanner

The Leuze RSL 400 safety laser scanner with measurement value output is setting new standards in the reliable navigation of automated guided vehicles (AGVs).

The new scanner is the result of many years of experience and combines safety technology and qualitatively superior measurement value output in a single device. This enables reliable safeguarding and navigation of AGVs. Measurement value output is optimised to navigation software that functions according to the principle of natural navigation with SLAM (simultaneous localisation and mapping).

Due to its high angular resolution of 0,1 degrees, the Leuze RSL 400 offers extremely detailed scanning of the environment across the entire measurement range of up to 50 metres. This is achieved through a particularly narrow laser spot that maintains its perpendicular shape over the entire scanning angle. The distance values have a high accuracy and are not influenced by reflection of objects.

The additional output of the received signal strength value for each beam allows autonomous detection of reflectors by the navigation software. When beams strike a reflector, the values differ greatly from any other environment, which facilitates reliable detection.

With up to 100 switchable field pairs, the scanner offers optimum adaptation of the protective fields, even in cases where there are many different movement and loading conditions. Parallel monitoring of multiple protective fields enables safe and reliable reduction of the speed of AGVs.

These new functions are also available as a device model with Profinet/Profsafe interface, thereby making integration extremely easy.

For more information contact Pepperl+Fuchs, +27 87 985 0797, info@za.pepperl-fuchs.com, www.pepperl-fuchs.co.za
Emerson’s latest capital project technology enables chemical, life sciences, oil and gas, and other industrial manufacturers to scale automation, simplifying project execution. As capital projects grew in scale and complexity in the last 25 years, process industry organisations experienced unforeseen cost overruns and schedule delays, resulting in billions of dollars in losses annually. Project teams responded by adopting modular construction strategies: multiple vendors across the globe working on different elements of a project and then integrating on site. While modularity simplified construction, it added complexities to onsite integration. Different process units using different control strategies and automation technologies increased project complexity.

To help organisations achieve on time and on budget execution, Emerson launched the Project Certainty initiative to transform capital project execution by defining project goals and adopting high-impact strategies that eliminate costs, reduce complexity, and accommodate late changes.

With the launch of the DeltaV PK controller, the company has now taken the next step by innovating flexible technologies to ensure project success. More powerful and versatile than previous versions, the new controller is tailored to streamline execution of capital projects. The DeltaV PK Controller is designed specifically to assist industries relying on complex, non-integrated PLCs to simplify capital projects. The DeltaV PK is a revolution in automation for capital projects efficiency.

**Flexible controller technology removes project roadblocks**

**Powerful, standalone and easily integrated**

The controller can operate as a standalone and later be merged into a DeltaV DCS, eliminating onsite integration challenges. OEM modular construction can easily be merged into a DeltaV DCS on site without complex data mapping.

With a built-in OPC UA server and Ethernet connectivity, the controller can securely connects to the IoT, cloud-based analytics and third-party software, without adding footprint, additional hardware, or reengineering. Whether standalone or fully merged, the DeltaV PK Controller delivers the features of a full-scale DCS, including batch production, recipe management, execution and historisation.

Emerson is committed to delivering flexible solutions, helping organisations adapt technology to projects rather than adapting projects to available technology. The DeltaV PK Controller facilitates the promise of modular construction, ensuring that efficiencies gained in construction are not lost during commissioning and start-up.

*For more information contact Rob Smith, Emerson Automation Solutions, +27 11 451 3700, rob.smith@emerson.com, www.emerson.com*
I/O and serial data via a wireless interface

The proprietary Radioline wireless system from Phoenix Contact is now able to transmit I/O signals and serial modbus/RTU data in parallel. Devices with firmware 1.80 or higher support dual mode PLC/modbus RTU, while any older devices can be updated via the PSI-CONF 2.50 software free of charge. I/O modules from the product range can then be added to a Radioline device and additional modbus/RTU slaves can be connected via the serial interface.

This dual mode now makes it possible to transfer information from a serial measuring station and additional I/O data simultaneously. This data can, for example, include door contacts or alarm signals from passive sensors.

While in the past, a parallel communication path or additional modbus/RTU station was required for this purpose, the I/O function of the Radioline system can now be accessed.

