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Year after year, pulp mills are subject to the effects of corrosive fluids under extremes of temperature and pressure. Vibration, crystallisation, scaling, and the presence of impurities in the mixture are all conditions under which the plant’s control valves must operate reliably. See this month’s cover story on page 20 for more on the innovative solutions available from NAF.

**Flow control problems in a pulp mill**

- Beckhoff Automation, Rockwell Automation, R&C Instrumentation, Temperature Controls, Parker Hannifin SA, ifm electronic SA, Turck Banner
- IS³ - Industry Software, Solutions and Support, Morton Controls, Gail Norton Instrumentation Agencies, Monitech, AEL Mining Services
- Endress+Hauser, Instrotech, Temperature Controls, ASSTech Process Electronics & Instrumentation, Yokogawa SA, Vepac Electronics
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- Comtest, ifm electronic SA, Siemens Digital Factory and Process Industries and Drives, WIKA Instruments, SKF South Africa, RS Components SA
- Turck Banner, Mimic Group
Valve manufacturers drive new value through IIoT-enabled services

The recent advances in secure cloud-based IIoT platform offerings, along with wireless communication networks, Big Data analytic packages and advanced visualisation technology, has changed all that. But where does one start?

According to the ARC Advisory Group, end users are well advised to develop a phased approach, which includes measurable goals for each step in the process. To avoid getting caught up in the hype surrounding digital technologies, the first step should be to focus on an existing valve-related process problem that is negatively impacting day-to-day operations. Plant owners should begin by identifying their most critical assets that are prone to frequent instability or failure, and deploy feasible monitoring solutions for the valves in those crucial control loops. Severe service valves with their typically higher failure rates offer the most significant potential for cost saving, making them obvious candidates.

The latest generation of valve actuators make extremely accurate position sensing and direct measurement of valve stem travel and thrust possible. This data can be transmitted over a wireless or traditional fieldbus link, and because the information is directly measured and not interpolated, it is an ideal fit for asset management and predictive maintenance planning.

Leveraging the expertise that valve manufacturers have built up over decades just became more reachable than at any time in the past. Industrial facility operators can now have access to actionable control valve health information whenever and wherever they need it. The ARC Advisory Group’s David Clayton has more in the article on page 50.

Steven
Editor: SA Instrumentation & Control
steven@technews.co.za
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The OPC Foundation has welcomed Stefan Hoppe as its next president and executive director. Hoppe is a long-standing member of the control automation industry and the OPC Foundation. As an electrical engineer, he joined Beckhoff in 1995 where he developed OPC classic server and in 2006 the world first OPC UA server integrated into an embedded controller. In 2008 he initiated and chaired the PLCopen OPC UA Companion working group, whose results are adopted in process industries and discrete manufacturing by multiple international well-known vendors. During the following years he became increasingly committed to adopting OPC technologies, seen as a core standard in the emerging Industry 4.0 environment.

After over 12 years of working with and promoting OPC UA, and over eight years of active OPC Foundation leadership, Hoppe was a natural fit for the position. “While the OPC Foundation’s roots come from industrial automation and will always be grounded there, I believe it is time to widen our horizons in multiple directions – inside industrial automation but also into other new markets,” he concluded.

Yokogawa and AlgaEnergy, a Spanish biotechnology company specialising in the production and commercial applications of microalgae, have announced the signing of a strategic partnership and equity participation agreement. The agreement involves an approximately €10 million investment by Yokogawa to acquire newly issued shares of AlgaEnergy. Microalgae are a diverse group of unicellular photosynthetic organisms that can thrive in a wide variety of aquatic habitats, such as oceans, lakes and rivers. Their rapid rate of reproduction means they can be utilised effectively as a biological resource through applications in diverse sectors ranging from agriculture, food and animal feed, through to pharmaceuticals and sustainable biofuels. The entry of Yokogawa as a shareholder will enable AlgaEnergy to reinforce its position of international leadership, with the equity investment being used to fund projects that include international expansion.

ABB has won an order from JG Summit Petrochemical Corporation to supply electrical and process power management systems for its petrochemical expansion project. The project will increase cracker production of ethylene by 50% to 480 000 tpa and propylene by 26% to 240 000 tpa. The new bimodal polyethylene plant will reach a capacity of 250 000 tpa and the capacity of the existing polypropylene plant will be upgraded to 300 000 tpa from current 190 000 tpa. ABB will design, engineer, manufacture, and supply a complete plant electrification system for the proposed expansion. The scope of supply includes high voltage air-insulated switchgear, UniGear medium-voltage switchgear, MNS low-voltage switchgear, power and distribution transformers, a capacitor bank, soft starter, IS-limiters and a process power management system. This software-based solution integrates with ABB Ability 800xA process and electrical control systems to ensure a stable electricity supply.

Don’t miss the February issue which will feature:

- Process variable measurement
- Electrical power & energy-efficient systems
- Wireless & telemetry
- Agriculture, food, beverage & pharmaceutical
- IT in manufacturing (incl. Industry 4.0/IIoT)
- Packaging & bottling
- Control systems (incl. PLCs, DCSs, scada & HMI)
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Skyriders uses drones to complete boiler inspection at Medupi

One of the largest boiler inspections ever undertaken using drones in South Africa was recently completed by Skyriders on Unit 6 at Eskom’s Medupi Power Station. The project was distinguished by its sheer size, with Unit 6 a towering 80 metres high. In addition, a full internal inspection had to be conducted of the entire furnace area, from the bottom all the way up to the super heater elements. This was especially important as it was the first time that the boiler had been inspected thoroughly since start up.

Skyriders’ marketing manager Mike Zinn explains that from the outset the decision was to deploy the company’s proprietary Elios collision-tolerant drone technology. Imported from Switzerland, the hi-tech drone includes a full HD camera, a thermal camera, and an on-board LED lighting system with remotely adjustable intensity. The drone can be brought into inaccessible places up to many hundred metres beyond line of sight due to the wireless communications system and live video feedback. The collision-tolerance feature means it can enter furnace areas easily, and even go right up to a burner for close inspection, without any danger of crashing or causing damage.

The drone was operated by trained pilots, accompanied by a Level 2 boiler inspector, obviating the risk of any staff having to enter the boiler themselves and also making the inspection much quicker to perform. Skyriders opted to use SkyEye technology because it is designed specifically for such arduous conditions. First of all, the boiler was switched off, and subjected to a forced cooling period so that the drone could enter safely. Thereafter, the drone was piloted inside in order to carry out a full boiler inspection.

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

OPC Foundation extends OPC UA including TSN down to field level

The OPC Foundation has announced the launch of its new setup to identify OPC UA and related TSN-harmonisation needs and extends OPC Foundation standards and specifications.

The goal of this initiative is to deliver an open, cohesive approach to implement OPC UA including TSN and associated application profiles. This will advance the OPC Foundation providing vendor independent end-to-end interoperability into field level devices for all relevant industry automation use cases. The OPC Foundation vision of becoming the worldwide industrial interoperability standard is advanced by integrating field devices and the shop floor.

A new set of working groups will identify, manage and standardise the OPC UA relevant topics focused on industrial automation. The working groups will align with the TSN Profile for Industrial Automation (TSN-IA-Profile), which will be standardised by the IEC/IEEE 60802 standardisation group. This will help ensure that a single, converged TSN network approach is maintained so that OPC UA can share one common multi-vendor TSN network infrastructure together with other applications.

This initiative integrates well with existing joint working groups engaged in ongoing companion specification e.g. description of machines.

Stefan Hoppe, President of the OPC Foundation said, “The benefit of membership in the OPC Foundation allows companies to engage and influence the direction of the OPC Foundation and includes early access to the specifications and technology. This initiative will grow OPC UA into new markets and I encourage all OPC Foundation members to contact the OPC Foundation to participate.”

For more information contact Stefan Hoppe, OPC Foundation, stefan.hoppe@opcfoundation.org, www.opcfoundation.org

Elonics celebrates 30 years

Elonics, specialists in industrial automation and connectivity solutions, recently celebrated its 30th birthday. With delicious snacks, tasty ‘Durban curry’, and some ice-cold beverages, key customers were treated to a convivial and chilled afternoon on the premises – a perfect way to end a stressful week.

Managing director Brad Maher said: “The company was founded 30 years ago with a very different focus to what we have today. The knowledge accumulated over the years has given us the experience and expertise to offer our clients the latest up-to-date automation solutions and technologies. With our passionate and dedicated team, clients are guaranteed a professional experience and we are certainly looking forward to the next 30 years together.”

The corporate video can be viewed at: http://www.elonics.co.za

For more information contact Elonics, +27 31 702 6242, sales@elonics.co.za, www.elonics.co.za.
BMG, which acquired FPT Distribution SA (Fenner Power Transmission) over 20 years ago, celebrates Fenner’s 90th anniversary of business in South Africa this year.

“BMG is proud to be the exclusive distributor of the highly-acclaimed Fenner products, all manufactured in South Africa,” says Carlo Beukes, business unit manager, Power Transmission, BMG. “Fenner, founded in the UK in 1861 by JH Fenner, remains a premium brand in power transmission that engineers depend on and trust.

“Fenner power transmission products are synonymous with low maintenance requirements and extended service life, even in the harshest operating conditions. An important factor for BMG is the ‘Fenner Quality Assurance Initiative’, which is a global commitment to excellence. Customers have the assurance, wherever they are located, that the quality of Fenner products always meets exacting, agreed and internationally-recognised industry standards.”

BMG’s Fenner range, which consists of transmission and drive chains, vee and wedge belts, tyre and grid couplings, timing belts, sprockets, pulleys and shaft mounted speed reducers, enables BMG to work with all sectors of industry. The company also services the industrial and mining replacement and resale markets, and is a supplier to original equipment manufacturers.

A strategic decision was made by BMG earlier this year to expand the portfolio through the addition of Fenner conveyor belting products. Through a long-term agreement with Fenner Conveyor Belting, BMG is now the exclusive distributor of Fenner conveyor belting products locally and in sub-Saharan Africa.

BMG, with its technically competent team and well established network of over 130 branches, is well-positioned to develop sales opportunities and provide support for the entire Fenner portfolio.

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

BMG and Fenner celebrate 90 years in SA

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Bernhard Klöss takes the wheel at Endress+Hauser South Africa

By Steven Meyer.

Following the move of Rob Mackenzie to Endress+Hauser’s Swiss-based head office, the company recently announced its choice of Bernhard Klöss as the new managing director of southern African operations. SA Instrumentation and Control had an opportunity to chat to him about the appointment and his plans for the future.

“Can we offer you something to drink?” he asks, settling himself comfortably into a chair at the beginning of our interview. An engaging man with an obvious love for social interaction, Klöss has a long history in the automation industry since his first job as an engineer at Siemens in 1994. Various moves followed, including back to Siemens for a 14-year stint during which he transitioned from engineering to sales to management. Prior to accepting the Endress+Hauser offer, Klöss led the Industrial Automation and Control team at EOH, which included the flourishing Schneider Electric software portfolio of solutions.

Thoughtful in response to the question about why the move from EOH, by his own admission he was extremely happy there, Klöss explains that the more he learnt about Endress+Hauser, the more impressed he became with the company. “The vision and culture suit me perfectly,” as he put it.

“Technology innovation is at the cutting-edge and the work environment supports creative thinking through processes that do away with unnecessary red tape. We also never forget the importance of having a little fun along the way. Endress+Hauser truly is a family organisation.”

As one would suppose, Endress+Hauser’s expectation of its newest regional leader is continued growth and development in sub-Saharan Africa. So what is the strategy?

Put customer problems first

Klöss’ enthusiasm for technology shines through whenever we touch on the subject, but that is not the approach he intends to take in the field. “What customers expect from us are solutions that go beyond just measurement and solve every aspect of their instrument-related problems,” he explains. “So before we think technology, we have to sit down with them and make sure that we understand those problems entirely, and from their unique process perspective. One of the first things I’ll focus on is aligning everyone to the idea that we need to think from an ‘holistic solutions’ perspective for our customers, not individual products or technologies, no matter how cool we think these may be.”

What he is alluding to is that while technology will undoubtedly be the enabler, the choice available today is so wide that one cannot make optimum recommendations without a detailed understanding of each customer’s particular constraints. In addition, the modern trend is for end users to rely on their automation vendors for more than just product supply. Klöss believes that the future lies in strategic partnerships and long-term service level agreements, built on the foundation of one of the most advanced portfolio of process measurement solutions in the business. This is not a particularly new approach, but the connected nature of Industry 4.0 has added an extra complexity.

Digitalisation as the X-factor

I asked Klöss about Endress+Hauser’s approach to digitalisation and how it fits into the argument he has just outlined. “The most important thing to realise is that you are not selling Industry 4.0,” he says disarmingly. “Industry 4.0 is just a platform for connecting people and things to a richer source of information that has never been available before. But if you want it to work for you then you have to deploy it in ways that optimise the customer’s own particular supply chain.”

The trick then is for vendors to understand exactly where and how their equipment can add value in this context. Klöss explains how Endress+Hauser approached it from two directions. First, at the administrative level, there is the W@M portal designed to provide effective management of a plant’s installed base over the entire asset lifecycle. The web-based interface gives plant owners and operators quick access to the information that accelerates processes such as repair or replacement of an instrument, or downloading calibration certificates for inspection. Second, at the edge level, there is the Heartbeat Technology embedded in every new instrument. Designed with predictive maintenance strategies in mind, Heartbeat-enabled instruments run their own diagnostics while in service to ensure process measurements are kept perfectly under control.

“It’s a powerful combination of concepts,” concludes Klöss. I have to agree. Thanks to smart technology, its customers will in the future be able to track their orders through each step of Endress+Hauser’s process, which brings me back to a point Klöss made at the beginning of the interview: “What customers expect from us are solutions that go beyond just measurement to solve every aspect of their instrument-related problems.” It seems like he knows exactly how he is going deliver against this.

For more information contact
Endress+Hauser, +27 11 262 8000,
info@za.endress.com, www.za.endress.com
With the growing scope of the show and changes in the industry, AAF 2019 will again see the inclusion of IoT, Industry 4.0, AI, VR, Robotics, an expanding focus on Cybersecurity and so much more.

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<tr>
<th>4 500 Attendees</th>
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**Connected Industries Conference**

Connected Industries Conference 2019 will again put a spotlight on the Fourth Industrial Revolution and the impact it will have on the South African economy.

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The Manufacturing Enterprise Solutions Association (MESA) recently celebrated the anniversary of its tenth annual conference at the Black Eagle Conference Centre in Ruimsig. This year’s theme was Smart Manufacturing and the Digital Enterprise. Once again, the conference featured a range of high quality speakers, and delegates were able to keep up with the latest developments in the fourth industrial revolution, as well as enjoying great networking opportunities. Sponsors included MESA International, Bytes Systems Integration, AdapIT, the SAIMC and Scheduling Solutions.

Speakers from top companies, such as Sasol, Pepperl+Fuchs, DRA Global, AdapIT, ESTEQ and PwC, covered a range of new technologies and ideas and showed their practical application through interesting case studies. One of the highlights was the presentation by Emma Sadleir from The Digital Law Company, who gave a thought-provoking talk on the legal, reputational and disciplinary risks of social media in South Africa. Other examples included how to compete with multinationals in the warehousing and goods storage business through innovative practices; techniques to optimise the performance of smart manufacturing systems with machines and technologies that can adapt to the market, for example machine tools that can be reconfigured and applied to different industries; implementing an electronic logbook at Thames Water to improve business processes across the entire organisation; a mine operations management system to track inventory, maintenance, production and quality; and the concept of catalytic innovation that is accelerating digitalisation to an exponential level.

For more information contact Daniel Spies, MESA Africa, +27 83 666 6854, chairman@mesa-africa.org, www.mesa-africa.org

Over the past 14 years, since LS split from the LG umbrella, the company has made major strides towards becoming one of the world’s leading technology companies. Today, besides producing the well-known automation and drive products, it also manufactures specialist cables, high voltage DC systems, energy storage systems, power conditioning systems and flexible AC transmission systems, among others. Regarding the automation products, all of the equipment is designed to be compatible with virtually all makes of PLC, HMI, VFD and DCS.

A spate of new automation products is scheduled for release during 2019, which include the WXP computer-based HMI, XGS safety controller, MV soft starters, linear servo motors, planetary gearboxes, Ethercat I/O and the new XEM compact PLC. Ana-Digi Systems, as official distributors for LG / LS products since 1999, is ready for the challenge.

For more information contact Keith, Mornay, Ana-Digi Systems, +27 21 914 9030, info@anadigi.co.za, www.anadigi.co.za
if South Africa is to achieve its ambitions of becoming a manufacturing giant in Africa.”

Annemarie van Coller, president of the SAIMC, says that while automation presents massive economic growth opportunities, it does threaten the current environment’s workforce structure. “If you look at the current ‘triangle of training’, we have a small number of engineers at the apex, and a large number of artisans at the bottom. We need to invert this triangle, and produce a far greater number of engineers capable of supporting automation in future,” she says.

Efforts are now underway to fast-track this process, developing new curricula for automation engineers and introducing new learning models to upskill employees.

SAIMC and other industry stakeholders are moving to introduce a skills development model for the automation sector, based on the successful model introduced in the tooling sector. Driven by Johan Maartens, SAIMC director and COO, the initiative will see the launch of an education and training system for automation personnel modelled on the National Tooling Initiative Programme (NTIP) for the tool and die industry. The launch of the new programme includes the renaming and rebranding of the tooling programme as the National Technologies Implementation Platform (NTIP) under the oversight of the Intsimbi Board. The programme is intended to serve as a fully-fledged 4th Industrial Revolution programme, including training in robotics, mechatronics, and industrial maintenance, and involving over 500 companies.

Launching the new Intsimbi Future Production Technologies Initiative (IFPTI) NTIP’s Centre of Excellence in Cape Town earlier this year, Trade and Industry minister, Rob Davies, said the government was committed to building capacity in response to the impact and opportunities that the 4th Industrial Revolution will bring about.

