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OUR COVER 20

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Rockwell Automation delivers technology and more at Houston Fair

When Rockwell Automation CEO Blake Moret addressed the media at the opening press event of the 2017 Automation Fair in Houston, Texas, he chose not to dwell on annual reports or the recent run-up in the company's stock price. Instead, it was refreshing to hear him speak of how the organisation's future efforts will focus on skills development and productivity, as well as Rockwell Automation's commitment to recovery efforts in the Houston area after the recent devastation caused by Hurricane Harvey.

Moret stressed the need to connect industries through the digital technologies of the IIoT and the importance of a workforce empowered with the appropriate skills to achieve this.

Among the technology highlights, Frank Kulaszewicz, senior VP Architecture & Software, Rockwell Automation, explained that the company will concentrate its investment on digital design and digital operations – the fundamental building blocks of what industry has christened the ‘digital twin’. The twin is a mixed reality solution that allows engineers to bring a new machine (or even an entire plant) to life digitally, even before any physical construction actually exists. It is an extremely powerful idea that delegates were able to experience firsthand at the Innovations booth in the show area. One simply dons a Microsoft HoloLens headset and the Rockwell Automation Studio 5000 Application Code Manager does the rest. It is a surreal experience to be shown the features of a packaging machine that was not there moments before, and vanishes again as soon as the headset is removed. It allows new designs or modifications to be tested and debugged using technologies that are every bit as cool as anything the gaming industry has to offer. It also has applications in training, and the possibilities for new product demonstrations are unlimited.

Speaking of new products, Automation Fair took the opportunity to introduce delegates to the latest addition of the FactoryTalk analytics platform. Project Scio is the next step in advanced analytics for manufacturing, which automates the value-extraction process from production data without the need for any special expertise. Any authorised user can now access any existing data source and create actionable analytics in the form of personalised ‘storyboards’, which can be shared across the enterprise. Add device auto-discovery and flexible machine-learning algorithms to this open architecture solution and the result is an impressive tool that elevates the plant operator to the level of a data scientist able to drive profitable business outcomes. In addition to the platform solution, Rockwell Automation also offers a range of connected services to provide customers with a secure network infrastructure. What Moret described as: “All the tools to provide users at different levels in an organisation the information they need to influence profitable operations.”

In terms of developing these digital-savvy operators of the future, Rockwell Automation, together with its partner ManpowerGroup, had this covered as well. ManpowerGroup VP Chris Layden explained how many US military veterans already possess an advanced technical skill-set that can easily be realigned to suit the needs of the manufacturing industry. To this end, the companies have launched a 12-week programme at the Academy of Advanced Manufacturing. A few of the graduates of the inaugural course were on hand to share their experiences during one of the most interesting panel discussions I have ever witnessed at an automation conference. The discipline and team-oriented mindset of these veterans is every employer’s dream, and I was left to wonder if it might be possible to achieve something similar in South Africa.

Automation Fair 2017 was a slickly organised event that exceeded all expectations – 9 500 visitors on the first day alone bear testament to this. What set it apart though was not just the impressive variety of new-age manufacturing technology on display. As part of the relief efforts in the aftermath of the recent flooding, the organisers joined forces with United Way to distribute over 8 000 thanksgiving dinner kits to stricken residents in the area. Last November in Houston, Rockwell Automation and its Partner Network showed that they were prepared to deliver more than just technology, and that was good to see.

Interested readers can find the official conference press report on page 6 and more on the veterans programme on page 4.

Steven
Editor: SA Instrumentation & Control
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ManpowerGroup and Rockwell Automation recently celebrated the first military veterans to graduate from the Academy of Advanced Manufacturing and secure high-paying jobs in the rapidly-evolving manufacturing industry.

The 12-week programme launched in August combines classroom learning with hands-on laboratory experience. Veterans are trained in Rockwell Automation’s state-of-the-art facility in Mayfield Heights, Ohio for in-demand jobs in advanced manufacturing. The programme expands Rockwell Automation’s long-standing engineer in training programme, which combines classroom learning with hands-on laboratory experience, producing hundreds of graduates annually. It also adds to the number of programmes ManpowerGroup provides for military personnel, veterans and spouses.

“In recognition of Veterans Day, on behalf of Rockwell and ManpowerGroup, we thank all our veterans for their service,” said Blake Moret, CEO of Rockwell Automation. “We are honoured to recognise our first military veterans to graduate the Academy of Advanced Manufacturing. We’ve seen their unique combination of core work and tech-savvy skills evolve to position them for careers in the industry. We are confident this programme will help solve a challenge critical to the growth of advanced manufacturing.”

ON Power, a part of Reykjavik Energy, has signed a contract with ABB for the delivery and installation of 15 Terra multi-standard DC chargers at various points along Iceland’s main highway.