Run five essential lighting tests in 30 seconds

Building maintenance technicians for commercial, retail or institutional facilities with fluorescent lighting have hundreds, if not thousands of fluorescent tubes that have to be routinely checked and maintained. Even though those tubes last for tens of thousands of hours, they do ultimately fail, some prematurely, and some stop working because of other problems with the installation ballast.

In the past, this type of maintenance has usually meant lots of trial and error. If a light was found to be out, the technician would have had to climb a ladder, open up the cover, remove the bad tube and replace it. If the new tube did not light, the technician either tried again or had to call an electrician or bring out a voltage tester.

Fluke has now developed a tool that takes the trial and error – and a significant amount of time – out of maintaining fluorescent lighting. The Fluke 1000FLT Fluorescent Light Tester, specifically designed for building maintenance professionals, is an all-in-one fluorescent lamp tester, ballast tester, non-contact voltage tester, pin continuity tester and ballast-type discriminator.

Some fluorescent lighting testers on the market may have one or two testing features. Fluke developed a device that takes care of all the essential lighting tests, saving time, tool bag space and trips up and down ladders. Instead of having to carry two or three testing tools, the 1000FLT is able to make all of the following measurements:

- **Lamp test**: Allows testing without removing the tube from the ballast. The tester sends a pulse of energy that lights up the tube if there is gas in it. The 1000FLT is compatible with T5, T8 and T12 fluorescent tubes.
- **Ballast test**: Determines whether the ballast is working.
- **Non-contact voltage test**: Checks for the presence of voltage without touching the source.
- **Pin continuity test**: Tests whether filaments in the tube have continuity.
- **Ballast-type discriminator**: The 1000FLT is the first multi-function tester to include this feature, allowing technicians to easily identify whether the ballast is electronic or magnetic without taking the fixture apart or even climbing a ladder. The tester is aimed at the ballast from the ground and it immediately identifies if the tube is the old-style, power hungry magnetic ballast, for maintenance or replacement.

The 1000FLT’s user interface was designed to be as simple as possible, with all tests delivering instant results. The ballast, voltage and pin continuity tests indicate results with either a Go or No Go indicator light. The ballast-type discriminator lights up either the magnetic or electronic LED on the face of the tester, while the lamp test result is determined by the user if the tube lights up or not.

Users can run all five tests on the 1000FLT in about 30 seconds, so if one has hundreds of fluorescent lights to maintain, it can save hours of testing time every week. One customer has reported a saving 40 to 60 minutes by testing roughly 50 light fixtures per day using the 1000FLT.

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

For more information contact Sheree Britz, Phoenix Contact, +27 11 801 8200, sbritz@phoenixcontact.co.za, www.phoenixcontact.co.za
The electrical vacuum generator ECBP from J. Schmalz is ideal for handling airtight and slightly porous workpieces. It features an integrated speed control, which regulates the power of the pump to suit the process or workpiece. Moving porous workpieces, such as cardboard for example, requires considerable suction capacity and thus considerable energy. Airtight materials, on the other hand, require less power, meaning the user can reduce the speed. This degree of flexibility makes the vacuum generator extremely energy efficient.

As the vacuum is generated without compressed air, the ECBP is particularly useful in mobile robotics, and its fully automated small parts handle just as well for stationary handling tasks. Different grippers from the Schmalz VEE modular system can be attached simply and easily via integrated flanges. Connection to lightweight robots from different manufacturers works in the same way.

Via the data interface, the ECBP provides users with energy and process data via IO-Link from the machine to the cloud. The condition monitoring function recognises deviations in the vacuum supply, for example, thus reducing faults and downtimes. Furthermore, the user has various options for adapting pump capacity to the handling process. The ECBP can be parameterised directly on the device, using an NFC-enabled mobile terminal, or via IO-Link in the control centre, for example.

Thanks to the plastic housing, the gripper weighs just 700 g and is designed in such a way that there are no interfering contours. The electrical connection to the pump is established via an 8-pin M12 connector. The maximum suction capacity is up to 12 litres per minute at a maximum current strength of 0.7 A.

For more information contact Malan Bosman, Tectra Automation, +27 11 971 9400, malan.bosman@tectra.co.za, www.hytecgroup.co.za

---

The magnetic sensing principle on ifm electronics' new shaft encoders combines the accuracy of photoelectric encoders and the robustness of a magnetic system. The days of confusing type variety and encoders with complicated programming are finally over.