While funding models and curriculum development are still under discussion, van Coller is optimistic that the new initiative will drive the change the sector needs. “We’re very excited about this, and its potential. It will bring new opportunities for upskilling – gone are the days of being too old, or living too far from a university. This model allows for free, flexible, home-based learning using online tools, along with some facilitator-led learning. Stakeholders are also looking at the necessary infrastructures for participants in rural areas with limited Internet access. It presents the hope that we can develop our own advanced automation skills pipeline and stop relying on imported skills,” she says.

The Connected Industries Conference at Africa Automation Fair 2019 will focus on the challenges, opportunities and economic impact of the Fourth Industrial Revolution (Industry 4.0/IoT) on south sub-Saharan Africa.

For more information contact
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leigh@tradeprojects.co.za,
www.africaautomationfair.com
As we all prepare for 2019 and what it holds, we are standing in front of an open door with access to new opportunities. I would like to take this opportunity to urge you to consider becoming more actively involved in the SAIMC. If you can see that there is an opportunity that you would like to explore, and you have a passion that aligns with the activities we have available within the SAIMC, please consider using this year to get involved.

In order to grow, we need diversity in our thinking. New team members with their own unique skillsets and ideas will add value to the current working groups. And, if you feel that you want to be a part of it, I invite you to make yourself known to the branch that is relevant to you.

As a start you need to be a member of the SAIMC and go to the branch AGM to become part of the team. Committee activities include:

- Arranging technology evenings for our members to learn about technology and to network with their peers.
- Going to tertiary institutions and high schools to talk to students about career opportunities within automation.
- Coordinating the publication of technical papers.
- Arranging site visits to interesting facilities.
- Arranging social events that includes a golf day and year end functions.
- And more...

In 2018 we saw much development in the Industry 4.0 arena and also the NTIP study initiative: teams working tirelessly behind the scenes to take the SAIMC and our strategic initiatives forward. I am looking forward to see what ground-breaking achievements we will see this year.

Vision for the future

In cementing the voice of automation in various economic sectors, governmental institutions and decision making bodies, the following imperatives will always remain core to our operating envelope:

1. Automation engineering accreditation in partnership with ECSA.
2. Drive the discourse on Industry 4.0 with specific focus on governance and policy making in South Africa.
3. Contribute to training and development in partnership with the NTIP and refocusing our collaboration efforts with SETAs.
4. Strengthen relationships with the private sector by means of advisory committee development and implementation.
5. Continue to mobilise and partner with media houses and automation conference bodies (AAF, manufacturing Indaba, etc.) with the aim to sensitise the South African economic sectors to emerging technological developments.

Good luck for 2019 and thank you for being a part of the SAIMC journey, may you achieve all the goals you set out for yourself and live the life that you dream of this year.

Yours in automation
Annemarie van Coller.
Year-end function
It was a cool and pensive night on the Copper Belt in the Zambias. At a quiet well-established lodge, lush with natural flora and fauna, as well as exotic orchid and cycad landscape installations, Sherbourne Lodge is a regular overnight retreat for consultants and other visitors to Kitwe. This was the location of the SAIMC Zambia Annual Banquet.

As the voice of automation and instrumentation, the event was graced by over 45 guests from various mining and technology entities operating in Zambia, namely; Electrical Instrumentation Services, Trescha Electronics & Computer Systems, Neelkanth Cables, Afrilek and Vega. They were joined by various individual SAIMC members, mostly engineers from the mines. Guests were delighted by the presentation of traditional Zambian cuisine such as fresh goat meat from Lufwanyama area, which was heralded by the jovial Tresford Siame, did a fine job as MC for the event.

We were pleased to have the support of SAIMC vice president Pregs Naidoo, who presented a technical analysis of the opportunity for sector growth and development with regard to the theme ‘Automation the key to industrialisation in Zambia’.

The president of the Engineering Institute of Zambia also presented on the same theme from a Zambian perspective, and encouraged all engineers to make their voices heard by ensuring that they are registered with legitimate organisations such as SAIMC Zambia, which can lobby for their interests.

But it was not all technical talk and presentations. In the spirit of the beginning of the start of the holiday season, there was a casual atmosphere filled with progressive music and classical jazz favourites, rounded off by a raffle draw, which saw a guest sauntering off to enjoy a spa and massage, much to the envy of other members.

Technology evening and site visit
On 6 November, Foxboro held a technical presentation for Instrumentation Diploma students at the Northern Technical College, in Ndola. The theme was ‘Internet of Things using wireless devices’. The Foxboro team was led by Johan van Jaarsveldt and included Dewin Sadie and Kobus Vermeulen. In welcoming the Foxboro team, SAIMC Zambia chairman, Enock Shikabeta, expressed happiness at the desire by Foxboro to reach out to the students and share the latest technology trends.

On 20 November, SAIMC Zambia members visited Mpongwe Milling’s plant located in Kitwe. The facility produces mealie meal and flour for the Copperbelt region.
Durban branch

The monthly technology evening was held on 7 November at the Durban Country Club. Verlan Govender of Swagelok gave an interesting presentation on the basics and principles of hoses, to an audience which included a broad spectrum ranging from experienced engineers to students. It is pleasing to see so many students attending these meetings and interacting with people with years of industrial experience.

Verlan’s talk started with a reminder of factors that can influence the life expectancy of hoses, and aspects to consider when selecting them. Construction of various types of hoses was covered, from choice of core tube material and reinforcing layers, through to alternative end connectors, before discussing storage, routing and installation requirements for the various types. He reminded the meeting that the hose core was not the pressure containment element, but that task fell to the reinforcing and covering layers. Industrial hoses are often subjected to all forms of abuse ranging from dragging, tight coils and being driven over, so taking care of the external surface is very important. Some examples of hoses with damaged covers were handed around for inspection and particular attention was drawn to the need to ensure adequate bending radius so that kinking would not occur with the possibility of resultant failure. Other failure modes were also discussed including failure of convoluted metal cores due to vibration.

Choice of a suitable hose for an application was covered by a checklist and the meeting was reminded of the need to perform regular inspections, with the interval being determined by the severity of service. Many questions were asked, all capably answered during Verlan’s talk which was thought provoking and beneficial. The meeting concluded with networking and refreshments to the usual high standard of the Durban Country Club. The branch thanks Swagelok for co-sponsoring the evening.

Secunda branch

The branch had visited the Metso Secunda valve shop on Friday 2 November. Johan van den Heever and the Metso Secunda team gave members a detailed tour of their site and the equipment they use to give their products the necessary support, mainly Metso valves, but also other valves which they are accredited to service and repair.

The technical team uses equipment that caters for the products they need to certify for use on a site like Sasol Synfuels and Sasol Chemical Operations. It was interesting to witness the pressure testing of a valve that had to be released to the Sasol Secunda site. One of the rigs can test for pressure up to 110 bar.

The Metso team have also made adaptations to the current system to cater for larger sizes, which would then also pass the criteria for valve pressure testing. The branch thanks the Metso Secunda team for taking the time to share their knowledge with us.

Tshwane branch

At the November technology evening, Wayne James from Shorrock Automation, presented on the topic of building automation, with a specific focus on lighting management. A copy of the presentation is available for uploading, please contact a committee member for more information.

Please note that the committee has been in discussions with the Johannesburg branch with regard to collaboration next year around golf days, training, etc., as it is anticipated this is a better model than the existing one. We appreciate all suggestions, so also please feel free to share.

In closing for 2018, thanks to all members and patrons for your support this year, have a restful break and come back safe next year.
BECKHOFF

• Automation Engineers

TwinCAT 3 and TwinCAT 2
Durban 5-7 Feb 2019
Johannesburg 12-14 Feb 2019
Port Elizabeth 19-21 Feb 2019
Cape Town 26-28 Feb 2019

For more information contact Andrew Reinhold,
Beckhoff Automation, +27 11 795 2898,
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FESTO

• Mechatronic Engineers
• Maintenance and Repair Staff

PN211 – Electro-Pneumatics
Johannesburg 13-15 Feb 2019

TP101 – Basic Pneumatics
Cape Town 20-22 Feb 2019

HYS11 – Basic Hydraulics
Port Elizabeth 27 Feb – 1 Mar 2019

For more information contact Sammy Kanye,
Festo, +27 11 971 5586, DidacticTaC.za@festo.com,

SIEMENS

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TIA-SERV1 – TIA Portal Service & Maintenance Part 1
Pinetown 18-22 Feb 2019

TIA-SYSUP – Migrate from STEP7 to TIA Portal
Midrand 18-22 Feb 2019

TIA-SERV2 – TIA Portal Service & Maintenance Part 2
Pinetown 25 Feb – 1 Mar 2019

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

MECOSA

• Radiation Protection Officers

Radiation Protection Officers – Training Course on The Use of Radioactive Isotopes for Industrial Measurement
Johannesburg 26-27 Feb 2019

For more information contact
Michelle Ramphal, Mecosa, +27 11 257 6100,
michelle@mecosa.co.za, www.mecosa.co.za

SMC

• Mechatronic Engineers

PNEU0021 – Basic Pneumatics
Johannesburg 20-22 Feb 2019

PNEU0021 – Basic Pneumatics
Durban 27 Feb – 1 Mar 2019

For more information contact Riaan van Eck,
SMC Corporation South Africa,
+27 11 100 5866, rvaneck@smcza.co.za,
www.smcza.co.za

• Automation Engineers

VPEF – Centum VP Essentials
Gauteng 6-8 Feb 2019

Centum – VP Engineering
Gauteng 11-15 Feb 2019

Measuring Principles – PCIMP
Gauteng 11-15 Feb 2019

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Yokogawa South Africa,
+27 11 831 6300,
training@za.yokogawa.com,
www.yokogawa.com/za

Endress+Hauser

• Instrument Technicians and Engineers

TC1001 – Process Measurement and Instrument Configuration 1
Gauteng 11-15 Feb 2019

TC1002 – Process Measurement and Instrument Configuration 2
Gauteng 18-21 Feb 2019

TC1003 – Process Measurement and Instrument Configuration 1 & 2
Gauteng 11-21 Feb 2019

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

YOKOGAWA

TwinCAT 3 and TwinCAT 2
Durban 5-7 Feb 2019
Johannesburg 12-14 Feb 2019
Port Elizabeth 19-21 Feb 2019
Cape Town 26-28 Feb 2019

For more information contact Andrew Reinhold,
Beckhoff Automation, +27 11 795 2898,
training@beckhoff.co.za,
http://www.beckhoff.co.za/training/
## System Integrators

<table>
<thead>
<tr>
<th>System Integrator</th>
<th>Description</th>
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<tr>
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<td>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 <a href="mailto:sales@abacus-automation.co.za">sales@abacus-automation.co.za</a> <a href="http://www.abacus-automation.co.za">www.abacus-automation.co.za</a></td>
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<td><strong>Afrilek</strong></td>
<td>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 <a href="mailto:sales@afrilek.com">sales@afrilek.com</a> <a href="http://www.afrilek.com">www.afrilek.com</a></td>
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<td><strong>Altech Alcom Matomo</strong></td>
<td>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 <a href="mailto:nwatermeyer@alcom.co.za">nwatermeyer@alcom.co.za</a> <a href="http://www.alcommatomo.co.za">www.alcommatomo.co.za</a></td>
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<tr>
<td><strong>Autotronix</strong></td>
<td>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 <a href="mailto:sales@autotronix.co.za">sales@autotronix.co.za</a> <a href="http://www.autotronix.co.za">www.autotronix.co.za</a></td>
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<td>Customer-centricity allows CSS to attain a high percentage of repeat business from its growing customer base. With a solid 16 years' experience in designing customised C&amp;A solutions, CSS partners with customers in relationships thriving on information sharing and open communication enabling them to enhance customer operations. Supplier Certification provides customers with the assurance that the CSS team is completely up to date on current trends and technology as indicated by a number of prestigious awards. Tel: +27 31 914 0040 <a href="mailto:pieterv@cs-solutions.co.za">pieterv@cs-solutions.co.za</a> <a href="http://www.cs-solutions.co.za">www.cs-solutions.co.za</a></td>
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<tr>
<td><strong>Hybrid Automation</strong></td>
<td>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 <a href="mailto:info@hybridautomation.co.za">info@hybridautomation.co.za</a> <a href="http://www.hybridautomation.co.za">www.hybridautomation.co.za</a></td>
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<tr>
<td><strong>Iritron</strong></td>
<td>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 <a href="mailto:alwyn.rautenbach@iritron.co.za">alwyn.rautenbach@iritron.co.za</a> <a href="http://www.iritron.co.za">www.iritron.co.za</a></td>
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<td>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 <a href="mailto:info@moore.co.za">info@moore.co.za</a> <a href="http://www.moore.co.za">www.moore.co.za</a></td>
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** SYS TEM INTEGRATORS **

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** Iritron **

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** Hybrid Automation **

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** Moore Process Controls **

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** Afrilek **

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** Abacus Automation **

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** Altech Alcom Matomo **

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** Control Software Solutions - CSS **

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** Autotronix **

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** Hydrid Automation **

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** Iritron **

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** Hybrid Automation **

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** Moore Process Controls **

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Process Dynamics

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

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www.process-dynamics.co.za

SAM – Systems Automation and Management

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

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Tel: +27 71 658 1553
paul@psy-intl.com
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paul@psy-intl.com
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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.

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www.instrumentation.co.za  January 2019  17
KVM Tech focuses on product excellence and superior support

The intellectual property of KVM Tech was acquired by Alwyn Rautenbach in 2010 and a short while later current MD, Reghardt Rautenbach, joined the company. The intervening years have seen the company grow with 10 engineers/technicians now employed within the Somerset West, Pretoria and Port Elizabeth branches. Reghardt Rautenbach says that the company has developed a niche for its KVM (keyboard, video, mouse) systems for various control rooms within southern Africa. These systems, which are characterised by their ability to integrate with other business and productivity platforms, are customised to match specific needs and applications. The KVM solutions are essential for mission critical environments that depend on complete reliability and uptime.

“Since our products are renowned for their longevity, we believe it is important to equip clients with the ability to self-maintain them for the long term,” he adds. “By transferring our knowledge to the client, we provide them with all the tools they will need to create sustainability within the control room environment.”

KVM Tech supplies both high-end and entry level KVM solutions. Founded 30 years ago, Guntermann and Drunck has built a reputation as a manufacturer of sophisticated enterprise-level KVM systems for broadcasting, air traffic control, industry and maritime industries around the globe. KVM Tech is the exclusive distributor for the company in southern Africa.

Recognising the need for KVM systems for the more cost-conscious client, Rautenbach visited kvm-tec electronic in Austria and returned with an exclusive dealership agreement to distribute for the company’s product range in southern Africa.

“We have a very strong footprint in southern Africa with both product ranges, having installations in all the air traffic control towers in the country as well as in Multichoice’s command centre, and a number of other broadcasting centres,” says Rautenbach. “We have also installed a system at NCP Chlorchem’s chlorine manufacturing plant in Kempton Park. This ongoing project involves the removal of all current PCs from the corrosive working environment and the addition of new KVM products.”

Eurotherm agency
As a result of a long-standing working relationship, Iritron was asked by Eurotherm UK in late 2017 to assist the company in finding a solutions provider who could comprehensively support the product and not just move boxes. KVM Tech was subsequently approached by Iritron in mid-2018 and a collaborative relationship developed to provide a complete Eurotherm solution.

Rautenbach says that the relationship is synergistic and provides the local customer base with a complete automation design, engineering and support base. Iritron will conduct all engineering and panel building will be undertaken by Referro.

Eurotherm’s lead trainer in the UK spent a number of days training KVM Tech and Iritron engineers at KVM Tech’s local premises. In addition, a number of Eurotherm’s key clients in South Africa received hands-on training.

“We are excited about growing the presence of the Eurotherm brand in southern Africa,” concludes Rautenbach. “It is a stable and reliable product range, and with a dedicated engineering and support complement in South Africa, we believe it will go from strength to strength.”

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

KVM Solutions

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

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

Eurotherm Solutions

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

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

From professionals to professionals
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Contact us on info@kvmtech.co.za or +27 21 855 1622 | www.kvmtech.co.za
Flow control problems in a pulp mill

NAF’s advanced process valves solve pulp, paper and cellulose applications.

24 hours a day, month after month, year after year, pulp, paper and cellulose mills are subject to the effects of corrosive and erosive fluids under extremes of temperature and pressure. Vibration, crystallisation, scaling, and the presence of impurities such as sand or metal in the mixture are all conditions under which the plant’s control valves must operate – and operate reliably.

Valve & Automation’s selection of NAF process valves have been designed to cope with and exceed even the harshest demands of such severe industry applications. However, to ensure long life and trouble-free operation, it is essential that all valves are chosen carefully to suit the application where they will be installed. With a history of 30 years’ experience in the pulp and cellulose industry, Valve & Automation, together with long-standing partner NAF in Sweden, are well placed to guide plant owners through every step of this crucial selection process. The company’s managing director, Ron Nel, explains that over the years the team has acquired industry-related experience from valve selection according to application, through commissioning, to frame agreements for deliveries staggered over the duration of a project. With over 25 000 valves already supplied to local producers Sappi & Mondi, Valve & Automation offers a service to control the issuing of valves during a project through managing its customer’s valves store, as done on the Sappi GoCell project where over 4 500 valves were supplied. Assisted by its principal NAF – with more than 100 years’ experience in pulp, paper and cellulose projects – the company is fully qualified to support end users with valve supply and technical advice from design stage through to commissioning, and will remain there to support maintenance staff when they take over.

Brief overview of the chemical pulp process

The Eldorado Cellulose facility in Três Lagoas marries efficiency, achieved through shrewd deployment of state-of-the-art technology, and sustainability, achieved through raw materials fed from its nearby eucalyptus forests – a 100% renewable source.

Cooking

After the trees have been debarked and cut into chips, the next production step involves cooking the wood in chemicals. The mixture is heated under pressure to 130-170°C and held at that temperature for a period of time. The combination of heat and chemicals dissolves the lignin and separates the wood into cellulose fibres. Then the pressure and temperature are lowered and the pulp is blown or washed out of the digester.

Washing and screening

The washing process is designed to separate the spent cooking liquid containing chemicals and dissolved wood substances – black liquor – from the pulp fibres as efficiently as possible, and with minimum of dilution of the liquor. It takes place in the high heat washing zone of the digester and involves various equipment such as filters, diffusers, belt washers and
presses. The recovered black liquor can then be burned to produce energy that is fed back into the process.

The screening system is designed to remove uncooked chips, large knots, fibre bundles, sand and stones. The screening system ‘rejects’ are fed to a secondary screen, while the ‘accepts’ are recirculated. The knots from the secondary screen are then sent back to the digester for another round of cooking.

**Correct valve selection is essential**

Due to their dynamic nature, the processes described depend on the reliable operation of control and shut-off valves to achieve maximum efficiency. Control of the fluid flows in the Eldorado mill is achieved through the €13 million investment in a total of 1584 NAF control valves of the Duball, Setball and Torex ranges. Final selection was made after extensive collaboration between NAF experts and plant designers to ensure every choice in this trailblazing project was rigorously considered and understood.

**NAF-Duball**

The NAF-Duball DL is the latest addition to the range of high-performance rotary control valves. It is a full-bore ball valve, targeting the need for automated ball valves in harsh processes such as those in the pulp, paper, cellulose as well as chemical industries. The excellent characteristics with a wide range of materials are particularly beneficial under tough operating conditions where difficult media and extreme pressures stress the design, materials and performance – 553 were supplied for the mega project.

**NAF-Setball**

This ball sector valve with metal-to-metal seating combines the best control features of the ball and butterfly valve. It can be used both as a control and as a shut-off valve, and has an enlarged outlet with one size bigger flange to achieve optimal flow characteristics in pulp and slurry applications.

The NAF Setball SF is ideal for any application involving particles, fibres or slurries. The high flow capability in combination with its compact size makes it a viable and economic alternative to linear control valves – 665 were supplied for the project.

**NAF-Torex**

The NAF-Torex high-performance butterfly valve is available with either metal-to-metal or soft seats. A unique design and triple offset ensure particularly tight closure. It can be used both as a control and as a shut-off valve, supplied in either wafer or lugged versions in a variety of materials including carbon, steel, titanium and stainless steel.

The rugged design and excellent characteristics are particularly beneficial in control applications involving difficult media and demanding pressure conditions – 366 were supplied for the project.

**Suppliers can no longer just be vendors on projects this ambitious**

The massive scale of the Eldorado Cellulose project (2.5 billion) made the plant owners dependent on the multitude of vendors for more than just the supply of equipment. Given the size of the plant and the diversity of the processes it became essential that suppliers contributed in a technical capacity as well. Considering the valves alone, and given the variety available in the market, it became imperative that the industry experts at NAF moulded themselves into the design team.

Nel confirms that the choices available today often make it difficult for designers to identify the option that best fits their unique situation. The implication is that in order to add maximum value, vendors have a responsibility to support their customers through all phases of a project’s lifecycle – from plant design to equipment disposal.

"Knowledgeable, experienced suppliers have become primary to the success of most modern projects," says Nel. "The value added through product and process insight often means the difference between completion on time and on budget or missed deadlines and overspend."

Eldorado Cellulose’s autonomous mill mega project serves as an example of the value that can be achieved when state-of-the-art technology and an environmentally conscious attitude are combined. Good design decisions and intelligent use of automation provide the platform, but the support of suppliers with the urgency to understand that technology on its own is no longer enough to provide the glue that welds everything together. When it comes to flow control solutions in pulp and paper applications, valve expert NAF is just such a supplier. Smaller industry-related projects could benefit from the formula as well.

*For more information contact Gareth Taylor, Valve & Automation, +27 31 579 2593,*  *sales@valve.co.za, www.valve.co.za*
For more than 25 years, Scheugenpflug AG, based in Neustadt, Germany, has created machines and production lines for dispensing and metering equipment used in the automotive industry. High-end-automation – with PC-based control and CNC technology from Beckhoff – enables finely-tuned processes and production results with high repeat accuracy.

A recent example is a production line deployed for an automotive industry supplier that makes heaters for hybrid and electric vehicles. Ulrich Böhm, team leader of development control and drive technology at Scheugenpflug, explains: “In contrast to combustion engines, electric motors don’t generate heat that can be used for warming the passenger compartment, which means an electric heater is needed.”

**Compact rotary indexing system for complex processes**
The heater production line includes a rotary dispensing system, whose key elements include a loading station with sensors and a scanner, a plasma treatment station, the metering system and two further stations for joining and fastening the electronics housings. Scheugenpflug COO, Johann Gerneth, illustrates the specific benefits of the system: “We demonstrated that the complex, high-precision dispensing process can not only be realised as a conventional in-line solution, but also as a highly-compact rotary indexing system. A prerequisite for this was the application of high-performance, modular and flexible control technology from Beckhoff.”

Rainer Bröckl, team leader of mechanical engineering, describes the process sequence. “Three different dispensing materials are introduced into the workpiece as it passes through the rotary indexing system three
times. In other words, the dosing system applies sealing material at three different production stages and at different points. Before the sealing material is applied, the workpiece is subjected to plasma treatment, which involves cleaning and activation of the housing material to ensure the best-possible adhesion. In the joining station, the components are then assembled and secured with screw connections. Since all these sub-processes are interdependent, a rotary indexing system represents the ideal solution.

Open control technology: the ideal basis for modular machine design
As specialists for customer-specific production machines and systems, Scheugenpflug is able to meet wide-ranging customer demands, especially in terms of automation technology. Gerneth explains: “A crucial factor for us was that we support a modular and customisable control platform from one source, enabling us to meet as many customer requirements as possible. This was the only way we could develop the advanced machinery we have today. Modularity – in our electrical, mechanical and software components – was a prerequisite for our successful development from a small, special-purpose machine manufacturer into a comprehensive solution provider using modular product architectures.”

Böhm added: “We were particularly impressed by the openness of the PC-based control technology from Beckhoff and the company’s ongoing development and innovation. A good example is the high-performance drive technology, which enables us to integrate advanced servomotors in our machines. We generate substantial benefits from the engineering and design of One Cable Technology (OCT) here because OCT and the compact motors themselves help save valuable installation space. Moreover, a wide performance range is available for different requirements. In addition to AM8023 servomotors, we use the AM8533 version with increased rotor moment of inertia in the new dispensing system.”

CNC solution seamlessly integrated into standard control technology
TwinCAT CNC software ensures high-precision motion control in the dispensing system. Böhm describes the benefits of this CNC solution, which is seamlessly integrated into standard PC-based control technology: “In addition to system continuity, the PC-based CNC offers further advantages. On the one hand, it is very fast and efficient. On the other hand, we benefit immensely from the openness and flexibility of the CNC for functional extensions, which helps us achieve optimum application-specific functionality. Further benefits offered by TwinCAT include the powerful high-level interface (HLI) between the CNC kernel and the PLC, as well as the customisable parameter interface. The CNC parameter sets can be generated directly from the PLC project, enabling quick and flexible response to different requirements. In this way, the functionalities commonly requested by customers can simply be mapped as software modules, facilitating a high degree of parametrisation and more efficient software development.

“We use TwinCAT CNC to control measurement runs, for referencing and for user-specific functions, such as stop, hold and end of program run, for example. Additional features include transformations and a fifth motion axis, which relates to the tool or the dispensing needle itself, to apply the sealing material to sloping surfaces, for example. In addition to the functionality of a conventional 3-axis kinematic system, it enables rotation of either the complete tool or just the dispensing needle. The same principle applies to the plasma station, where just a different tool is used.”

The Beckhoff C6920 Industrial PC forms the core of the control system. Together with five two-channel Aservo drives and two single-channel Aunits – each equipped with a TwinSAFE card – it provides 12 dynamic and precisely-positioned servo axes via the servomotors. A total of 21 EtherCAT Terminals, 15 TwinSAFE Terminals, 21 EtherCAT Box modules and a TwinSAFE-EtherCAT Box provide comprehensive data acquisition and safety functionality.

In addition, the dispensing system offers a high degree of ergonomics for machine operators. Three CP3915 multi-touch control panels ensure that machine operators have access to all required information at any time from any angle. A 3-D visualisation of the dispensing contour can be used to check the results of the G-code programming before starting the actual dispensing process.

High-performance, open data communication
For Böhm, EtherCAT plays a key role in the control technology for several reasons: “EtherCAT has become established as a global standard, supported by numerous third-party suppliers. Moreover, the installation and electrical connections are straightforward. Another important factor is that the data transmission rates are very high, so we don’t have to worry about bandwidth capacity limits. A further benefit is the XFC technology, used for fast and precise tool measurement via the EtherCAT Box with two-channel timestamping function.”

According to Gerneth, the openness of the PC-based control technology and its communication capabilities are also central aspects from an Industry 4.0 perspective: “Our machines, with PC-based control technology, offer a high degree of flexibility and openness for interfacing with MES and ERP systems through the use of ADS, TCP/IP or OPC-UA communication, based on customer requirements. To enable traceability, universal communication is particularly critical in the automotive industry, and will become even more important in the context of Industry 4.0.”

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

www.instrumentation.co.za January 2019 23

AUTOMOTIVE
Kia Motors Corporation (KMC) was founded in 1944 and today, as part of the Hyundai-Kia Automotive Group, it aims to become one of the world’s premier automotive brands. To increase market share not only in Europe, but also globally, KMC built its first-ever European facility in Zilina, Slovakia, which started production with a capacity of 300,000 units per year.

The challenge
As in most automotive companies, optimised manufacturing processes have become more important than ever before. To maximise efficiency and productivity, KMS required an integrated solution where information and devices are connected seamlessly to each other.

The Body Shop was operating with CompactLogix connected with ControlLogix and its Body Complete (BC) line was assembling all moving parts through manual handling by 20 workers. However, frequent breakdowns not only decreased productivity, but sometimes stopped the entire production line.

The BC line was configured with safety relays and was guarded with safety scanners and relays. The safety relays had complicated wiring and long conductor routing from the safety device to the relay in the main cabinet, without having a by-pass function from the scanners.

The safety circuits caused many line stops and it was often difficult to identify the reason or the location of the failure, while also taking a long time to repair. Future line stops were always anticipated due to the long and complicated safety wiring circuits.

Relay-based safety controls have a long history of helping prevent hazardous encounters between worker and machine. Safety devices such as scanners and emergency stop push-buttons connected by safety relays, have traditionally been the method of choice to protect machine operators.

But relays can offer limited fault diagnostics and are difficult to adapt as applications change because of the hardwiring they require. For these reasons, and considering the critical situation, an alternative integrated safety solution offering status visualisation and higher reliability and flexibility than the incumbent relay system was required by KMS.

The solution
Seeking a solution to meet its needs for an integrated safety solution with visualisation and increased reliability, KMS turned to Rockwell Automation – a trusted supplier for many of its production operations.

Rockwell Automation proposed a safety system that comprised safety-related programmable controllers and a network. Safety controllers, instead of traditional safety relays, help customers to create both lean and quick adaptable manufacturing processes that keep operators safe. The Allen-Bradley GuardLogix safety controller, which expands on standard Allen-Bradley ControlLogix processors with safety firmware and a safety processor was offered. Remote safety I/O modules were added and connected to the EtherNet/IP network and visualisation of safety conditions, alarms, emergency events and programming of control system and visualisation was developed for the existing Allen-Bradley PanelView Plus panel.

Allen-Bradley GuardLogix brings together the benefit of a Logix platform – common programming environment, common networks and common control engine – with integrated safety control in an easy-to-use platform, while providing SIL 3 control. By deploying Allen-Bradley ControlLogix processor, GuardLogix users can benefit from common programming software, controller and I/O to help reduce development time and application cost.

With the new design, the line was divided into five zones. Each zone had a cabinet with Safety Point I/O and only 2–3 m of wiring. Each Safety Point I/O was connected to Allen-Bradley GuardLogix with EtherNet I/P using RSLogix 5000. Each scanner had a bypass function with the possibility of light signalling and switching. Now, when the line is interrupted, only the relevant zone is stopped, signalling the location. The operator can also easily communicate with each zone through EtherNet I/P, allowing the failure to be easily identified and quickly recovered, while other zones remain operational.

Results
KMS considers the Rockwell Automation solution a complete success. By converting to a Safety PLC from a relay-based solution, it now has a flexible line with excellent reliability, which reduces maintenance and troubleshooting, while helping to secure safety as required. KMS now plans to expand and apply the integrated safety concept to other lines in the body and press shops.

For more information contact Michelle Junius, Rockwell Automation Sub-Saharan Africa, +27 11 654 9700, mjunius@ra.rockwell.com, www.rockwellautomation.co.za
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For successful paint cure, irrespective of the paint chemistry being used, it is critical to measure and control the temperature of the car body as it travels through the oven. Today, paint ovens are controlled in a sophisticated fashion via thermocouples located in each zone to give constant feedback on the ambient temperature. Although this temperature data is helpful as it gives an idea of process control from an oven perspective, it does not tell the whole story. To cure the paint to specification (cure schedule), the critical information required is the peak metal temperature and the time that peak metal temperature is maintained. The control thermocouples in the oven cannot provide this data.

**Oven temperature profiling**

It has been established that oven temperature profiling is the only accurate method by which the oven process can be monitored to ensure that the paint cure schedule has been correctly achieved. The oven profiling system is designed in such a way that it is able to travel with the car body through the cure oven, measuring the product temperature continuously at selected locations on the car body. At the end of the process, the collected temperature readings create a thermal profile of the product from which the cure schedule can be measured and validated.

**Oven Tracker XL2**

Two of the biggest challenges of oven profiling in an automotive paint shop are the sheer scale of the operation and the time it takes to transfer equipment to and from the QA office to the paint line requiring testing. The Datapaq Oven Tracker XL2 has been developed with key features that allow sequential testing of multiple ovens without the need to download profile data between runs. The XL2 logger can be programmed to perform multiple runs (up to 10), so that each oven can be tested and its data stored separately in the memory of the data logger.

Complementing the multiple run operation mode, the user can employ a unique feature called SmartPaq. Prior to the run, the user can program the logger with critical target performance criteria (maximum temperature limit, time at temperature target or acceptable Datapaq value range). The data collected by the data logger is analysed against these criteria at the end of the run and the logger indicates whether the criteria have been achieved or not. The SmartPaq feature makes profile qualification as easy as checking for a green Pass LED, which means the user can move on to the next oven with confidence and without any need to download data. The data can be analysed in full later after all runs are completed. If the LED is red, then there has been a process problem. Knowing this as soon as possible is critical to reducing rework, since the root cause of the problem can be identified much earlier in the process.

Datapaq has worked with key automotive manufacturers to develop a barrier technology that allows not just one or two ovens to be tested sequentially, but the complete paint operation from start to finish in one single run. This single pass method is used with a test car, allowing the system to be installed off line.

Datapaq has even developed a special thermocouple that has high temperature magnets that ensure the sensor stays attached to the car body and also does not damage the painted surface. Also, the software can be personalised to show a picture of the car under test, along with a pictorial representation of thermocouple locations on the car.

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

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**Control in paint shop applications**

A logical combination of heating method and control is radiant heat with an Exergen IRt/c for control. The combination works well together since both the heating and measuring occur right at the surface where the paint is located. The Exergen IRt/c reading is unaffected by reflections from the heater, since the spectral response of the 6-14 micron IRt/c lens filters out the shorter wavelengths of the radiant heater energy.

The sensor may be mounted in the shroud or reflector of the radiant heater, such that it can see through the elements. Select any of the Exergen IRt/c models, depending on the field-of-view required to see past the elements to the painted surface. Test the location by turning on the heater with no target present. The change in reading should be small. Care should be taken in mounting to keep its temperature below 93°C and to keep the lens clean. The IRt/c.3x, .5, and .10 are the preferred models for this application because of their built-in air purge. They can be used in environments with temperatures up to 121°C or higher when the air purge system is used. The narrow fields-of-view allow more leeway in positioning, and thus more flexibility in installation.

For more information contact Temperature Controls, +27 11 791 6000, sales@tempcon.co.za, www.tempcon.co.za
Global partnerships for automotive support

Parker Hannifin is a global leader in motion control components and system solutions serving industrial, mobile and automotive markets. Specialising in hydraulics, pneumatics, electromechanics, fluid connection and filtration, the company can act as a single source for all automotive market requirements. Customers rely on Parker’s proven multi-technology systems, engineering excellence, world class manufacturing and customer service to provide comprehensive application solutions and reduce manufacturing time and total cost of ownership.

Parker is committed to helping customers become more productive and more profitable through its global offerings of motion and control products and systems. In an increasingly competitive global economy, the company seeks to develop customer relationships through technology partnerships. Working closely with customers, it can ensure the best selection of technologies to suit the needs of their applications.

Parker solutions
Among the challenges in automotive manufacturing is how to achieve globalisation in order to address growing markets. Another is to improve efficiencies in TAKT time – the rate at which a finished product needs to be completed in order to meet customer demand – in order to increase overall productivity.

Parker’s global footprint ensures localised product and service, with more than 300 global factories and 13 000 distribution network locations. Its machine schematic review process ensures that the most efficient systems are provided to customers. Programme management services address a process in order to commoditise the products used on a programme and make recommendations for the ongoing management of spare parts inventory. In addition Parker field sales and distribution representatives are present on the plant floor, addressing system diagnostics, product functionality and product lead time to ensure manufacturing productivity.

Here are some of the key products that Parker supplies to the automotive industry:

Leak free weld water solutions
Parker’s actuators and accessories for welding robots prevent water expulsion. Their integrated design allows for dry weld tip changes and keeps water off equipment and out of the production cell. Paired with the Water Saver, the Water Retract Actuator (WRA) prevents weld water expulsion from the robot during tip changes, keeps water off equipment and electronics within the cell, and reduces water consumption costs and the need for expensive chemical additives.

Die cast hydraulic system with Parker Eco Drive system
There are many benefits to using a Parker Eco Drive system. Designed with closed loop pressure control, it will increase die casting speed. Piston speed ranges from 0,05 to 10 ms, with a maximum acceleration of 500 m/s, and a pressure increase from 160 to 300 bar in 50 ms.

Transair solutions
Transair piping systems were designed to avoid the issues created by traditional systems. Benefits of using Transair include corrosion resistance, immediate pressurisation and provision of clean air, together with a leak-free guarantee.