The new incremental encoders can be used universally due to the intelligent product and function design, and stand out thanks to a superb price/performance ratio:
- Set the resolution individually.
- Choose between TTL or HTL logic.
- Use the rotatable M12 connector radially or axially.

IO-Link communication
Process values, parameter setting and diagnostic data can be transmitted via IO-Link to make preventive servicing easy.
Visit ifm at Electra Mining Africa Expo 10-14 September in hall 7, stand C01 to view live product demonstrations as well as other new and innovative technology offerings.

For more information contact ifm electronic SA, 086 143 6772, info.za@ifm.com, www.ifm.com

---

The new SAB series sensor array bar is ideal for use on conveyors and chutes in the material handling industry. Each array conveniently fits multiple QS18 sensors into a robust aluminium housing for use on heavy-duty packaging lines. The standard sensor array bar models work well for some of the more common conveyor and chute widths.

Key benefits
User-specific arrays: SAB sensor array bars can be made to meet specific customer needs. Users follow easy-to-understand design rules to select a sensing mode and the appropriate number of QS18 beams. The length of the aluminium housing can be customised to fit a wide variety of lengths that may be needed on a conveyor belt or chute. Contact material handling business development managers for custom opportunities.

Ease of use and convenient installation: affixing multiple QS18 sensors inside one aluminium bar makes installation and alignment easier than working on each sensor individually. Using a single device for this task also means effortless wiring with only one M12 connector to power all the sensors and consolidate the individual outputs into one discrete output.

Heavy duty design and improved stability: the robust aluminium extrusion and sturdy mounting ensure long service life in challenging environments and protects the array bars from impact and vibration. This rugged system resists vibration damage and prevents the sensors from shifting out of alignment. This ensures consistently reliable results.

For more information contact Brandon Topham, RET Automation Controls, +27 11 453 2468, brandon.topham@retautomation.com, www.retautomation.com

---

Shaft encoder with display and IO-Link
The new SAB series sensor array bar is ideal for use on conveyors and chutes in the material handling industry. Each array conveniently fits multiple QS18 sensors into a robust aluminium housing for use on heavy-duty packaging lines. The standard sensor array bar models work well for some of the more common conveyor and chute widths.

Key benefits
User-specific arrays: SAB sensor array bars can be made to meet specific customer needs. Users follow easy-to-understand design rules to select a sensing mode and the appropriate number of QS18 beams. The length of the aluminium housing can be customised to fit a wide variety of lengths that may be needed on a conveyor belt or chute. Contact material handling business development managers for custom opportunities.

Ease of use and convenient installation: affixing multiple QS18 sensors inside one aluminium bar makes installation and alignment easier than working on each sensor individually. Using a single device for this task also means effortless wiring with only one M12 connector to power all the sensors and consolidate the individual outputs into one discrete output.

Heavy duty design and improved stability: the robust aluminium extrusion and sturdy mounting ensure long service life in challenging environments and protects the array bars from impact and vibration. This rugged system resists vibration damage and prevents the sensors from shifting out of alignment. This ensures consistently reliable results.

For more information contact Brandon Topham, RET Automation Controls, +27 11 453 2468, brandon.topham@retautomation.com, www.retautomation.com

---

Sensor array bars for detection across conveyors and chutes

The new SAB series sensor array bar is ideal for use on conveyors and chutes in the material handling industry. Each array conveniently fits multiple QS18 sensors into a robust aluminium housing for use on heavy-duty packaging lines. The standard sensor array bar models work well for some of the more common conveyor and chute widths.

Key benefits
User-specific arrays: SAB sensor array bars can be made to meet specific customer needs. Users follow easy-to-understand design rules to select a sensing mode and the appropriate number of QS18 beams. The length of the aluminium housing can be customised to fit a wide variety of lengths that may be needed on a conveyor belt or chute. Contact material handling business development managers for custom opportunities.

Ease of use and convenient installation: affixing multiple QS18 sensors inside one aluminium bar makes installation and alignment easier than working on each sensor individually. Using a single device for this task also means effortless wiring with only one M12 connector to power all the sensors and consolidate the individual outputs into one discrete output.

Heavy duty design and improved stability: the robust aluminium extrusion and sturdy mounting ensure long service life in challenging environments and protects the array bars from impact and vibration. This rugged system resists vibration damage and prevents the sensors from shifting out of alignment. This ensures consistently reliable results.