Compressor room filtration
In the compressor room, Parker offers many products to filter and condition dry air before it is distributed throughout the plant. Parker can even carry the controlled air to a customer’s specific requirement through an integrated supply system. The company can assist with most applications across a full range of sizes.

Filtration
Parker filters protect customer equipment, resulting in quality finished products, together with reduced downtime and lower costs. Portable filter carts are the ideal way to pre-filter and transfer fluids into reservoirs or to clean up existing systems. Using a Parker portable filter cart is the most economical way to protect a system from damage caused by contamination. In addition, point of use desiccant dryers are the simplest and most reliable method of ensuring that sensitive pneumatic equipment is not exposed to damaging moisture.

Fluid condition monitoring
With 15 years’ experience in manufacturing the world’s bestselling white light portable particle counter, the CM20, the progression to the LaserCM with its opto-mechanical, continuous wave SPSL single point source laser is both a natural and customer driven development.

For more information contact Lisa de Beer, Parker Hannifin SA, +27 11 961 0700, lisa.debeer@parker.com, www.parker.com/za
To avoid collisions during manoeuvring, ifm electronic offers an automatic collision avoidance system: a 3D camera mounted at the back of a vehicle monitors the rear area, detects objects in the travel path and warns the driver of possible collision.

**Automatic collision avoidance**
Active protection is provided by ifm’s O3M camera: the integrated 3D sensor not only displays obstacles behind the vehicle on a screen in the cockpit, but also determines the obstacle’s size, position and movement. Based on this detection of the environment and the mobile machine’s own movement, the O3M system assesses the critical relevance of objects. It warns the driver of obstacles that are either in the path, or on a collision course. This prevents the driver being overwhelmed by warnings of objects in noncritical areas. Another advantage of the intelligent O3M system is that if a vehicle moves into the travel path from the side, the risk is detected faster than with a distance-based warning.

**Camera image with overlaid 3D objects**
The O3M system has two integrated cameras: a conventional 2D camera and a 3D version that determines the exact distance to each pixel. The advantage for the user is that critical obstacles can be highlighted, for example in red, with less critical objects in yellow or green. Furthermore, an additional warning symbol can be provided in this case. This overlay is completely generated in the O3M, so neither additional hardware nor complex programming is needed. Visualisation can easily be adapted to the application conditions with the ifm Vision Assistant software (colour, symbols, language, etc.)

**Graded warnings**
Parallel to the visual representation, a warning is transmitted to the CAN bus, which is used to produce an additional acoustic signal or even to intervene with braking. This reaction can be graded depending on the distance to the obstacle, i.e. at first an acoustic and visual warning is given. If the driver does not react and the situation becomes more serious, the vehicle can be slowed.

**Image capture methodology**
The integrated PMD 3D chip from ifm detects scenes and objects three-dimensionally with only one image capture. This avoids the motion blur that can occur with line scanners. This then forms the basis for a sensor system that can cope with the harsh operating conditions of mobile machines. Besides the robust and compact design, the O3M sensor system is specially constructed for outdoor applications with changing light conditions, or bright sunlight. The sensor has no moving components in contrast to other sensors, such as laser scanners, therefore, it is particularly robust and not subject to wear. The operating principle of the PMD technology is based on the time-of-flight principle. The scene is illuminated by modulated, invisible infrared light and the reflected light hits the PMD sensor, which is also connected to the source of the modulation. Each pixel of the chip then determines the distances to the scene using the phase shift between the transmitted and received signals. The integrated, active suppression of background illumination almost completely prevents saturation of the sensor by extraneous light. That means that it can be operated in bright sunlight up to 120 klx. The integrated 2 x 32-bit processor architecture ensures rapid and reliable calculation of the 3D data directly in the system at up to 30 images per second.

**Smart functions**
The mobile 3D smart sensors feature some integrated evaluation functions, which besides the collision avoidance described here, enable a multitude of other applications to be solved, e.g. line guidance or area monitoring. A highly developed algorithm from the automotive industry is used, ensuring reliable automatic object recognition of up to 20 objects. In just a few steps the parameters of the system are set via the easy-to-use Vision Assistant for Windows. To do so, the user only needs to enter some parameters, e.g. regarding the vehicle’s geometry, which only takes a few minutes before the system is ready for operation.

**Communication interfaces**
The pre-processed function data is output via the CAN bus using CANopen or SAE J 1939. If needed, the complete 3D information can be processed via Ethernet UDP and an external process unit to provide developers with an open system. For more information contact ifm electronic SA, 086 143 6772, info.za@ifm.com, www.ifm.com
IO-Link wired exhaust system production

Turck demonstrates the flexibility of its BL20 multiprotocol gateway in conjunction with the IO-Link-capable TBIL hubs.

System integrator, Teknodrom Robotik ve Otomasyon, has implemented a production line in Turkey for one of the leading manufacturers of exhaust systems. The challenge in the project was to provide the required level of flexibility for the line, which needed a variable, robust and EMI resistant automation technology due to the welding applications in place. In its search for a supplier, the company came across Turck with its extensive portfolio of sensors, connection technology and I/O systems, which could easily meet the demanding requirements involved, while also providing I/O-Link functionality.

One of the leading manufacturers of exhaust systems chose Turck’s BL20 modular I/O system in order to provide a highly flexible I/O solution. A special feature of the new production line is the fact that fieldbus systems have to communicate with different controllers – an ideal application field for Turck’s BL20 modular IP20 I/O system. These multiprotocol gateways, which speak Profinet, Ethernet/IP and Modbus TCP, feature the necessary I/O slices to enable the system to bring different types of signal to the controller and also link different blocks of the production line. The system integrator was responsible for the installation and integration of the entire automation solution, and spoke to Turck about the sensor and I/O requirements early in the design phase.

IO-Link ensures efficient production

The user benefits enormously from the flexibility that IO-Link provides for the requirements of this system. Turck’s BL20-4IOL gateways with IO-Link master modules and the IO-Link-capable IP67-TBIL I/O hubs bring up to 16 switching signals from the field to the control cabinet via a single three-wire cable. The TBIL functions as an IO-Link slave, bringing 16 binary signals to the IO-Link master on the BL20 gateway. This considerably reduces wiring effort and wiring errors. The alternative passive junctions with large multipole cables are more expensive and time consuming.

Another benefit of IO-Link in the production line becomes apparent when tools are interchanged: “The clamping devices for the products have to be changed frequently in the plant. Here, the IO-Link modules for BL20 offer a high level of flexibility. During the installation, we can quite simply adapt the BL20 system and add more signals or reduce them. “With every additional expansion or upgrading of the plant we benefit from this flexibility,” says Selim Çağatay, the responsible control technician at Teknodrom.

Efficiency through decentralised IP67 I/Os

Even at the production lines for MIG (metal inert gas) welding, the smart IO-Link solution is significantly simpler, faster and more economical to implement than multiple cable systems. It also makes a major contribution to quality assurance. All signals are collected via Turck’s TBIL IP67 I/O hubs and then forwarded to the BL20 system via a single three-wire line. The IO-Link master and multiprotocol gateway handles the additional communication with the controllers via Ethernet. Thanks to the digital IO-Link transmission, the user saves on the expense of shielded cables and other EMC measures. The Turck solution also saves installation costs and is easy to maintain.

Flexible solution for the automotive industry

For users wishing to fully exploit the possibilities of IO-Link, Turck offers an extensive portfolio, starting with a host of sensors, cables, inductive couplers and I/O hubs, right through to programmable fieldbus and Ethernet solutions. Customers not only benefit from the comprehensive offering for IO-Link and the company’s many years’ experience in the automation of automotive production lines, but also from a host of application-specific sensor and fieldbus solutions for this sector. With Turck multiprotocol, the company has developed a technology that combines the three globally used Ethernet protocols (Profinet, Ethernet/IP and Modbus TCP) in a single device – both with IP20 and IP67 protection – as a modular system or also as compact block I/Os.

For more information contact Brandon Topham, Turck Banner, +27 11 453 2468, brandon.topham@turckbanner.co.za, www.turckbanner.co.za
Black Rock Mine Operations (BRMO) is operated by Assmang and mines manganese ore at the complex situated 80 km northwest of Kuruman in the Kalahari. The Black Rock Project, established in 2010, focuses on developing new mining opportunities at BRMO in order to optimise the output of high-grade manganese ore products. The project further aims to ensure BRMO’s sustainable life that would have valuable implications for the company and its employees, the surrounding communities and the region. The multi-billion rand project is to be executed over a period of six years, and aims to modernise the mine, including underground and surface plant infrastructure, in order for it to mine the manganese resources more cost effectively. Other planned outcomes include creating flexibility to ensure BRMO can react more effectively to changes in market product requirements.

Goals

- To use technology as an enabler in order to respond to and sustain business-related demands and pressures.
- To break down the silo mentality.
- To apply modern digital solutions, enabling enhanced decision making and real-time performance management to drive performance excellence.
- To standardise business rules and practices.
- To integrate various sources of information – from automation, PMIS, electrical and fire detection to asset management systems – in order to provide operational staff with a holistic view of the mine operation’s entire value chain, a centralised view of all KPIs, and one version of the ‘truth’.
- To bring about proactive attitude rather than being reactive.
- To empower control room operators to make appropriate decisions by providing the right information to the right people at the right time.

Starting BRMO’s digitalisation journey

BRMO’s realisation that today’s technology must align to today’s business requirements through modern strategy and the training of staff was the catalyst for the evolution of its Central Control Room (CCR).

Designed and equipped with an emphasis on corporate branding and ownership, the high availability of the CCR’s services was an essential component of the overall design. “Driven by a 10 metre video wall with Wonderware’s OMI, a first for South Africa, this innovative project provides both mine management and the operational team with a centrally controlled environment, operated via an integrated and situationally-aware dashboard,” explains BRMO senior general manager, Pierre Becker. “This setup enables enhanced decision making, delivering the proactive ability to recognise opportunities and address challenges.”

BRMO’s road to modernisation is supported by core services, such as power, network and datacentre infrastructure to ensure business availability, continuity, and effective data recoverability. It thus comprises a number of enablers, including enhanced networking, the creation of a single, logical metro-cluster datacentre, a high performance processing platform, upgraded virtualisation technology, a complete power management solution and a video wall.

The evolution of the new CCR

“The scope for the new CCR included provision for a video wall, the physical size and technology of which had to lend itself to expansion, as well as being reflective of the value chain, from mining to dispatch,” says project engineer, Jaco van Heerden. “It also needed to facilitate centralised communication and a collaborative environment between functional disciplines to ensure alignment between key stakeholders.”

Using a strategy for process control systems developed in 2015 with Wonderware SA as the guiding principle, the BRMO PLC/scada
specification was drawn up. It also took into consideration the consolidation of the extensive existing Wonderware installed base, as well as the standalone and proprietary scada systems, that were being migrated from a highly fragmented environment into one centralised location.

“Prior to the implementation, through various audits across many sites, we realised that there was a gap within our system hierarchy when it came to integration and alignment between the business and process control systems,” adds van Heerden.

During the first phase of the project, existing Wonderware System Platform objects and data were used to create an object-based model that was then utilised to define a KPI tree, which accurately represented user requirements. This system was then built in Wonderware System Platform 2017, and connections made to all data sources. Parts of this design included the visual representations that made use of Wonderware Situational Awareness principles, a design approach devoted to providing operators with the most relevant and necessary information at the right time, which included the definition of alert criteria and visualisation, trends, dials and displays of equipment states.

The end result was the definition of screen layouts made up of five virtual displays, which provides BRMO with a single view of the entire process. KPIs and equipment of the entire value chain are viewable, rather than just a copy of the scada screens. Given the ability to extrapolate or predict values through projection, the viewer is able to understand the effect of current conditions on future performance.

Business benefits realised

“The new centralised environment and its associated services is regarded as the start of many new opportunities in the future of digital transformation at BRMO,” continues van Heerden, “as it provides an indispensable tool when it comes to enabling better control and decision making.

“The centralised control environment is being used as a vehicle to standardise business rules and practices. Controlling, coordinating and reporting from a central environment, results in information that is less biased to a sub-discipline as decisions are based on what is best for the value chain. Only a view on the total value chain can achieve this.

“Furthermore, the video wall combines information not only from the control environment, but also from the PMIS surroundings, enabled with BRMO business rules which allows us to generate a rich display for the control room operators, progressing from the purely perception nature of work, to comprehension. This enables the operators to react faster to problems and, in so doing, have a positive impact on plant utilisation and availability.”

The establishment of the CCR and supporting services was instrumental in the change process by improving in-shift reporting, from less than 50 percent to a sustained 90 percent. In addition, the new environment has provided BRMO with access to a richer source of cleansed and validated data, which has allowed for the exponential growth of its business intelligence (BI) capability.

In terms of future growth, the solution provides the requisite flexibility and scalability to add sophisticated systems such as fleet management for display and baselining on the video wall.

For more information contact Su-Anne Willemse, IS³ – Industry Software, Solutions and Support, +27 11 607 8541, su-anne.willemse@is3.co.za, www.wonderware.co.za
Contents measurement in silos

Each industry provides its own challenges with regard to accurate process control. In the mining and metal processing industry, accurate level measurement is a challenge due to the increased volume of noise, dust, heat and, in some cases, zone specification safety requirements.

UWT Level Control has developed its instruments around the problems faced in the field. Decades of research and fine tuning have resulted in the Nivobob series of plumb bob sensors, which are used for continuous level measurement in storage bunkers and silos, as well as for interface measurement. When it comes to the mining industry, successful level measurement can be obtained in many applications through the UWT Nivobob continuous level measurement device. It uses a simple electromechanical principle, and is a reliable all-rounder in bulk-silo monitoring and stockpiling under harsh conditions.

The sensor weight, which is tailored to each specific application, attached to either a tape or rope, is electromechanically lowered from the top into the vessel or pit. Once the sensor weight rests on the material, the winding direction of the motor changes and the sensor weight is rewound to the upper stop position in the device. For interface measurements, the sensor weight can be adjusted according to the density of the sediment.

The distance is electronically measured and, together with the preprogrammed silo geometry information, the microprocessor converts this distance into a volumetric output signal of 4-20 mA, Modbus RTU or Profibus DP. As the system is immune to dust, EMI, humidity and caking, the Nivobob always delivers a reliable level measurement. It is simple to operate and durable, which keeps maintenance and downtime to a minimum.

Contents measurement in raw coal silos

A coal mine required a reliable level measurement technology for a 17,75 x 1,5 m coal silo. The requirements included optimal performance in the dusty environment and easy installation under harsh conditions.

For this application, the Nivobob NB3200 was implemented as an ingeniously simple solution. In the dusty environment, the electromechanical system operated reliably and installed with ease. Due to the integrated cleaner mechanism on the inlet guide, dust and other contaminants were not able to penetrate the mechanical area inside of the instrument. The Nivobob NB3200 was recommended in this instance for its robust and long-term operational capabilities in heavy mining applications.

Telco sensors in conveyor belt monitoring

Ordinary belt monitoring units can detect belt failure, but many require frequent maintenance for reliable operation. This is why Telco designed a system that ensures peace of mind for the plant owner.

The unit makes use of Telco infrared sensors to monitor the belt position at all times. These sensors are robust enough to handle the mining environment without problems as they are not affected by sunlight, water, dust or dirt. Units are available in various options depending on customer requirements. The most basic option will detect belt tear in the centre of the belt only. The next level detects belt tear and alignment. These two options can be supplied with an alarm indication only, or with voltage free contacts that can be incorporated into the PLC/scada system.

The unit has been installed and tested in extremely harsh environments and has passed all tests. In one example, the sensor head was ground away by coal build-up, but it still worked without a problem.

Technical information

The frame is designed in a U-shape to fit around the conveyor. There are no sharp edges that can damage the conveyor and the powder coated steel can be supplied in various colours.

The sensors: two infrared transmitters and two infrared receivers are placed one on each side of the conveyor. These can be doubled up for even more protection if required. The amplifier is not situated on the transmitters or receivers but in a separate standalone unit, which can provide up to a 10 second delay to eliminate nuisance trips.

Failsafe: the system is designed to be failsafe, meaning that a power or system failure will also stop the conveyor.

Power supply: the system can be supplied with 24 VDC or 24 /110/220 VAC – contacts are rated up to 10 A.

Protection against the elements: the amplifier and relays are fitted inside an IP65 box. The frame and sensors are weatherproof as described.

System integration: the system has voltage free contacts that can be used to connect to a PLC, which can then also be connected via a communication network to a scada system.

Maintenance: The system can be tested by manually disconnecting the transmitters and holding them in line with the receivers.

For more information contact
Gail Norton Instrumentation Agencies, +27 31 701 4861, telco@telcosa.co.za, www.gailnortoninstrumentation.co.za
The presence of methane gas in coal mining processes is highly probable, and monitoring methane levels in operational mining sections has become obligatory. Legislation calls for the installation of methane monitoring technology on mining machines to monitor and inhibit production whenever the existence of methane beyond predetermined levels is detected. As a result, methane monitoring technologies have become the gold standard in coal mining applications. Use of modern-day technologies, such as Monitech’s Hazardous Area Control System, has helped shape the coal mining industry. “It is legislated that purpose-made equipment is used. The technology must be approved under the relevant standards for equipment to be used in hazardous areas,” explains Renier Rautenbach, general manager of Monitech.

Monitech’s Hazardous Area Control System has continuously evolved over the years to become the mainstay of the coal mining industry. As Rautenbach explains, one of the key benefits of this is its versatility, which allows it to be adapted to any required platform. “The equipment is also very flexible in terms of its application capabilities,” he continues. Rautenbach also emphasises Monitech’s strong commitment to its R&D to maintain a competitive edge and market dominance in a competitive trading environment. He highlights the importance of R&D in the development of Monitech’s products and solutions, as well as improving the performance of existing ones. “The key benefit of using this particular system is that it was designed around the requirements laid down through continuous engagement with our customers to ensure it is best suited to their needs,” he says, adding that Monitech is continuously working on new development areas to further meet the ever-changing needs of its customers in the quest to maximise underground safety and productivity.

The methane detection field was the first business area in which Monitech started operating, and remains the cornerstone of the company’s success. “Monitech provides in-depth system training to ensure maximum benefit for its customers,” says Rautenbach. “All Monitech’s underground support staff are fully qualified specialist underground artisans to ensure the best application-specific support for the company’s customers.

For more information contact Nick Murray, Monitech, +27 11 395 4312, nick@monitech.co.za, www.monitechmining.com
In line with its vision of embracing the technological revolution in the explosives and mining industry, AEL Mining Services, a member of the AECI Group in South Africa, has announced its official rebrand to AEL Intelligent Blasting.

The rebranding is aligned with the company’s mission to keep its global operations on the frontier of technology through the delivery of ground-breaking innovations; to offer state-of-the-art technological solutions to clients and to operate sustainably, without harm to people, the environment and the communities in which AEL operates. AEL through its offering aims to demonstrate the intelligence and thought leadership that goes into the execution of the ‘perfect blast outcome’.

“Our new branding seeks to capitalise on our successful growth and expansion, and supports our strategy to position the Group as the most intelligent choice in the market when it comes to blasting services and products,” says AEL MD, Edwin Ludick.

Through its IntelliBlast total value proposition, AEL deploys solutions that extract optimum value from any blasting operation through the combination of products and services. Each component of the value proposition is backed by an inherent intelligence that helps achieve efficiencies, safety and reduced total cost of ownership through blasting outcomes. AEL’s newly-launched Blast Consult team offers expert technical services across a wide range of related disciplines such as blast monitoring, design, timing, fragmentation analysis, technology conversion, consulting services and training in basic blasting principles.

**Customer centric**

In addition to providing expert technical services to meet the changing needs and challenges of the mining industry, AEL follows the ideal of partnering with customers to bring into realisation the products and services they require to take the mining industry into the era of digitalisation and smart mining.

“By partnering with our customers, we are able to ensure efficient and sustainable blasting practices by focusing on optimal blast outcomes, optimising blasting processes and solving blasting problems,” notes Ludick.

Blast optimisation: this focuses on customers’ unique requirements and the impact blasting would have on the environment. Safety, as always, is the primary objective. In order to optimise blasting outcomes, AEL has a number of tools and methodologies specifically designed to make scientific and informed decisions around blast performance assessment. The active loading system enables real time information pertaining to blasting parameters, for example: condition of blast hole, types of explosives loaded, quantity of explosives loaded, etc. This information is stored in a database for future analysis, comparison and fine tuning of blast inputs and results.

Mining productivity: this looks at the mining operation holistically to ensure that benefits are derived from improved efficiency in equipment, plant and beneficiation. AEL will conduct various checks to ensure that blasted rock suits and complements the design of equipment and plant. It is supported by AEL’s sophisticated blasting software IntelliHub, a suite of software that enables the design, predictive modelling and post blast assessment.

The value proposition that IntelliBlast offers is a fundamental component in the business’ global expansion strategy. AEL’s market-leading technology is already being used in Indonesia, Australia, South America and various locations in Africa. It has enabled various benefits to customers, such as reductions in blasting delays and improved uniformity of fragmentation while ensuring uncompromised safety at all times.

For more information contact AEL Mining Services, +27 11 606 0000, www.aelminingservices.com
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○ OMNI-LC digital indicator offers the possibility of displaying measurements locally and in plain text (with background lighting)

○ brass and stainless steel materials coming into contact with the media

Ex-versions available for use in explosion-prone areas.

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Endress+Hauser has completed its portfolio of radar instruments with Micropilot FMR60, FMR62 and FMR67. The new Micropilot series provides the company’s first instruments with 80 GHz technology, which has been developed according to the safety-by-design concept of IEC 61508. Furthermore, they belong to the first generation of level instruments that, like many flow instruments from Endress+Hauser, support Heartbeat Technology.

Endress+Hauser presented its new level campaign during 2017, but adds tongue in cheek that nobody can actually do anything with 113 GHz. All they did was add the frequencies of the existing instruments to demonstrate the overall company competence in the radar range. The new level campaign is therefore called ‘113 GHz + Your Wavelength’. Endress+Hauser is not concerned with faster, higher, further. At present, everybody is talking about the highest radar frequencies in the industry. But the real issue is finding the best fitting frequency for each application. In order to accomplish that, staff must listen very carefully to the requirements of customers so that they can give good advice. The aim is to find the right wavelength based on a common understanding.

In the area of tank gauging, Endress+Hauser has launched Micropilot NMR81, the first highly accurate instrument with 80 GHz technology for the oil and gas industry. Now, the company is adding Micropilot FMR6x to serve other industries. Accuracy is at stake, but safety and the provision of simpler processes for customers are equally important. For the first time, an 80 GHz process radar is available which pursues the safety-to-design concept, thus making the life of customers much easier in terms of safety. In addition, the product offers a wide selection of Ex approvals. Improved focusing of the radar signal as well as dynamic algorithms provide reliable, stable measurements with a measuring range of up to 125 metres and an increased measuring accuracy. The measurement is unaffected by baffles or obstacles at the tank walls. Due to the innovative antenna design, build-up and condensate do not impair the measuring result. The interactive commissioning software makes this task fast and easy.

Heartbeat Technology

Instruments with their own pulse beat incorporating Heartbeat Technology have only been available at Endress+Hauser in flow instrumentation thus far. The preconditions for predictive maintenance and documented verification have already been created in the new Micropilot. This means that every measuring point can be verified and documented in assembled condition and without any interruptions. A simple, predefined procedure leads the maintenance staff through the verification and documents the results in an unambiguous manner. The guided SIL proof test according to the safety manual and included documentation also saves time and costs. An automatically generated test protocol supports the evidence concerning regulations, laws and standards. The monitoring area of Heartbeat Technology provides instrument and process data, thus facilitating trend recognition for predictive maintenance. The aim is always the optimisation of processes in a targeted manner. Therefore, a combination of instrument and process parameters provides all important details for a respective analysis.

A wavelength for all situations

113 GHz: the best fitting radar frequency for every level application.
IR thermocouple offers noise immunity

With twisted shielded pair thermocouple extension wire, an Exergen IRt/c can be mounted as far as 300 metres from the readout device, even in harsh electrically noisy environments. The extraordinary noise suppression characteristics designed into the unit make this possible, without using a transmitter. The housing is electrically isolated from the signal leads and is connected to the shielded ground of the extension cable. For long distances, the twisted shielded extension cable should be used, and the shield connected to a good electrical ground.

A demonstration test was performed with a 300 m coil of twisted shielded pair of extension wire, with 30 m unwound, connecting an Exergen IRt/c to a fast (100 msec response) A/D conversion module and a computer. As a noise generator, a 60 Hz 10 000 volt transformer and spark generator was set up to spark within 6 inches (15 cm) of the wire. The test results showed less than 0,1°C of noise error for any relative positioning of the wire, spark and transformer.

For more information contact Temperature Controls, +27 11 791 6000, sales@tempcon.co.za, www.tempcon.co.za

Handheld infrared thermometers

Within the Calex range of infrared temperature sensors is the ST680 Series of high-quality handheld thermometers with laser sighting and large backlit LCD display. The instruments measure in a wide temperature range from -50 to 1000°C with 0,1°C resolution. The series also offers a superior 50:1 field of view which helps to minimise errors by producing a small diameter measurement area.

The model ST689 accepts inputs for type K thermocouples and has a USB data output.

The emissivity setting is adjustable from 0,1 to 1 and all models provide adjustable audible alarms. Readings can be taken in either °C or °F, and when the trigger is released the last measurement is held for approximately six seconds before the unit automatically turns off.

The instruments operate in ambient temperatures from 0 to 50°C and are powered by a standard PP3 9V battery. Each device is supplied complete with a soft carrying case.

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

Dosage and fluid media monitoring

Kobold’s ZED-D electronic dosage devices are ideally suited for dosing and monitoring fluid media. They process the signals from separately-installed flow sensors and are mostly freely configurable. The devices are suitable not only for panel mounting, but also robust aluminium field housing (IP65) for wall or pipe mounting and direct fitting.

For integration into standard industrial automation and monitoring systems, the intelligent electronics have two control inputs, one dosage output, plus another switch and one analog output. Two relays are provided for dosage and monitoring. Whether for pump control, flow monitoring or filling and fine dosing, a large variety of possible settings provides the best possible adjustment for the task at hand. This includes free scaling and a choice of engineering units, while a password protects any settings made against operating errors.

A well-arranged, easily readable two-line display indicates the present flow and dosage quantity. The devices are operated by using menus and keys, and the start/stop button can be used to interrupt the dosage process.

Other features include:
- 2 x relay outputs.
- Sensor supply.
- Analog output.
- Free scaling, min/max memory.
- 2 x 8-digit LC display, backlit.
- Frequency input: 0,2-2000 Hz.
- Switchboard installation or field casing.

For more information contact Instrotech, +27 10 595 1831, sales@instrotech.co.za, www.instrotech.co.za
Yokogawa’s Sencom 4.0 platform

The OpreX analyser family that enables the flexible design and operation of liquid analysis systems.

By combining field-proven design of application-specific sensors with the new Sencom 4.0 philosophy and functionality, performance is guaranteed throughout the lifecycle of the process measurement, even in the dirtiest applications. This allows organisations the flexibility to adapt to changing industry requirements.

Liquid analysers are utilised in a wide range of industries, including power, water and wastewater treatment, semiconductors, food, pharmaceuticals, iron and steel, pulp and paper, petrochemicals and chemicals. There are two basic types of transmitter: the 4-wire devices with separate cables for power supply and output, and the 2-wire devices that use the same cable for power supply and output. Yokogawa supplies both. Yokogawa’s 4-wire transmitters are typically used for specific applications, such as pH measurement, and the FLXA21 and FLXA202 2-wire transmitters can flexibly accommodate multiple sensors of the four basic types: pH/ORP, conductivity, inductive conductivity and dissolved oxygen. Although the FLXA402 is a 4-wire system, it can connect to multiple sensors, perform diagnostics and communicate digitally with host systems.

To facilitate optimal processes and improve efficiency of personnel, Yokogawa has placed a strong focus on its digital smart sensor Sencom 4.0 platform. Following the commitment to co-innovation, this generation of process control solutions was realised in collaboration with customers. Sencom 4.0 combines measurement, control and information for a more connected solution. The new liquid analyser platform provides full visualisation, while improving the operation and reliability of online process analysers. It utilises the latest sensing technology and asset management tools in order to give users the power to see more and do more.

Product features
FLXA402 4-wire liquid analyser
This instrument can work with existing analog sensors (pH/ORP, conductivity, inductive conductivity, and dissolved oxygen) and optical dissolved oxygen sensors, as well as the SA11 Sencom smart adaptor and its dedicated sensors. By combining with the SA11 adaptor and the BA11 junction box, it is possible to connect up to five sensors, which reduces both system cost and footprint. HART7 and Modbus protocols are supported for the transfer of diagnostic data and other device information to a host system. Connection to the cloud is also facilitated and therefore the construction of an IIoT environment for improved field maintenance.

SA11 Sencom smart adaptor
The adaptor has functions for data conversion, transmission, calibration, and diagnosis, and is intended for use with dedicated sensors. It supports the Modbus communications protocol, and in addition, can connect directly to the UM33A-5 digital indicator; the FieldMate versatile device management software; as well as control systems, recorders and indicators that support the Modbus communication protocol.

The SA11 also has the ability to store sensor calibration data and other types of digital information, which can then be transferred to a laboratory or other remote location. This reduces the amount of maintenance work that needs to be performed in the field and helps to ensure that the device stays properly calibrated, thus reducing downtime.

Verified performance and reliable measurement
Maintenance and calibration in the field can easily take half an hour per measurement on a monthly or bi-weekly basis. With more equipment to maintain, the Sencom 4.0 platform utilises the integrated hot swap and plug-and-play functionality, which significantly decreases downtime. The Process Guard and Maintenance Manager functions allow users to predict maintenance checks and sensor replacement. Since the sensors are pre-calibrated, they can simply be changed using the plug-and-play ideology. When the sensor is connected to the analyser in the field, the latest calibration data will automatically be uploaded making calibration in the field unnecessary. This significantly simplifies maintenance and service.

Preparing for the future
Industrial automation is moving towards smart products, with sensors changing from analog to digital. This transition can affect plant operations and take time to implement. With the new Yokogawa Sencom 4.0 platform, upgrading to next generation product is easy, and an upgrade transfer can be done at any time with little impact on operations.

The platform accelerates time-to-value of the new technology and provides the flexibility to move data and workloads on an ongoing basis. In future, it will give more insight into total measurement solutions and will enable enhanced capabilities such as cloud connect and data mobility, thereby providing more credible data through the entire lifecycle of a product. Yokogawa’s Sencom 4.0 platform will be released in South Africa in early 2019.

For more information contact Eugene Podde, Yokogawa SA,
+27 11 831 6300, eugene.podde@ao.yokogawa.com,
www.yokogawa.com/za

www.instrumentation.co.za
Compact differential pressure transmitter

The Halstrup Walcher P 34 series differential pressure transmitter is designed for pressure monitoring applications in cleanrooms, laboratories, pharmaceutical plants and operating theatres as well as for special uses in machine and plant construction. In addition to measuring the differential pressure, the instrument also records positive and negative overpressures as well as flow rates or volumetric flows.

The measuring range is scalable from 10-100% and two optional contact points allow the user to connect visual or audible alarms that are triggered any time values rise above or fall below specified limits. The transmitter can be configured easily via the USB interface, while a selectable time constant allows the transmitter to be adjusted perfectly to the pressure conditions and thus ensures a stable output signal. The P 34 can be mounted on top-hat rails.

Other features include:
- Measurement of differential pressure, volume flow or P-/T-compensated volume flow (optional) possible.
- Volume flow can be configured via k-factor, dPmax/Vmax or 20 individual values.
- Scaling, characteristic line form and many other parameters can be set via PC-software (optional).
- Two floating switching relays (optional).
- Output signal can be configured 0-10 V or 0/4-20 mA.
- Highly stable measurements thanks to cyclical self-calibration of the zero point.

For more information contact Vepac Electronics, +27 11 454 8053, info@vepac.co.za, www.vepac.co.za

HIGH PERFORMANCE INDUSTRIAL INFRARED PYROMETERS FOR NON CONTACT TEMPERATURE MEASUREMENT

Where Wavelength Matters

Williamson is a manufacturer of exceptionally accurate infrared pyrometers for industrial applications. Through thoughtful pyrometer design and careful attention to wavelength selection, Williamson pyrometers can accurately view through common industrial interferences including steam, flames, combustion gasses, water, plasma and oil.
Case History 164

More on valves that do not control properly.

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

I often publish articles showing valve problems. One of the reasons is that I do not think many people understand that valves are generally responsible for 75-80% of all control loop problems. When it comes to relatively fast control loops, such as flow, valve problems can often be ‘got around’ as feedback control is so powerful, and provided the controller is well tuned, it often manages to overcome the valve problems.

Consider this example

A case in point was a splitter reflux flow control loop in a refinery, which had a really bad valve. The operators were battling to control it and had the loop in manual, but even then they found it extremely difficult to get the flow to reach stability at the correct value.

Figure 1 shows the open loop test. It is interesting because it shows so many problems with the valve:

- The valve overshoots hugely on closing and opening steps.
- It is terribly oversized, probably by as much as eight times, which magnifies by eight all the problems as seen on the PV.
- The positioner/valve combination is almost unstable and at times does go into a cycle.
- The valve sticks badly.
- The valve behaves differently on different steps, which means it is not repeatable.

When one encounters a control loop with a valve like this, you should know that it is not possible to get proper control, so it is essential that the valve be fixed or replaced as soon as possible. However, it is sometimes possible to get a measure of control in the setpoint region by deliberately tuning the controller with fast unstable parameters in order to make it cycle around setpoint. This can sometimes help keep the plant working until the valve can be fixed, which was done here and the resultant limited control cycle can be seen in Figure 2 – certainly not nice, but often better than no control at all.

This solution should be used with caution, as cycling of this nature can sometimes cause problems with other interactive loops. However, if the flow loop is a cascade secondary to a slower loop, such as level or temperature, it will ensure that the average flow going into the process is correct, since the cycle is relatively fast.

Stick-slip cycles

The second example deals with a valve that exhibited a ‘stick-slip’ cycle.

Stick-slip cycles are one of the most misunderstood phenomena that occur on fast self-regulating processes such as flow loops, and are generally caused by valve or valve/positioner combination problems. On observing a stick-slip cycle, at least 95% of plant personnel are positive that it is a tuning problem and demand that the controller be retuned.

In this case, the tuning was pretty good and it took an open loop step test to analyse the problem with the valve – shown in Figure 3. On initial inspection it seems as if the valve...
CONTROL SYSTEMS

is working perfectly, as it appears to follow step changes on the controller output very well. Deeper inspection shows that the valve is sticking quite badly though as it takes quite a few seconds to respond to the controller’s output steps. In particular, after one reversal in direction it took about seven seconds before it moved. This is far too long for a flow loop, which generally has deadtime of one, or at the most, two seconds. It is clear that the valve is sticking badly, and the positioner is doing a fantastic job of overcoming this and getting the valve smoothly to the correct position without overshoot.

Flow loops fall into the simplest class of process dynamics as they effectively can be defined as a self-regulating process with a single first order lag and deadtime. The correct pole cancellation to eliminate the process lag is to set the controller’s integral term equal to the time constant of the lag. Once that has been done, one merely has to adjust the controller’s proportional gain to get the control response desired for the particular loop.

Typically, flow loops have lags of around one to two seconds, and similar deadtimes. Therefore, the controller typically needs to be tuned with an integral setting of 1-2 sec/repeat, which is relatively fast. So, if the valve sticks as in this case, then the integral term starts what is known as ‘winding up’, which means it sees a constant error and starts ramping up (or down) the controller output to try and get the valve to move. The result is an excess movement in the controller’s output in the form of a constant ramp. At the point where the valve moves, the output of the controller immediately starts heading in the opposite direction. The positioner sees that the controller’s output is asking for a certain valve position, and moves the valve to that position, but unfortunately that position takes the PV to the other side of setpoint as the controller’s output has moved too far.

The net result is a typical waveform with

Figure 2.

Figure 3.
the controller’s output forming a saw-tooth, and the PV moving in close to a square wave pattern. These waveforms can be clearly seen in Figure 4.