For more information contact Brandon Topham, RET Automation Controls, +27 11 453 2468, brandon.topham@retautomation.com, www.retautomation.com

---
Legrand’s extensive range of cables and accessories encompasses multimedia cables, which are designed to fit into work areas and in spaces where technology-users need access to power and data connections. These cables are compatible with most desktop PCs, laptops, monitors, scanners and printers, as well as gaming consoles and audio and video equipment.

According to Legrand SA, HDMI is the most popular audio/visual connection for modern-day consumer electronics. The HDMI signal, which is the digital replacement for analog video standards, carries digital audio and visual resolutions and supports ultra HD.

DVI products – cables, adaptors, extenders and splitters – send high definition video from a DVI enabled device to a display, while Cat6 patch cables are used for Ethernet connections. In addition, couplers and cable management products are available for extending the signal and organising a network. DisplayPorts are designed for connecting high definition digital audio/video devices to displays. The company also offers solutions for both analog and digital audio/video signals.

Legrand multimedia cables also include connectors for audio, video and data networks. Audio connectors allow for both analog and digital signals, whilst video connectors are the perfect solution for adding, duplicating or extending a video device. PC connectors make sure a device stays powered and connected to other devices. These connectors adapt with older technology, ensuring all devices work flawlessly. Data connectors are used for Ethernet and Gigabit networks that require fast bandwidth intensive data, or for video distribution applications.

Legrand’s comprehensive range of products and systems for electrical and digital building infrastructures has been designed for easy installation, high efficiency and enhanced aesthetics, whether it be an original installation, extension or reconfiguration.

For more information contact Legrand SA, +27 11 444 7971, legrand.south-africa@legrand.co.za, www.legrand.co.za

Heavy-duty AC and DC contactors

Gigavac’s MX Series extended performance impervious ceramic (EPIC) sealed AC and DC contactors are designed to meet MIL-R-6106 and are especially suited for military vehicles and heavy duty applications. The hermetically sealed chamber ensures that coil, contacts and electronics are shielded from all outside environmental factors. The ceramic to metal weld allows for operation in extreme temperatures up to 200°C. Silver contacts ensure long life and contact weld resistant operation, even in high inrush and overload applications. The dual coil design allows for low power coil operation without the use of EMI generating PWMs.

Options with NO, NC and latching contactors are available, as well as versions with integrated current and/or voltage sensing abilities. Other features include:

• Continuous carry current up to 1000 A.
• Coil voltages 12, 24 and 48 V DC.
• Auto over-current disconnect.
• Current sensing.
• Time delay on break.
• Auto low voltage disconnect.