Obviously one solution would be to slow down the integral. However, in real life it ends up in a term that is so slow that decent control response cannot be obtained. Although many people think that flow loops do not need to be controlled quickly, it must be noted that many of them are cascade secondaries, which are there to remove valve problems from the slower primary loop i.e. the secondary loop really needs to be as fast as possible. In cases like this, if the valve cannot be sorted out quickly, it is better to leave it with a stick-slip cycle as in many cases these are not actually a problem, since they are relatively slow and small and will not seriously affect the valve’s life, or cause process problems.

In cases where they can cause effects, like interaction, particularly when the valve is oversized, a good solution is to put a small band around setpoint, about the size of the amplitude of the stick-slip cycle, and slow the integral down in that band. This is an excellent solution where the flow loop is a cascade secondary.

As mentioned above, many people think the stick-slip cycle is a tuning problem and so detune the controller until the cycle stops. As discussed in a previous article, I think of a loop in manual as the ultimate slow tune. In general therefore, if you slow a loop down far enough it will stop cycling. I refer to this as ‘being tuned into manual’.

Panel-mounted thermostat with safety feature

Jumo’s new heatTherm P300 3-phase panel mount thermostat is available with a maximum switching capacity of 30 A/480 V. An important new safety feature capability is the trip-free function.

The electromechanical thermostat can be operated without additional auxiliary energy and is available with various connections such as tab connectors, screw terminals or push-in connections. Examples of application areas include electronic screw-in heaters or deep fryers and hobs in the food industry. The device is also available as a safety temperature limiter. In the event of a malfunction, the P300 will set the system being monitored to a safe operating status.

All Jumo thermostats from the heatTherm series come with capillary break protection. In addition, they are characterised by high levels of process reliability and long-term stability. The maximum switching point deviation is only 5% calculated for a total operating life of 250 000 hours. The cadmium-free design makes the device environmentally friendly and RoHS compliant.

For more information contact Anastas Schnippenkotter, ASSTech Process Electronics & Instrumentation, +27 11 708 9200, info@asstech.co.za, www.asstech.co.za
LSIS set to change the perceptions?

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Almost all modern automated machines and systems require precise, reliable and cost-effective linear measurement. And although this need increases in line with demands for greater efficiency, speed and quality, in reality, most common industrial applications do not require micron accuracy.

The problem here is that most engineers seeking a reliable and sufficiently accurate linear measurement system, typically have few viable options. Most of today’s solutions are considered too expensive, too complex or are overly specified, while low-cost alternatives quickly reach their limits when longer measuring lengths are required. Factors like these apply to systems such as scales, potentiometers and magnetostrictive systems, among others.

Over-specified solutions
Many optical systems, while offering high levels of accuracy, are often over specified and too costly for the task in question. Most common industrial applications do not demand accuracies of a thousandth or even hundredth of a millimetre. Also, in terms of environmental performance, the susceptibility of optical systems to the ingress of contaminants can be an issue.

With potentiometers, factors such as extreme temperatures, vibration, wear and susceptibility to foreign matter are all well documented issues, while magnetostrictive systems also suffer from temperature effects, as well as sensitivity to shock and potential inaccuracy over distances of less than 100 mm.

A new era of linear measurement
With the shortcomings of existing solutions sometimes precluding them from use in particular applications, there is a need for alternatives. One such measuring system, which has emerged more recently, is Sensoflex SFI-plus from Parker Hannifin. Simple in design and able to provide a resolution of 0,1 mm, this new technology can match the requirements of many common positioning operations. The possible objection, that this measurement accuracy is insufficient, overlooks the fact that in most cases no higher accuracy is required.

Typical applications to benefit include conveyor and storage technology, lining work on wood or plastic machines, automatic cut-to-length machines, and worktables and transportation carts. Designed for both linear and rotary motion, Sensoflex SFI-plus operates reliably within pneumatic, hydraulic and electrical systems.

Two principal components make up this contactless magnetic length-measuring system: a 10 mm wide, self-adhesive magnetic scale and a reading/sensing head with connection to an external control unit. Contactless and wear free, scanning is carried out magnetically. In terms of operation, the read head converts the magnetic poles into electrical signals that are processed by downstream counter inputs, using a PLC, PC or digital counter. Two pulsating, 90° out-of-phase counter signals (phase A/B) are provided with a 0,1 mm resolution. Signal integrity is maintained even at travel speeds of up to 10 m/s.

Cost considerations
The cost-effective nature of such a solution stems from the fact that the scale itself is little more than a magnetised strip of tape stuck to the mounting surface. Further economies are achieved through quick assembly and minimal time required for wiring.

This new concept in linear measurement also meets many other common application demands. For instance, the system is compact as it can be mounted directly on the actuator profile, while flexibility is derived through straightforward integration in existing systems.

Universal application is facilitated through a choice of drive technologies and the fact that the system is suitable for almost any control or display unit with a counter input. User friendliness is enhanced via variable measuring lengths up to 32 m, the only requirement being that the scanning head is also able to cover the entire travel distance. Lastly, the system is resistant to both vibration and impact, and offers a degree of protection to IP67.

High-accuracy solutions are not only expensive, but often require careful installation. Additionally, the adoption of such systems might not be possible in many applications because of factors such as vibration or differential thermal expansion. Here, the lack of robustness of high-accuracy solutions can lead to failure or malfunction. Ultimately, the best strategy is to specify an approach that accurately reflects the needs of the application – performance beyond that is unnecessary.

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

Ultrasonic sensors for the OEM business

Turck has expanded its ultrasonic sensor family with the introduction of the RUS0 Eco series for price-sensitive OEM projects. The company was able to develop an ultrasonic sensor based on the latest sonic transducer technology, which does not make any compromises in quality in spite of its economy-based design.

The devices in the plastic threaded barrel are made from highly resistant liquid crystal polymer (LCP), and the translucent end caps with M12 connector, from Ultem. Both plastics have already proved their strength over long periods of use in other Turck products.

The RUS0 Eco series is available with a switch output as well as an analog voltage or current signal. The customer can choose here between a variant with an M12 connector output and a variant with a cable output. Retro-reflective sensors are available for conveyor belt applications.

These can be taught to switch at a fixed distance from a reference object and reliably detect all objects between the sensor and the reference point. The translucent end cap also offers the benefit that the switch state of the sensor can be clearly detected from virtually any angle.

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

Compact encoder with EtherCAT

Wachendorff Automation has extended its absolute encoder series WDGA with the addition of an EtherCAT interface. The WDGAS8F is a miniature encoder with bus cover for the EtherCAT interface. Due to its small size, it saves valuable installation space, which can be a decisive design consideration in new or advanced machines, as the trend towards smaller machines continues. Despite its compactness, the rugged bearing design ensures long service life and maximum durability.

The encoders are supplied in hollow shaft and clamp/syncho-flange versions. Multi-turn encoders are equipped with maintenance-free EnDra technology, while the innovative single-turn range with QuattroMag provides a high resolution of up to 16 bits and an accuracy of 12 bits. This makes it possible to use robust and durable magnetic technology from Wachendorff in many areas where previously only high-precision and sensitive optical measuring technology could be used.

The new EtherCAT absolute value encoders with SM3 mode, distributed clock and Can over EtherCAT deliver their high-precision position value with a cycle time 50 µs and are thus perfectly equipped for the latest controllers in the field. Plant and machine builders also benefit from the modular principle used for the design, which allows customer variants to be implemented quickly and efficiently.

For more information contact Edwin Brown, Vepac Electronics, +27 11 454 8053, edwin@vepac.co.za, www.vepac.co.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!
Pre-assembled panel systems for pumping applications

A complete range of robust pre-assembled irrigation and solar pump panel systems are available from ElectroMechanica (EM) for a wide range of pumping applications. “These solutions are designed not only to reduce energy costs, but also to conserve water and maximise productivity,” comments automation manager, William Cameron.

Additional benefits are automatic sleep and wake functions, and enhanced motor and pump protection. “Using Huba’s 528 pressure transducers, and Delta’s CP2000 pump-purpose drive, creates a robust combination that is exactly what the industry demands,” stresses Cameron. “The drive’s customised keypad layout means operational data is displayed on one screen, while sub-menu settings are easy to navigate.”

The pump panel systems are enclosed in weather-tight sheet metal enclosures that are available in various sizes, depending on the particular requirements of the installation. The uncluttered panel layout means there is sufficient working space in order to simplify installation, commissioning and servicing.

Preconfigured VSDs reduce the energy drawn by the pump motor controlling the speed, while maintaining a constant pressure on the line. This is critical in terms of overall efficiency, as even a small reduction in speed results in significant cost-savings. Other standard features of the irrigation pump panels include a panel-mount isolator, drive and control circuit breakers, power and control terminals, manual off/automatic selector switch, run and trip indication, cooling fans and vents, and a rotary setpoint selector.

Typical applications are irrigation, domestic water supply, fish farming, water livestock, solar-powered fountains, sprinklers, misters and soakers, ground dewatering for excavation, and construction sites.

The standard features of the solar or photovoltaic pump panels include a multi-status indicator lamp, an on/off selector switch, DC fuse protection (including a spare), no-flow input and underload protection, and maximum power point tracking software and manual override.

Cameron concludes that the niche irrigation and solar pump panel systems are aimed not only at diversifying into additional markets, but also to offer the full benefits of EM’s latest technology and products to the South African industry.

For more information contact Karen Zotter, ElectroMechanica, +27 11 249 5000, karenz@em.co.za, www.em.co.za
Cognex recently launched its new Dataman 470 barcode series. Most manufactured products use a 1-D or 2-D barcode to automate and simplify identification and capturing of data, but users must be able to read codes fast and accurately for maximum efficiency and cost saving. The 470 series offers superior 1-D and 2-D code reading performance, even on patchy codes from printed labels and direct part marking on shiny surfaces. The devices offer multicore processing power, new HDR+ imaging technology, a high-resolution sensor, advanced decoding algorithms, and setup that is simple for maximum coverage, speed and ease-of-use.

Advanced technology improves throughput and traceability
Cognex’s innovative imaging technology delivers unprecedented coverage and speed allowing greater process location and lower facility design costs. It enhances the image quality of 1-D and 2-D codes and reads barcodes not even visible to some conventional readers. The Dataman 470 has seven processing cores, enabling it to run multiple algorithms and processes at amazing speeds. It reads challenging 1-D and 2-D codes in varied locations while maintaining the high decode rates. It has an easy setup tool that provides step by step installation flow for efficient configuration. HDR imaging uses the latest CMOS image sensor technology, which is 16X more detailed than conventional sensors, to globally enhance image quality and contrast.

For more information contact Lenny Matome, Westplex, +27 11 787 0473, lenny@westplex.co.za, www.westplex.co.za

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New toolkits for innovation

Why you might want to bypass the DCS and scada systems.

Back in the 1980s, as a junior process engineer, I spent a great part of my first job working with DCS and scada systems. At the time, I was working on a synfuels plant that made use of a Honeywell TDC3000 DCS. Most of the field instruments were connected to the proprietary Honeywell LCN (local control network) and process engineers were not allowed to touch that part of the system. The DCS was connected through an interface to a local scada system, called Cygnus (later Adriot), running on a bulky PDP-11 minicomputer that required its own room. This was my playground. The 10 Mb removable hard disks were also bulky devices coming in a special foam-lined case, which at the time was our version of Big Data. This system was invaluable for monitoring and optimising the plant and a process engineer’s dream.

These early experiences with the PDP-11, using a real-time language from ICI called RTL/2, taught me a great deal about analysing large volumes of plant data. My view at the time was that fully automated manufacturing was ultimately possible, but only if instrumentation data was first consolidated in a DCS/scada system, and only then processed by external systems.

I soon found that this hierarchal layered model of integrating process and business systems, was shared by most of the instrumentation and control community, and also by the big software vendors providing ERP. Later, as I learned more about business processes, I realised that in practice, other federated data integration models were viable and there are many (and often better) ways of configuring data flows relating to a manufacturing process.

A new generation of sensors

Recently, I was interested to learn of several case studies coming out of the oil and gas industry where the IIoT is being used to make significant improvement, particularly in a mature industry like oil and gas.

On closer investigation I learned that many of these recent success stories involved IIoT sensors that completely bypass the DCS and scada systems. These sensors were never included in the original design. To solve specific problems new temporary sensors were located in places that previously had no instrumentation; such as the interior of furnaces, or monitors attached to the surface of moving equipment. In other situations additional performance data is now obtained from existing actuators; information that was previously never used by the DCS. This data stream accessed using a protocol called WirelessHART, connects wirelessly to an IoT gateway, which in turn streams the data to a third-party, cloud-service platform. The result of all these different techniques augments existing plant data with additional data streams accessed from the cloud. This then allows engineers to do a more powerful analysis of equipment performance than was ever possible using the existing scada data.

It occurs to me that the engineers and designers of industrial scale plants have always been focused on getting the basics right, such as traditional safety and operability, but hardly focus at all on optimisation. Optimisation requires a different mind-set, different instruments, different data analysis and different modelling systems.

The large expensive DCS/PLC and scada systems implemented in a typical project are not always suited for optimisation, the full requirement for which only manifests itself once the plant has been commissioned.

Cloud-based toolkits

The good news for engineers today is that no longer is it necessary to reconfigure and change already complex proprietary DCS systems to solve every operational problem. There are already a number of cloud-based ‘toolkits for innovation’ that will allow them to build specific diagnostic solutions that use state-of-the-art machine learning, modelling and advanced visualisation capabilities, without disrupting any existing critical control system.

The platforms on which these specialist IIoT solutions are built are evolving fast. For example, recently SAP positioned its Leonardo IoT cloud platform as a ‘digital innovation system’. Leonardo promises to enable exactly the optimisation scenario I have described. The solutions can be small and specialised, such as predictive maintenance on a specific machine, or much more complex such as energy optimisation or logistics management across an entire plant or supply chain.

Leonardo is a ‘container’ of complex interrelated technologies that are still evolving; it is a work in progress. A significant element of the platform is advanced analytics and machine learning. For those manufacturing companies that have a long-term vision, SAP’s cloud ecosystem platform is worth a closer look. There are other alternatives as well, as cloud vendors bring their own competing technologies to market. Ecosystems of partners and developers are also converging around industry standards and starting to package real-world solutions as templates. Owing to the relative newness of the technology, expect some vendor churn, fallout and consolidation ahead, but this should not prevent you from getting started.

We have come a long way from the DCS systems of the 1980s, which still serve a useful purpose. However, the pressing need for new rapid innovation has in many instances meant that these older proprietary approaches are no longer suited to the changing needs of manufacturers. There are now many simpler, more elegant and quicker to deploy tools for optimising plant efficiency. It is a wonderful time as vendors and manufacturers innovate together creating new opportunities to push efficiency and productivity boundaries even further.

Gavin Halse

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

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New performance management solutions for intelligent valves and pumps

By David Clayton, ARC Advisory Group.

While digital transformation has been getting its fair share of hype in recent years, end-users in the heavy process industries actually began digitising their plants decades ago with the introduction of ‘smart/intelligent’, digitally-integrated process transmitters and final control devices. Today, the vast majority of process transmitters installed for greenfield and major upgrade projects are smart, if not always fully digitally-integrated. However, historically, pumps and valves have tended to be the last field devices for end-users to digitise in their plants.

Advanced diagnostics and bidirectional communications can help improve process performance, condition monitoring and maintenance effectiveness, while reducing maintenance costs to a significant degree. This is particularly true for the traditional ‘bad actors’, such as control valves. Smart valves and pumps could also help reduce fugitive emissions to improve environmental compliance, and, in the case of safety-related valves, enhance plant safety.

With the emergence of IIoT-enabled remote management solutions, process industry end-users can begin to take full advantage of remote monitoring, analysis, and management services provided by valve and pump suppliers or third-party service providers. While leveraging the expertise of these external partners would appear to be a ‘no-brainer’, ARC research indicates that many end-users remain resistant to this concept.

Two examples of services that suppliers have developed to help their customers lower overall total cost of ownership (TCO) of their valves and pumps follow. Significantly, both services can also enhance plant safety and regulatory compliance.

Expertise as a service for valve maintenance

Several years ago, at an ARC Industry Forum, Shawn Anderson, senior research specialist for Emerson Process Management, gave a presentation on how that company is leveraging the IIoT to help end-users reduce valve-related unplanned downtime. Anderson’s group initially began looking at adopting IIoT technologies to collect valve health data from the field and provide more realistic failure information than could be generated in a laboratory. It soon became apparent that IIoT technologies were a natural fit for developing a remote monitoring service geared at optimising valve maintenance practices.

According to Anderson, what end-users really want and need is actionable control valve health information. End-users want to know what they need to do and when they need to do it to keep operations running. ARC research confirms this. Clearly, end-users can benefit from partnering with a trusted valve supplier (or third-party services provider) that can help remove the burden of valve maintenance to enable them to focus on their core competencies. Innovative new service models, such as Expertise as a Service (EaaS), in which remote monitoring and diagnostics services are bundled provide new options for end-users lacking in-house valve experts.

To succeed, this typically requires close cooperation between the valve or third-party supplier that has the valve expertise, IT suppliers that can provide the secure IIoT platform, analytics suppliers that can provide the appropriate analytics and visualisation tools, and the end-users themselves, who must be willing and able to provide the raw process data and, ultimately, act upon the information.
Flexible standardisation for data centres

Schneider Electric has created flexible standardisation for data centre operators that allows the company to support the different sized deployments its customers require, while eliminating inconsistencies across data centres.

“HyperPod is a rack-ready system for deploying IT at scale in increments of 8 to 12 racks,” explains Riaan de Leeuw, VP IT division, Anglophone Africa, Schneider Electric. “The freestanding support structure allows for air containment to various types of racks and can adapt to a variety of cooling and power configurations.

“It is equivalent to our custom builds, is flexible and scalable enough to fit our varied design concepts, has the quality and appearance we want to deliver to our customers, and can be quickly installed with minimum customisation. Basically, the data centre customers just have to bring their servers.

“In a US case study, Schneider Electric had to create a colocation environment that appeared and operated the same, despite multiple locations. The colocation spaces also had to be configured appropriately to handle dynamic density loads and multi-tenant needs.