For more information contact Denver Technical Products, +27 11 626 2023, denvertech@pixie.co.za, www.denver-tech.co.za
<table>
<thead>
<tr>
<th>COMPANY</th>
<th>TELEPHONE</th>
<th>E-MAIL</th>
<th>WEBSITE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABB Measurement &amp; Analytics</td>
<td>+27 10 202 6459</td>
<td><a href="mailto:instrumentation@za.abb.com">instrumentation@za.abb.com</a></td>
<td><a href="http://www.abb.com/measurement">www.abb.com/measurement</a></td>
<td>25*</td>
</tr>
<tr>
<td>Absolute Perspectives</td>
<td>+27 83 274 7180</td>
<td><a href="mailto:gavin@gavinhalse.com">gavin@gavinhalse.com</a></td>
<td><a href="http://www.absoluteperspectives.com">www.absoluteperspectives.com</a></td>
<td>48,49</td>
</tr>
<tr>
<td>Alien Systems &amp; Technologies</td>
<td>+27 11 949 1157</td>
<td><a href="mailto:sales@astafrica.com">sales@astafrica.com</a></td>
<td><a href="http://www.astafrica.com">www.astafrica.com</a></td>
<td>IFC*,72</td>
</tr>
<tr>
<td>Ana-Digi Systems</td>
<td>+27 21 914 9030</td>
<td><a href="mailto:info@anadigi.co.za">info@anadigi.co.za</a></td>
<td><a href="http://www.anadigi.co.za">www.anadigi.co.za</a></td>
<td>9,73*</td>
</tr>
<tr>
<td>ARC Advisory Group</td>
<td>+1 781 471 1141</td>
<td><a href="mailto:pmiller@arcweb.com">pmiller@arcweb.com</a></td>
<td><a href="http://www.arcweb.com">www.arcweb.com</a></td>
<td>46,47</td>
</tr>
<tr>
<td>ASSTech Proc. Elec. + Instr.</td>
<td>+27 11 708 9200</td>
<td><a href="mailto:info@asstech.co.za">info@asstech.co.za</a></td>
<td><a href="http://www.asstech.co.za">www.asstech.co.za</a></td>
<td>37,38</td>
</tr>
<tr>
<td>Automation &amp; Control Solutions</td>
<td>+27 11 249 6700</td>
<td><a href="mailto:rfq@aveng-acs.com">rfq@aveng-acs.com</a></td>
<td><a href="http://www.aveng-acs.com">www.aveng-acs.com</a></td>
<td>45*</td>
</tr>
<tr>
<td>Autonics Corporation</td>
<td>+82 51 519 3232</td>
<td><a href="mailto:sales@autonics.com">sales@autonics.com</a></td>
<td><a href="http://www.autonics.com">www.autonics.com</a></td>
<td>34</td>
</tr>
<tr>
<td>Beckhoff Automation</td>
<td>+27 11 795 2898</td>
<td><a href="mailto:michellem@beckhoff.com">michellem@beckhoff.com</a></td>
<td><a href="http://www.beckhoff.co.za">www.beckhoff.co.za</a></td>
<td>70</td>
</tr>
<tr>
<td>BMG</td>
<td>+27 11 620 7597</td>
<td><a href="mailto:laurenhy@bmgworld.net">laurenhy@bmgworld.net</a></td>
<td><a href="http://www.bmgworld.net">www.bmgworld.net</a></td>
<td>5*,24</td>
</tr>
<tr>
<td>Comtest</td>
<td>+27 10 595 1821</td>
<td><a href="mailto:sales@comtest.co.za">sales@comtest.co.za</a></td>
<td><a href="http://www.comtest.co.za">www.comtest.co.za</a></td>
<td>68,82</td>
</tr>
<tr>
<td>Countuplate Controls</td>
<td>+27 11 615 7556</td>
<td><a href="mailto:bryant@countapulse.co.za">bryant@countapulse.co.za</a></td>
<td><a href="http://www.countapulse.co.za">www.countapulse.co.za</a></td>
<td>75,80</td>
</tr>
<tr>
<td>DEHN Africa</td>
<td>+27 11 704 1487</td>
<td><a href="mailto:hano.eoleofse@dehn-africa.com">hano.eoleofse@dehn-africa.com</a></td>
<td><a href="http://www.dehn-africa.com">www.dehn-africa.com</a></td>
<td>63</td>
</tr>
<tr>
<td>Denver Technical Products</td>
<td>+27 11 626 2023</td>
<td><a href="mailto:denverttech@pixie.co.za">denverttech@pixie.co.za</a></td>
<td><a href="http://www.denvertech.co.za">www.denvertech.co.za</a></td>
<td>84</td>
</tr>
<tr>
<td>ElectroMechanica</td>
<td>+27 11 249 5000</td>
<td><a href="mailto:karenz@em.co.za">karenz@em.co.za</a></td>
<td><a href="http://www.em.co.za">www.em.co.za</a></td>
<td>62</td>
</tr>
<tr>
<td>elonics</td>
<td>+27 31 702 6242</td>
<td><a href="mailto:sales@elonics.co.za">sales@elonics.co.za</a></td>
<td><a href="http://www.elonics.co.za">www.elonics.co.za</a></td>
<td>60*</td>
</tr>
<tr>
<td>Emerson Automation Solutions</td>
<td>+27 11 451 3700</td>
<td><a href="mailto:rob.smith@emerson.com">rob.smith@emerson.com</a></td>
<td><a href="http://www.emerson.com">www.emerson.com</a></td>
<td>44,57,81</td>
</tr>
<tr>
<td>Endress+Hauser</td>
<td>+27 11 262 8000</td>
<td><a href="mailto:info@za.endress.com">info@za.endress.com</a></td>
<td><a href="http://www.za.endress.com">www.za.endress.com</a></td>
<td>65,67*</td>
</tr>
<tr>
<td>Engineering Institute of Technology</td>
<td>+61 89 321 1702</td>
<td><a href="mailto:edwina.ross@eit.edu.au">edwina.ross@eit.edu.au</a></td>
<td><a href="http://www.eit.edu.au">www.eit.edu.au</a></td>
<td>12,loose insert*</td>
</tr>
<tr>
<td>EOH</td>
<td>+27 87 803 9767</td>
<td><a href="mailto:contact@eoh-pas.co.za">contact@eoh-pas.co.za</a></td>
<td><a href="http://www.eoh-pas.co.za">www.eoh-pas.co.za</a></td>
<td>37*</td>
</tr>
<tr>
<td>Gail Norton Instrumentation Agencies</td>
<td>+27 31 701 4861</td>
<td><a href="mailto:telco@telcosa.co.za">telco@telcosa.co.za</a></td>
<td><a href="http://www.gailnortoninstrumentation.co.za">www.gailnortoninstrumentation.co.za</a></td>
<td>32</td>
</tr>
<tr>
<td>GHM Messtechnik SA</td>
<td>+27 11 902 0158</td>
<td><a href="mailto:info@ghm-sa.co.za">info@ghm-sa.co.za</a></td>
<td><a href="http://www.ghm-sa.co.za">www.ghm-sa.co.za</a></td>
<td>33,35*</td>
</tr>
<tr>
<td>Helukabel</td>
<td>+27 11 462 8752</td>
<td><a href="mailto:sales@helukabel.co.za">sales@helukabel.co.za</a></td>
<td><a href="http://www.helukabel.co.za">www.helukabel.co.za</a></td>
<td>63*</td>
</tr>
<tr>
<td>ifm electronic SA</td>
<td>086 143 6772</td>
<td><a href="mailto:info.za@ifm.com">info.za@ifm.com</a></td>
<td><a href="http://www.ifm.com">www.ifm.com</a></td>
<td>39,69*,83</td>
</tr>
<tr>
<td>Instrotech</td>
<td>+27 10 595 1831</td>
<td><a href="mailto:sales@instrotech.co.za">sales@instrotech.co.za</a></td>
<td><a href="http://www.instrotech.co.za">www.instrotech.co.za</a></td>
<td>36,61,66,75*</td>
</tr>
<tr>
<td>Krohne SA</td>
<td>+27 11 314 1391</td>
<td><a href="mailto:d.rampathi@krohne.com">d.rampathi@krohne.com</a></td>
<td><a href="http://www.krohne.com">www.krohne.com</a></td>
<td>36,39*</td>
</tr>
<tr>
<td>Legrand SA</td>
<td>+27 11 444 7971</td>
<td><a href="mailto:legrand.south-africa@legrand.co.za">legrand.south-africa@legrand.co.za</a></td>
<td><a href="http://www.legrand.co.za">www.legrand.co.za</a></td>
<td>84</td>
</tr>
<tr>
<td>Live Monitoring</td>
<td>+27 82 465 9472</td>
<td><a href="mailto:admin@livemonitoring.co.za">admin@livemonitoring.co.za</a></td>
<td><a href="http://www.livemonitoring.co.za">www.livemonitoring.co.za</a></td>
<td>47</td>
</tr>
<tr>
<td>Loadtech Load Cells</td>
<td>+27 12 661 0830</td>
<td><a href="mailto:glen@loadtech.co.za">glen@loadtech.co.za</a></td>
<td><a href="http://www.loadtech.co.za">www.loadtech.co.za</a></td>
<td>81*</td>
</tr>
<tr>
<td>Macsteel Fluid Control</td>
<td>+27 31 581 7800</td>
<td><a href="mailto:kamil.maharaj@macfluid.co.za">kamil.maharaj@macfluid.co.za</a></td>
<td><a href="http://www.macsteel.co.za">www.macsteel.co.za</a></td>
<td>29,31*</td>
</tr>
<tr>
<td>MESA Africa</td>
<td>+27 82 528 1238</td>