“Fitting a 2 MW customer and a couple of 500 kW customers, in a 4 MW space takes flexibility. In addition, the client wanted its tenants to have the same experience regardless of their geographic location.”

Schneider Electric was on site, putting all the pieces together, implementing HyperPod for the first time and essentially creating a proof-of-concept to take to any of the other client locations. Once the prefabricated, premanufactured HyperPod arrived, the deployment of a 15 metre length of aisle containment space took only one week, compared to the three weeks it would have taken with old systems.

“IT in Manufacturing”

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www.instrumentation.co.za January 2019 51
Rockwell Automation and PTC have launched FactoryTalk InnovationSuite, powered by PTC, a software suite that enables companies to optimise their industrial operations and enhance productivity by providing decision-makers with improved data and insights. The new suite delivers complete visibility of operations and systems status from one source of information inside the organisation. The collaborative offering is the first to integrate technologies from both companies following the strategic partnership announcement in June.

InnovationSuite improves connectivity to operational technology (OT) devices on the plant floor, natively supporting the rapid, scalable, and secure connection of the most commonly used industrial equipment. Combined with data from information technology (IT) applications and systems, decision-makers can now gain a complete digital representation of their industrial equipment, lines and facilities, from anywhere in the enterprise.

Differentiated industry solutions
“Our offering is unique in its ability to improve how companies capitalise on the IIoT by combining expertise from industry, technology, and plant-floor professionals,” said John Genovesi, senior vice president, enterprise accounts and software, Rockwell Automation. “Now, we’re bringing innovative solutions from PTC together with leading analytics and manufacturing operations management from Rockwell Automation, for a differentiated industry solution.”

“We’re moving the needle on how leading-edge technology is applied in industrial environments,” said Catherine Knicker, head of strategic alliances, PTC. “Manufacturers have seen digital technology change, but their execution continues to follow practices established for the legacy business. This bundled offering will help organisations accelerate time to value and reinvent how they compete by breaking down barriers across their operations through a comprehensive approach to operational intelligence.”

Included in this collaborative offering are the FactoryTalk Analytics and MOM platforms, as well as PTC’s ThingWorx Industrial IoT Platform, which includes industrial connectivity from Kepware, and the Vuforia augmented reality solution. Key features of applications within the new collaborative offering include:

- Intuitive, user-friendly interfaces that give users a view of their operations by combining data from multiple IT and OT sources and tailored to their role. An operations manager, for instance, can view overall performance of a facility, or multiple facilities, before researching the performance of specific equipment or factors impacting OEE.
- Automated advanced analytics of IT and OT sources transform massive amounts of raw data into actionable or proactive information to improve performance and reduce the impact of downtime. Leveraging powerful artificial intelligence (AI) technology to simplify complex analytical processes, users can now proactively respond to issues ahead of any critical failures.
- Augmented reality (AR) delivers more efficient and effective ways of looking at digital information within the physical world. AR enables more efficient training, wider knowledge sharing, and better first-time fix rates. Through the bundled offering, maintenance, for example, can receive digitised work instructions containing real-time performance and service history information so technicians can better diagnose and fix equipment correctly the first time.

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Manufacturers have a responsibility to prevent workplace accidents by guarding against safety risks. However, reaching the desired safety level can be challenging as it can add complexity and reduce productivity. This article examines a unique approach known as zoned safety, which reduces complexity in the design of redundant pneumatic safety circuits. It explains the advantages of the concept over the traditional method of safety circuit design using dump valves, and lists the benefits for both equipment manufacturers and end users.

Introduction

A recent study by the Occupational Safety and Health Administration found that manufacturing accounted for 26% of work-related hospitalisations and 57% of work-related amputations – higher than for any other industry in the United States. Statistics such as these explain why there is considerable interest and focus on improving production machinery safety. It is vital for manufacturing companies engaged in the installation, operation and maintenance of production equipment. However, such machinery is becoming more complex and the rising number of interactions that take place between operators and machines makes it challenging for a company to safeguard its people and assets.

A strong emphasis on safety is especially important for those industries that use machines that incorporate horizontal or vertical movement and require intermittent to frequent operator interaction (e.g. load/unload operations). However, guarding against safety risks is not easy, as when changes are made to improve machine safety, operations can become even more complex. These safety measures often incorporate time-consuming procedures to stop machine operation, isolate energy, resolve issues and restart processes – all of which translate into lost production time. Even so, safety must always remain the number one priority, as a safety incident can result in damage to equipment, unforeseen costs, loss of productivity from shutdowns, and most seriously, injury to workers or even loss of life.

By implementing the right procedures and technologies, OEMs and end users can create safer manufacturing environments that reduce risk without compromising productivity. While end users are responsible for training employees in safe work practices, OEMs must design and build machines that are safe and compliant with government and industry regulations and directives. To accomplish this task, OEMs must conduct a risk assessment to identify the health and safety risks that exist. Machines must then be designed and constructed using methods that will reduce these risks.

Machinery directive and safety standards

Over the past two decades, standards have evolved to guide OEMs in producing safe equipment. In Europe, Machinery Directive 2006/42/EC became law in 2009, with the aim of protecting people’s health and safety during installation, use, adjustments and maintenance of machinery. This directive is
intended for manufacturers, importers, and dealers of machinery and safety components and applies to new machines built or used in Europe. It harmonises the level of safety of products designed and produced by different manufacturers.

The directive is supported by various standards. For example, ISO 13849-1 covers the design and construction of safety-related parts of control systems for machinery. These include basic concepts, principles for design, and engineering aspects that can be applied to production equipment to satisfy machinery safety.

ISO 13849-1 introduces three key concepts for the design of machinery and their safety functions. These are:

- The use of a risk analysis prior to design.
- Consideration of the quantitative aspects of the safety functions as well as a qualitative approach.
- The use of performance levels (PL) to assess the ability of safety-related parts of control systems to perform a safety function under foreseeable conditions. They are defined in terms of probability of dangerous failure per hour.

According to the European Statistics on Accidents at Work (ESAW), the period between 2009 – when Machinery Directive 2006/42/EC was applied – and 2013 saw non-fatality accident figures fall by 12%, and the number of fatal accidents drop by 15%. The incidence rate of accidents (accidents per 1000 employees) in manufacturing fell by 9%, and the amount of fatal accidents in manufacturing went down by 13% over the same period.

Even though this directive is initiated in and applies to Europe, it is important to have globally designed solutions that not only meet the European directive, but benefit manufacturers and users worldwide.

Traditional pneumatic safety circuit design using redundant safety dump valves
Visualise a production line with an operator loading a part inside a welding machine. When the operator enters or reaches into the machine environment, all equipment motion must stop to ensure safety. To meet the necessary safety requirements, the design of machinery that has pneumatic components has traditionally involved employing separate safety circuits with redundant dump valves, which shut off air supply, release air, and disable operation of the entire machine.

Although this approach has been used for many years, it has certain drawbacks. It wastes energy by repeatedly dumping all the compressed air in the entire machine, which must then be recharged upon start-up. Valuable time is taken up as operators are forced to wait for extended periods as entire systems restart. This method also adds significant complexity and unnecessary cost to machine design, manufacture and installation because it requires more expensive components and more complicated control structures, with a safety system required for each zone. Without these control structures, the sudden reintroduction of air into a pneumatic system can cause unintended motion of components, increasing the risk of damage to the machinery itself, or causing the products retained by jigs, fixtures or clamps to move or drop, resulting in damage, spills, lost product and scrap. Trying to avoid this damage and maintain expected output, some operators may be tempted to allow some machinery to remain active when it should not be, thereby inadvertently exposing themselves and their operations to increased risk.

It is worth noting that when used in a continuous cycle fashion, a redundant dump valve’s lifecycle capability may not allow the user to achieve the required Performance Level (PL).

A better way to achieve safe machine operation
There are three basic safety functions in pneumatic circuits: release of energy, return home, and stop/inhibit motion. Depending on a machine’s pneumatic content, any of these safety functions could be the most efficient and safest method. The traditional dump valve solution is the most appropriate for some applications. In many instances, however, it would be more efficient to stop/inhibit motion, return home, or use some combination of the safety functions tailored to the specific safety requirements of the equipment. It is sometimes also more efficient to inhibit specific portions of a machine while the rest of the machine operates normally.

This option has led to the emergence of a concept called zoned safety – an innovative technology that provides a simpler and less expensive approach to safety that meets the requirements of Machinery Directive 2006/42/EC and the ISO 13849-1 standard.

Zoned safety technology – introduced by Emerson on its ASCO Numatics valve island – simplifies the design of a redundant pneumatic safety circuit. It gives an engineer the capability to define and set up as many as three independent electro-pneumatic safety zones, while also allowing independent non-safe sections to co-exist within a single valve island assembly. The ASCO Numatics zoned safety valve island has been evaluated by TÜV Rheinland and is compatible up to category 3 Pld. Available with various fieldbus protocols, this is a suitable option for most manual load/unload stations and a wide variety of other industrial applications. Alternative solutions enable the isolation of only one zone per island, which can make them costlier and more complex.

Using the zoned safety concept, it is possible to customise a solution that is both safe and efficient. As the safety zones can be configured to shut down air and power only to the group of valves that control the machine’s specific motion in the operator’s vicinity, there is no need for the entire machine to be shut down. This ensures operator safety while allowing the rest of the machine to keep producing, even though these safety circuits are enabled.

When zoned safety capability is designed into a valve island platform, no redesign or safety redundant dump valve is required for zone control, and the user has optimal choices when selecting valve options, accessories, and flow requirements. The assembled product is very similar to a standard valve island that has been used by OEMs and machine builders for many years.

How do users benefit?
There are multiple benefits that OEMs can derive from the zoned safety valve island concept. Perhaps the most important is the ability to greatly simplify the design of a redundant pneumatic safety circuit with a valve island system. No longer is a separate safety circuit – with multiple redundant dump valves and other components that add complexity and higher cost – required to safely isolate sections of the machine.

The ability to easily and cost-effectively design multiple independent safety circuits into a single pneumatic valve island can reduce the number of safety system components by up to 35%, optimises the use of safety networks, and requires less plumbing. The approach also shrinks the size of the safety system and enables valuable space within the machine and the valve island to be used for other purposes.

For most OEMs, designing multi-zoned safety circuits with a zoned safety valve island should be a familiar and user-friendly experience. Only the ability to redundantly remove power and pilot air to the safety system valves has been added. For equipment owners and operators, zoned safety can simplify and reduce cost while optimising the safety of their machines. Best of all,

Continued on page 56
productivity and asset availability can be improved, since the user does not have to shut down the entire machine when safety circuits are enabled.

Applying zoned safety in an automation workflow
An automated machine can have multiple loading stations. As parts move down the line, an operator adds a stamped metal part to the welded assembly. To avoid injury, the operator should not put his hands into the active loading area. To ensure safety, the operator must walk through a light curtain that disables the power and pilot air (only to the redundant pneumatic valves controlling the moving components in the work station), preventing unwanted motion. He loads the part into a fixture, walks back out through the light curtain, initiates operation, and the machine restarts.

The operator’s safety must be guaranteed while in the loading zones per Machinery Directive 2006/42/EC and the ISO 13849-1 standard. The conventional way to implement a safety function would be to have one valve island dedicated to the safety circuit in the first loading station. Feeding that island would be an expensive redundant safety dump valve. A duplicate valve island and dump valve would be installed for the safety circuits in the second and third loading zones as well.

With a zoned safety approach, a much simpler design is possible that allows safety operation without the need to dump air to the entire island. Three independent zones within a single valve island with zoned safety capability would independently control the safety function in three loading stations.

Conclusion
The implementation of Machinery Directive 2006/42/EC and the ISO 13849-1 standard has put an emphasis on the design and manufacture of safe production equipment. Traditionally, discrete pneumatic safety circuits have been designed using dump valves and other components to achieve diverse redundancy. However, these safety systems are complex, costly, and frequently require the shutdown of the entire production machine.

Zoned safety design is an integrated approach to safety control, whereby multiple independent safety zones can be created within a single pneumatic valve island system. Air and power are disabled only to the components controlling equipment in the operator’s vicinity. The rest of the machine can remain in operation when these safety circuits are enabled.

Zoned safety greatly simplifies safety circuit design and reduces the number of system components. Its use is strongly recommended for any pneumatically controlled production equipment requiring compliance with Machinery Directive 2006/42/EC and the ISO 13849-1 standard.

For more information contact ASCO Numatics, +27 11 796 7600, rfq.asconumatics.za@emerson.com, www.asco.com.

Omniflex’s voice alarms

Alarm overload is an issue most control rooms must deal with on an ongoing basis and relieving the situation is a priority for most process engineering professionals. Much of the burden has been caused by DCS and scada systems delivering too much information to operators who are then under pressure to make decisions and take corrective action.

While it is not disputed that all this information is important to a smooth-running process, it is important to differentiate between the types of information collected by the supervisory systems and to classify alarms requiring action from status information. The role of the alarm system is to prompt operator intervention to act and return the process to optimum levels or to safe conditions.

Critical alarms are often managed with the use of annunciators as a separate layer of plant protection over and above the supervisory system. However, even this methodology does not always reduce the load on operators who are trying to service alarms coming into the control room. Standards like ISA 18.1 and EEMUA 191 Alarm Systems are extremely valuable in rationalising the alarm management process, but they are generic and every plant or process has its own unique issues when it comes to abnormal conditions.

Many schools of thought have sought to relieve the pressure on operators in those cases and they often boil down to differentiating the types of alarm using audio visual stimuli.

An option to rationalise the alarm system into voice alarms broadcast over the PA system, allows busy operators to hear and evaluate the urgency without leaving what they are currently doing. Alarms are voice recorded into WAV files and embedded on the HMI ready to be triggered by the Alarm Marshalling unit which is monitoring the existing alarm systems, which could be a PLC or scada, as well as existing Omniflex Annunciator systems. An alarm banner on the HMI provides further information on the alarm. Unresolved alarms will also flash after a period of time to remind operators of their status and importance. The system provides real benefits to operator efficiency including:

• Customisation of existing alarm systems.
• Reduced operator stress from multiple alarm sources.
• Operators can discriminate the status of alarms more efficiently.
• Critical alarms to have an additional level of differentiation.

For more information contact Ian Loudon, Omniflex Remote Monitoring Specialists, +27 31 207 7466, sales@omniflex.com, www.omniflex.com
AST adds new value to fire suppression in 2019

Moving forward into 2019, Alien Systems & Technologies has put new value added services in place for customers.

New value-added services
Pyroshield IG55 gaseous automatic fire extinguishing systems has unique backup now in a full scale 400 bar production purpose filling plant, which represents a significant investment in the business. In addition continued improvement to to the filling and hydrotest plant allows hydro-testing to an impressive two thousand bars of pressure and provides a cylinder turnaround time of less than 30 minutes to test and fill a Pyroshield cylinder. The filling plant provides customers with the best level of support possible for refills and cylinder testing. Pyroshield IG55 systems are used in key business and industrial infrastructure such as data centres, archive rooms, substations, art galleries and flammable liquid stores.

As part of its ongoing commitment to its customers, AST offers full scale hydrostatic pressure testing of Pyroshield and AST pilot cylinders. This is a health and safety requirement as set out in the Occupational Health and Safety Act – Pressure Equipment Regulations. The purpose is to ensure that all cylinders are fit for purpose by meeting prescribed safety requirements. This routine testing of course adds to the cost of ownership of these kinds of systems. To alleviate this AST has launched its free hydrostatic testing offer. This value add, in turn, reduces the total cost of ownership of a fire suppression system by up to 50% and also reduces turnaround times.

Customers currently benefit by choosing Pyroshield over other systems because it is an inert gas blend that uses two naturally occurring gases mixed together (Argon 50% and Nitrogen 50%). This is unlike other chemical synthetics that are costly to refill and in some cases are even banned in certain regions because of their health risks and the severe effects on the environment in the form of global warming.

Free refills in the event of a fire
Not just limited to free hydrostatic testing, low refilling costs and swift turnaround times for Pyroshield Systems, AST has also taken things one step further: the company now offers free Pyroshield refills in the event of a fire. An example was a recent fire on a mine near Northam, where a substation caught alight and the Pyroshield cylinders were refilled for the customer at no additional cost.

In the event that a critical site requires fire suppression with very short turnaround times, the Pyroshield ‘Quick Fill’ service can deliver turnaround times as low as 30 minutes. AST backs this up with its dedicated Pyroshield cylinder transportation system, which transports cylinders to and from site.

Finally, AST has introduced the Pyroshield Super Lite range of cylinders, which provides customers with lightweight cylinders that reduce loading and increases manoeuvrability. This represents another technological step forward for customers, adding extra new benefits. Compared to other systems that use bulkier cylinders, Pyroshield Systems are now easier to install and service.

Room integrity testing
AST provides room integrity testing as well as fire and smoke sealing for all new Pyroshield Systems installations and guarantees a first-time room integrity test pass provided on protected areas. Room integrity tests are vital to ensure the performance of all gaseous fire extinguishing systems, and many insurance companies as well as fire inspectors insist upon them.

So, the start of 2019 is a good time for business owners to review whether their companies are adequately protected against fire. AST will stand by its systems through high-quality service at the lowest possible cost. Additional benefits are provided through free hydrostatic pressure testing and free Pyroshield refills in the event of a fire, both valid for the lifetime of the systems.

For more information contact Alien Systems & Technologies,
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Thermal imagers are invaluable to troubleshoot electrical equipment, panels and transformers, but electricians and maintenance technicians do not often have access to one when they need it. Comtest now offers the Fluke 279 FC TRMS Thermal Multimeter, which integrates a full-featured digital multimeter with a thermal camera, in one device.

The 279 FC allows technicians to check for hot spots in fuses, wires, insulators, connectors, splices and switches with the imager, and then troubleshoot and analyse issues with the DMM. This combination of two powerful test tools into one, means electricians and technicians need to carry fewer troubleshooting tools.

The thermal multimeter features 15 electrical measurement functions including AC/DC voltage, resistance, continuity, capacitance, diode test, min/max and frequency. The optional iFlex clamp can wrap around conductors and wires in tight, hard-to-reach spaces and expands its measurement capabilities to include AC current up to 2500 A. The large colour LCD screen ensures clear images.