<td><a href="mailto:conference@mesa-africa.org">conference@mesa-africa.org</a></td>
<td><a href="http://www.mesa-africa.org">www.mesa-africa.org</a></td>
<td>9*</td>
</tr>
<tr>
<td>Morton Controls</td>
<td>086 100 0939</td>
<td><a href="mailto:sales@mortoncontrols.co.za">sales@mortoncontrols.co.za</a></td>
<td><a href="http://www.mortoncontrols.co.za">www.mortoncontrols.co.za</a></td>
<td>31,34</td>
</tr>
<tr>
<td>Nclose</td>
<td>+27 11 463 0096</td>
<td><a href="mailto:tommy@nclose.com">tommy@nclose.com</a></td>
<td><a href="http://www.nclose.com">www.nclose.com</a></td>
<td>42</td>
</tr>
<tr>
<td>Nicef Industrial Automation</td>
<td>+27 11 462 1740</td>
<td><a href="mailto:info.za@mail.niced.com">info.za@mail.niced.com</a></td>
<td><a href="http://www.nicedautomation.com">www.nicedautomation.com</a></td>
<td>30</td>
</tr>
<tr>
<td>Southern Africa</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Omniflex Remote Monitoring Specialists</td>
<td>+27 31 207 7466</td>
<td><a href="mailto:sales@omniflex.com">sales@omniflex.com</a></td>
<td><a href="http://www.omniflex.com">www.omniflex.com</a></td>
<td>55</td>
</tr>
<tr>
<td>Omron Electronics</td>
<td>+27 11 579 2600</td>
<td><a href="mailto:info.sa@eu.omron.com">info.sa@eu.omron.com</a></td>
<td><a href="http://www.industrial.omron.co.za">www.industrial.omron.co.za</a></td>
<td>7,49,77*</td>
</tr>
<tr>
<td>Parker Hannifin (SA)</td>
<td>+27 11 961 0700</td>
<td><a href="mailto:lisa.debeer@parker.com">lisa.debeer@parker.com</a></td>
<td><a href="http://www.parker.com/za">www.parker.com/za</a></td>
<td>52,53</td>
</tr>
<tr>
<td>Pepperl+Fuchs</td>
<td>+27 87 985 0797</td>
<td><a href="mailto:info@za.pepperl-fuchs.com">info@za.pepperl-fuchs.com</a></td>
<td><a href="http://www.pepperl-fuchs.co.za">www.pepperl-fuchs.co.za</a></td>
<td>80</td>
</tr>
<tr>
<td>Phoenix Contact</td>
<td>+27 11 801 8200</td>
<td><a href="mailto:sbritz@phoenixcontact.co.za">sbritz@phoenixcontact.co.za</a></td>
<td><a href="http://www.phoenixcontact.co.za">www.phoenixcontact.co.za</a></td>
<td>51*,78,82</td>
</tr>
<tr>
<td>R&amp;K Instrumentation</td>
<td>086 111 4217</td>
<td><a href="mailto:info@randci.co.za">info@randci.co.za</a></td>
<td><a href="http://www.randci.co.za">www.randci.co.za</a></td>
<td>38</td>
</tr>
<tr>
<td>RCL Foods</td>
<td>+27 31 242 8595</td>
<td><a href="mailto:hilde.volschenk@rlcfoods.com">hilde.volschenk@rlcfoods.com</a></td>
<td><a href="http://www.rlcfoods.com">www.rlcfoods.com</a></td>
<td>40</td>
</tr>
<tr>
<td>RET Automation Controls</td>
<td>+27 11 453 2468</td>
<td><a href="mailto:brandon.topham@reautomation.com">brandon.topham@reautomation.com</a></td>
<td><a href="http://www.reautomation.com">www.reautomation.com</a></td>
<td>71*,78,83</td>
</tr>
<tr>
<td>RJ Connect</td>
<td>+27 11 781 0777</td>
<td><a href="mailto:info@rjconnect.co.za">info@rjconnect.co.za</a></td>
<td><a href="http://www.rjconnect.co.za">www.rjconnect.co.za</a></td>
<td>54,55</td>
</tr>
<tr>
<td>RS Components SA</td>
<td>+27 11 691 9300</td>
<td><a href="mailto:sales.za@rs-components.com">sales.za@rs-components.com</a></td>
<td><a href="http://www.rscomponents.co.za">www.rscomponents.co.za</a></td>
<td>59,62</td>
</tr>
<tr>
<td>SA Gauge</td>
<td>+27 31 579 2216</td>
<td><a href="mailto:sales@sagauge.com">sales@sagauge.com</a></td>
<td><a href="http://www.sagauge.com">www.sagauge.com</a></td>
<td>3*</td>
</tr>
<tr>
<td>Schneider Electric SA</td>
<td>+27 11 254 6400</td>
<td><a href="mailto:priska.mashanda@schneider-electric.com">priska.mashanda@schneider-electric.com</a></td>
<td><a href="http://www.schneider-electric.co.za">www.schneider-electric.co.za</a></td>
<td>27*,43,58</td>
</tr>
<tr>
<td>SEW-Eurodrive</td>
<td>+27 11 248 7000</td>
<td><a href="mailto:jklut@sew.co.za">jklut@sew.co.za</a></td>
<td><a href="http://www.sew-eurodrive.co.za">www.sew-eurodrive.co.za</a></td>
<td>74,8BC*</td>
</tr>
<tr>
<td>SICK Automation Southern Africa</td>
<td>+27 10 060 0530</td>
<td><a href="mailto:info@sickautomation.co.za">info@sickautomation.co.za</a></td>
<td><a href="http://www.sick.com">www.sick.com</a></td>
<td>64,79*</td>
</tr>
<tr>
<td>Siemens Digital Factory and</td>
<td>+27 11 652 2795</td>
<td><a href="mailto:jennifer.naidoo@siemens.com">jennifer.naidoo@siemens.com</a></td>
<td><a href="http://www.siemens.co.za">www.siemens.co.za</a></td>
<td>OFC*,22,23</td>
</tr>
<tr>
<td>Process Industries and Drives</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Siemens Southern and Eastern Africa</td>
<td>+27 71 492 3789</td>
<td><a href="mailto:keshin.govender@siemens.com">keshin.govender@siemens.com</a></td>
<td><a href="http://www.siemens.co.za">www.siemens.co.za</a></td>
<td>6</td>
</tr>
<tr>
<td>SKF South Africa</td>
<td>+27 11 821 3500</td>
<td><a href="mailto:samantha.joubert@skf.com">samantha.joubert@skf.com</a></td>
<td><a href="http://www.skl.com">www.skl.com</a></td>
<td>56,57,59,66,68</td>
</tr>
<tr>
<td>Technews Publishing</td>
<td>+27 31 764 0593</td>
<td><a href="mailto:jane@technews.co.za">jane@technews.co.za</a></td>
<td><a href="http://www.technews.co.za">www.technews.co.za</a></td>
<td>10*</td>
</tr>
<tr>
<td>Tectra Automation</td>
<td>+27 11 971 9400</td>
<td><a href="mailto:malan.bosman@tectra.co.za">malan.bosman@tectra.co.za</a></td>
<td><a href="http://www.hytecgroup.co.za">www.hytecgroup.co.za</a></td>
<td>76,83</td>
</tr>
<tr>
<td>UIIC Instrumentation</td>
<td>+27 31 468 2561</td>
<td><a href="mailto:guyw@uiic.co.za">guyw@uiic.co.za</a></td>
<td><a href="http://www.uiic.co.za">www.uiic.co.za</a></td>
<td>32</td>
</tr>
<tr>
<td>Veolia Water Technologies South Africa</td>
<td>+27 72 077 7008</td>
<td><a href="mailto:pierre.michallet@veolia.com">pierre.michallet@veolia.com</a></td>
<td><a href="http://www.veoliatwaterotechnologies.co.za">www.veoliatwaterotechnologies.co.za</a></td>
<td>28</td>
</tr>
<tr>
<td>WIKA Instruments</td>
<td>+27 11 621 0000</td>
<td><a href="mailto:sales.za@wika.com">sales.za@wika.com</a></td>
<td><a href="http://www.wika.co.za">www.wika.co.za</a></td>
<td>26,28*,39</td>
</tr>
<tr>
<td>Yokogawa SA</td>
<td>+27 11 831 6300</td>
<td><a href="mailto:christie.cronje@za.yokogawa.com">christie.cronje@za.yokogawa.com</a></td>
<td><a href="http://www.yokogawa.com/za">www.yokogawa.com/za</a></td>
<td>41*,50,51,58,77</td>
</tr>
<tr>
<td>Zest WEG Group Africa</td>
<td>+27 11 723 6000</td>
<td><a href="mailto:info@zestweg.com">info@zestweg.com</a></td>
<td><a href="http://www.zestweg.com">www.zestweg.com</a></td>
<td>60,61*</td>
</tr>
</tbody>
</table>

For more information on these and other suppliers please see www.ibg.co.za

SEW-EURODRIVE supplies an Industrial Gear Unit that offers more efficiency for aeration, mixing and agitating applications with our MC range of Extended Bearing Distance (EBD) Industrial Gear Units.

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

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

SEW-EURODRIVE - Driving the world