The wireless 279 FC is part of Fluke Connect – a system of wireless test tools that communicate via the Fluke Connect app, or Fluke Connect Assets software, a cloud-based solution that gathers measurements to provide a comprehensive view of critical equipment status – allowing technicians to record and share both thermal images and electrical measurements in real time via smartphones or tablets, and automatically upload info to the cloud. Reports can be created and shared from the job site via email and collaborate in real time with remote colleagues via ShareLive video calls, increasing productivity in the field.

The CAT III 1000 V, CAT IV 600 V safety-rated thermal multimeter has a rechargeable lithium ion battery that lasts up to a full work day (10+ hours) under normal conditions.

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

The VSE150 from ifm electronic is a 6-channel diagnostic system designed to evaluate four dynamic signals (e.g. rotational acceleration) and two analog inputs. The new VSE15x family provides different fieldbus interfaces to exchange data with a PLC. This makes it possible to display the measuring values directly on the control system and optimally adapt the monitoring functions to the operating states and processes of the machine. In addition to the fieldbus, two fast digital switching outputs are provided for time-critical alarms.

Reduced network complexity saves time and money

The direct PLC connection via fieldbus allows auxiliary parameters (e.g. rotational speed and triggers for operating states), as well as non-critical alarms from condition monitoring to be exchanged over the bus. This not only reduces wiring complexity but also saves the cost of providing the corresponding inputs/outputs on the PLC.

Machines with varying processes, such as machine tools, have high demands on condition monitoring systems. To recognise deterioration in quality at an early stage and avoid scrap, or even damage, a process-dependent detection of even the smallest change is necessary. This can only be achieved by interlinking the operating parameters (e.g. rotational speed, power consumption, feed rate, tool etc.) and the vibration data – ideally in the PLC. This combination of control and condition monitoring data enables process-dependent monitoring, leading to a considerable increase in quality and process reliability. The same applies to diagnosis (rolling-element bearing condition, ball screw, unbalance), where, in many cases, a high degree of diagnostic validity can only achieved by combining the vibration monitoring data with the machine/process parameters of the PLC.

Influencing process factors must be minimised and the measured data evaluated systematically. Here, too, integrating condition monitoring with the PLC is an enormous advantage and a direct fieldbus connection provides the optimal solution.

Rapid response protects machinery

If machine protection is part of the monitoring concept, a fast response is critical to minimise potential damage. For time-critical alarms, the diagnostic electronics provides two additional digital outputs with a response time of 1 ms, which can be used to initiate an immediate machine stop to minimise, or even completely avoid, consequential damage.

For more information contact ifm electronic SA, 086 143 6772, info.za@ifm.com, www.ifm.com
Safety has top priority wherever flammable media are used in industry. This applies in particular to the chemical industry, where flammable liquids are produced, processed and transported by pumps in hazardous areas. If the pumps start to run dry, hazardous conditions may arise inside and outside the pumps, such as air-gas mixtures, sparking and high temperatures caused by friction. The power consumption of electrically-driven centrifugal pumps falls in the event of dry running, so Simocode pro switches the pumps off when consumption falls below a minimum value. This eliminates the installation of conventional monitoring devices, such as level sensors. The Simocode pro motor management system offers comprehensive protection, monitoring and control functions for the safe disconnection of motors, integration in process control systems, such as Simatic PCS 7, and a large number of interfaces for system-wide communication. Simocode pro makes detailed operating, service and diagnostic data, as well as process and measured values available to higher-level systems and cloud solutions.

Extended to hazardous areas
A new type of detection technology was recently introduced by Siemens to protect centrifugal pumps in hazardous areas from dry running. For this purpose, the company developed special current/voltage detection modules for its Simocode pro motor management system. The principles and practical applicability of this technology have been investigated within the scope of a research cooperation project with the Physikalisch-Technische Bundesanstalt (National Metrology Institute of Germany) in order for it to be certified as an ignition source monitoring device corresponding to a type b1 ignition protection system, according to ATEX and IEC Ex.

Simocode pro uses measuring modules to monitor the active electric power consumption of the pump motor to detect a diminishing flow rate and shut off the pump in good time at defined limit values to prevent impending dry running. Additional sensor technology otherwise required to monitor the pump for dry running can be eliminated. A menu-guided teach-in procedure in the engineering software helps the user to set the limit values. The advantages of the new type of active power-based dry running protection from Siemens are not only less hardware, early detection of faults and the avoidance of damage to the pump, but also safe, reliable explosion protection, savings in time and money spent on maintenance, as well as higher system availability and economic efficiency.

For more information contact David Moela, Siemens Digital Factory and Process Industries and Drives, +27 11 652 2795, david.moela@siemens.com, www.siemens.co.za

Pressure calibrator with electric pump

WIKA has expanded its range of portable calibrators to include an instrument with integrated electric pressure pump. The new model CPH7650 pressure calibrator – supplied in a robust case – is multi-functional and also fulfils test tasks for the measurement parameters of voltage and current.

As a reference, the calibrator uses the proven model CPT6000 sensor with an accuracy of 0,025% FS. The sensor is exchangeable, which increases the versatility of the instrument and optimises recalibration.

With the electric pump, users can generate a test pressure of 0,85-20 bar on site, and control it precisely at the touch of a button. Pump power is continuously adjustable and like the CPH7000 hand-held model (with mechanical pressure pump), the CPH7650 has an electrical module for measuring voltage (0-30 VDC) and current (4-20 mA), as well as supplying power to test items. All pressure and electrical values are simultaneously shown in the display and read via a USB interface.

For more information contact WIKA Instruments, +27 11 621 0000, sales.za@wika.com, www.wika.co.za.
RS Components has launched a comprehensive range of RS Pro LED lighting products for use in a range of energy-saving options including torches and inspection lights, high-bay lighting, ceiling panels, battens and floodlights. The torches and inspection-lights are targeted at maintenance engineers and range from handheld and head-worn torches to inspection lights that come with magnetic bases for hands-free operation. All the devices are chargeable via USB, offer light intensities from 250 to 1400 lumens, and come in a gunmetal grey and red finish.

Aimed at deployment in educational establishments, retail stores and warehouses, the RS Pro high-bay lighting options include 100, 150 and 200 W versions. Features include a 90-degree beam angle, 4000K colour temperature and a CRI of greater than 70. Pre-wired with a 2-metre power cable and housed in black aluminium with a tempered glass cover, the lights are IP65-rated and come with an adjustable daylight/ON sensor and an optional plug-in microwave sensor accessory for movement detection.

Beneficial in offices, warehouses and healthcare facilities, the LED ceiling panels are 600 x 600 mm 36 W lights and offer a choice of 4000K or 6000K colour temperatures. The panels are IP40-rated and an optional battery-backup emergency kit is available separately. The LED lighting battens are designed to replace standard fluorescent fittings and offer 2-, 4- and 5-foot options with a beam angle of 120 degrees and a colour temperature of 5700K. These vapour-proof, IP65- and IK08-rated, grey-coloured LED battens target use in offices, warehouses and car parks.

Lastly, the LED floodlight range is suitable for office and warehouse applications and features include IP65 and IK08 ratings, cool-white 4000K colour temperature and toughened glass housings. Devices are available with or without PIR sensors.

For more information contact RS Components SA, +27 11 691 9300, sales.za@rs-components.com, www.rsonline.co.za.
Your **Training** partner in **Condition Monitoring** Since 1986

The Vibration Institute of South Africa (V.I.S.A.) was formed in 1986. Over the years the institute has held numerous very successful training courses in Johannesburg, Durban and Cape Town, with well over 6000 participants from all over the world. V.I.S.A.'s courses are presented by V.I.S.A.'s own lecturers as well as by local and overseas guest lecturers, bringing many years of combined experience to the classroom. The courses are held at professional training venues or Smaller, tailor-made, in-house courses can be held at your own plant. V.I.S.A.'s programme focuses on machine-Condition Monitoring and Asset optimization through courses such as Vibration Analysis, Electric Motor Diagnostics, Alignment, Balancing, Lubrication Analysis, Data Collection & Analysis, Transient Data and Modal Analysis. V.I.S.A.'s training vision is to equip our participants with the necessary insight and skills to be proficient and successful in the world of Reliability and Condition Monitoring.

**Category 1 - ISO Vibration Analyst Course**

The Vibration Analyst Introduction course is intended for newcomers or for personnel who have limited vibration analysis experience. The course focuses on periodic, single channel data collection and analysis for predictive maintenance programmes. A foundation is established for in-depth understanding of spectrum and waveform relationships. Review of condition monitoring technologies - Vibration, oil, wear particle, infrared, acoustic emission, electric motor testing. Review of failure modes and appropriate use of condition monitoring technologies.

**Category 2 - ISO Vibration Analyst Course**

The Vibration Analyst Intermediate course is intended for personnel who have at least twelve months vibration analysis experience and a thorough understanding of vibration theory and terminology. The course provides an in-depth study of machinery faults and their associated spectrum, time waveform and phase characteristics. Additional topics covered include: signal processing, data collection and corrective actions.

**Category 3 - ISO Vibration Analyst Course**

The Vibration Specialist Advanced course is intended for personnel who have at least 5 years vibration analysis experience and a thorough understanding of vibration theory and terminology. The course provides an in-depth study of diagnostic measurement techniques and the associated applications of the techniques.

**Any Questions?**

Contact Marise Diedericks +27 (0)11 249 6752  
Alternatively email her on: marise.diedericks@aveng-acs.com  
Mail: rfq@aveng-acs.com

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**AVENg ACS**

Complete Process Control Solutions and Services Provider
**Wireless kit simplifies rotating equipment monitoring**

Banner’s new Wireless Solutions Kit for vibration monitoring is a fully integrated and easy-to-use solution for monitoring assets with rotating motion. It is designed to make it easy for users of any experience level to setup a wireless network, establish performance baselines and thresholds, and collect data from motors, fans, pumps, compressors, and similar equipment.

**Key benefits**

- **Reduce downtime and increase productivity:** avoid unexpected downtime and make more informed decisions about maintenance schedules by detecting problems early before a failure can occur.
- **Simple setup:** plug in the box, bind the nodes through the HMI screen, install vibration sensors and nodes on the equipment, and start collecting data. Performance baselines and thresholds are automatically generated and no programming is required.
- **Visualise data and alarms:** HMI clearly displays alarms and graphs of raw vibration data along with baseline, warning and alarm values.
- **Local and remote monitoring:** access raw data right on the HMI or via the cloud from any network accessible location.
- **Scalable solution:** monitor and collect data from up to 16 assets.

**Wireless Solutions Kits for vibration monitoring can be used with virtually any machine with rotating motion. These kits help users to:**

- Identify machine performance issues caused by misalignment, unbalance, bearing failures, pump cavitation, blade damage, etc.
- Identify equipment requiring full spectrum analysis.
- Establish more strategic scheduling of equipment maintenance

https://www.youtube.com/watch?v=id0-qrhviso.

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

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**Versatile wireless telemetry solutions**

Novus’ FieldLogger is a versatile, powerful and cost-effective data logger handling analog, digital and other types of variable with high resolution and speed. It is a high-performance and high-connectivity piece of equipment, which is easy to configure and operate.

As it has multiple analog inputs, FieldLogger’s scope of operation is greatly increased when used with other equipment, such as HMI Remote Mounting Kit; the multifunctional wireless gateway AirGate Modbus; the RHT-Air wireless transmitter, which, when coupled with AirGate Modbus, provides an excellent solution for wireless monitoring of temperature and relative humidity variables; and the AirGate 3G which, when applied in M2M communication, enables a Modbus RTU network to be monitored by more than one master.

Novus field logger has eight configurable analog inputs that can read thermocouple, Pt100, Pt1000, voltage and current signals. It also has two relay outputs and eight digital ports individually configurable as inputs or outputs. The RS-485 interface can operate as a Modbus RTU master or slave. As a master, it can read and log up to 64 external channels. It also has a 10/100 Mbps Ethernet interface that allows access through a browser (HTTP), FTP (client and server), email sending (SMTP), SNMP and Modbus TCP.

FieldLogger is equipped with one USB interface to be connected to a computer for configuration monitoring and data download. The other USB port is for plugging a flash driver for data retrieval. The 512 Kbit logging memory is used to store data and this can be expanded via an SD card.

For more information contact Carric Shepherd, Mimic Group, +27 11 689 5710, carricmimic@gmail.com, www.mimic.co.za
Digitalisation is changing industries and opening up new possibilities. We now have a wealth of information from a multitude of sources at our fingertips. But is it reliable? Having fast access to a trustworthy source for product details and services is the key to success. SKF’s new Shelf app offers just that.

The newly-updated app delivers easier access to content such as product brochures, data sheets, technical articles, and more. Documents are pre-sorted into categories, and users can use the search function to find the information they are looking for much faster. Information in the Shelf app is regularly updated so readers can be sure they have the latest and most accurate data on SKF products and services.

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

Personalised, portable content with SKF Shelf app

Quad port USB 3.0 host adaptor

EKF has introduced the EB3-Tone, a peripheral slot board for CompactPCI Express and PXI Express systems, equipped with a quad port USB 3.0 host controller requirement.

All four USB connectors are available from the front panel for attachment of external USB devices.

The card is based on PCI Express and requires a single Gen2 lane for full USB performance. The front panel USB 3.0 type A host connectors are protected by electronic power switches and can deliver up to 1.5 A (Vbus 5 V).

Other features include:
- PCIe x1 upstream – Gen2 (5.0 Gbps).
- PCI Express x1 Gen2 interface.
- USB 3.0 xHCI (eXtensible host controller interface) SuperSpeed supported.
- USB 2.0 high-speed, full-speed and low-speed all supported.

For more information contact Rugged Interconnect Technologies, +27 21 975 8894, sales@ri-tech.co.za, www.ri-tech.co.za.

Suitable for a wide range of applications such as time control, position indication, control of rotation speed and batch counting, the Hengstler Tico 772 multifunctional counter is extremely easy to use. Available from Countapulse Controls, this electronic preset counter has been engineered for simplicity as well as reliable operation and allows use by more than one individual.

The robust housing incorporates an easy-to-read display with large digits (48 mm x 48 mm in size) as well as four large buttons to facilitate all configuration adjustment. The counter is easy to program and has three preset options. This simplification of handling also extends to the installation of the unit, which is via pluggable terminals.

The Hengstler Tico 772 is suitable for use in ambient temperatures up to 50°C, is ingress protected to IP65, and is both shock and vibration resistant. Input frequency is up to 60 kHz and signal times are programmable for up to 10 minutes.

For more information contact Gerry Bryant, Countapulse Controls, +27 11 615 7556, bryant@countapulse.co.za, www.countapulse.co.za.

Multifunction counter is simple and reliable
**Compact contactor solutions**

Engineered to provide a compact contactor solution, the WEG CWB range of devices offers a width space saving of up to 18%. Developed in two frame sizes, the contactors meet a range of industrial and domestic application requirements. The first contactor in the range, covering up to 38 A, has a width of only 45 mm while the second contactor, ranging from 40 to 80 A, has a width of 54 mm. Two mounting options, standard DIN rail or oblong mounting holes makes interchangeability easy.

Significantly, the space saving allows the use six contactors where previously only five could be used. Another innovative engineering feature is the use of WEG’s Zero-Width mechanical interlocking system. Traditionally contactors use a mechanical interlock device which is external to the contactor. The Zero-Width system facilitates quick and easy mechanical interlocking between contactors, without the need for tools. In addition, this feature allows the user to build a reversing starter up to 38 A with a total width of only 90 mm.

Built-in front auxiliary contacts not only enhance the space saving benefit, but also eliminate the need to purchase additional auxiliary contacts. This feature also offers greater flexibility as it facilitates optimisation of the internal space in electrical panels.

In another innovation, the contactors have been engineered with integral surge suppressor blocks without increasing the physical size of the devices. This limits undesired interference which could be caused during the opening of the contactor coils and allows for the front mount surge suppressor to be easily removed without the use of special tools.

Energy saving is achieved through the low consumption of the coils, which allows direct switching from PLCs without the need for interface relays. This facilitates both space and cost savings for the end-user.

Available at competitive pricing from Zest WEG Group’s branches and national distributor network, the WEG CWB range of contactors affords customers a high level of flexibility.

**RS Components expands current transformer range**

RS Components has announced availability of a range of RS Pro current transformers targeting a wide range of applications including process control, motor control, utility power monitoring, control panels, switchgear used in generators and electrical power distribution systems, as well as in energy and building management systems.

Current transformers are widely used in a range of electrical power applications for the measurement and handling of AC currents. High circuit currents – or primary currents – are transformed to a significantly reduced secondary current, enabling connection to measurement and recording instruments. Current transformers will also isolate these instruments from high voltages in monitored circuits.

The range offers Class 1 accuracy of 1% at rated current and covers devices with primary current handling from 5 to 3000 A. Key features include sealable terminal covers and availability of various case sizes and mounting options, including wall, cable, busbar and DIN-rail mounting. Meeting UL94V0 approvals, devices in the range are supplied in moulded cases made from flame-retardant polycarbonate materials.

**For more information contact**

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

**SY8-Cyclone CompactPCI serial board**

The SY8-Cyclone is a CompactPCI serial peripheral board, equipped with a powerful FPGA, and up to ten RJ45 connectors for 100BASE-TX Ethernet. With its PCI Express x4 interface, the Cyclone-V FPGA can be used as an Ethernet NIC, switch, router or gateway.

Industrial Ethernet real-time protocols and custom-specific applications may be integrated.

The 4HP front panel width solution provides five RJ45 connectors. As an option, the board is available with ten Ethernet ports in the 8HP width front panel. A reference design based on Quartus is available as starting point for customers. The circuitry operates over the industrial temperature range and contains logic elements, as well as hard IPs for the PCI Express controller. In addition to non-volatile I2C memory, 512 MB DDR3L soldered RAM is wired on board. As an option, the card can accommodate a mezzanine module with an identical secondary FPGA. This allows either safety-critical applications by redundancy, or additional logic elements for custom specific solutions.

**For more information contact**

Rugged Interconnect Technologies, +27 21 975 8894, sales@ri-tech.co.za, www.ri-tech.co.za.
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