Today there are over 1400 electric vehicles on the road in Iceland, partly due to a state-financed incentive programme that supports the purchase of electric vehicles. The tender for fast chargers is part of the country’s campaign to promote and expand Iceland’s e-mobility strategy by increasing the availability of flexible and robust charging stations along central locations of the national highway across the entire country.

The specified fast charger can charge an electric vehicle in 15-30 minutes, featuring easy to read touch screen displays and graphic visualisation, together with low operational noise. All chargers can be combined with comprehensive solutions for user authorisation, payment and network connectivity.

ABB boosts Iceland’s electric vehicle infrastructure with 15 new fast chargers

The American Automobile Association, in partnership with Keolis, a world leader in public transport operations, announced bringing the future of transportation to America by sponsoring the nation’s first self-driving shuttle pilot project geared specifically for the public. Over the course of a year, the self-driving shuttle aims to provide the quarter-million residents and visitors of Las Vegas with first-hand experience using autonomous vehicle technology. This will be the first self-driving vehicle to be fully integrated with the city’s traffic infrastructure.

In addition to studying how the shuttle interacts in a live traffic environment, AAA will survey riders in order to understand why a large percentage of consumers remain wary of driverless technology, and whether a personal experience changes their perception.

First autonomous shuttle in downtown Las Vegas

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New Automation Technology

BECKHOFF
Thousands convene in Houston to learn about the latest automation technology

Thousands of industrial professionals recently convened in Houston for the Automation Fair event to learn more about the latest advanced manufacturing technologies shaping the industry, and the automation tools that can help them be more globally competitive and productive. Hosted by Rockwell Automation and its Partner Network members, the Automation Fair is a premier industry experience uniquely designed to help manufacturers and OEMs optimise their automation investments to achieve their business goals.

“This week is about showcasing technologies and information that help make industrial companies and their people more productive,” said Blake Moret, president and CEO, Rockwell Automation. “We are also taking the opportunity to show our support for the people of Houston and surrounding communities as they continue to rebuild and recover from the recent hurricanes.”

At the event, attendees were exposed to a variety of technologies that help support digital transformation — using production data to improve business outcomes — and best practices for monitoring and managing operations to increase integration and collaboration across the enterprise. To this end, Rockwell Automation has again expanded its analytics offering, with a new platform that pulls data from virtually any source in the enterprise, and delivers analytics in intuitive dashboards, helping users rapidly resolve issues and drive tangible business outcomes across the Connected Enterprise.

On the opening day, global media and industry analysts attended the Automation Perspectives forum. At this event, executive leadership and industry experts shared their vision on ways companies are realising value from digital transformation across industries, and the technologies being used to achieve this. Industry leaders also shared their strategies for addressing the manufacturing skills shortage, with a new programme developed jointly by Rockwell Automation and ManpowerGroup that taps into the talents and skills of US military veterans to help solve this critical challenge.

In conjunction with the Automation Fair event, employees, partners and customers of Rockwell Automation joined forces with United Way to help pack over 8 000 Thanksgiving dinner kits, part of the company’s ongoing effort to support hurricane recovery efforts, and build on its commitment to Houston.

The 2017 Automation Fair featured more than 140 exhibits showcasing the latest innovations in automation. It also included nine industry forums, 19 hands-on labs and 93 technical sessions designed to expand attendee knowledge and use of the latest control, power and information technologies.

For more information contact Michelle Junius, Rockwell Automation, +27 (0)11 654 9700, mjunius@ra.rockwell.com, www.rockwellautomation.co.za

Endress+Hauser inaugurates new campus in Lyon

Endress+Hauser has invested €4.9 million in a new building in Lyon, France. As well as 25 sales and service employees from Endress+Hauser, nine employees from the European headquarters of Kaiser Optical Systems will move into the new facility.

“The new building offers modern offices for our employees and abundant space for customer training,” says Laurent Mulley, managing director of Endress+Hauser France, who is delighted with the new facility. “At the same time we are bringing together Endress+Hauser’s process control technology and the advanced analysis processes of Kaiser Optical Systems under a single roof. We are thus laying a foundation that will allow us to strengthen our presence in the French market over the long term.”

Investment for collaboration

“One of the cornerstones of our strategy is to one day support our customers’ laboratory and process control applications,” explained Matthias Altendorf, CEO of the Endress+Hauser Group. “Having Endress+Hauser and Kaiser Optical Systems in proximity in Lyon illustrates the progress we are making in this regard. Expanding the business in the area of process control and laboratory analysis reflects the wishes of many customers for enhanced quality parameter measurements.”

The new energy-efficient office building is located near Lyon–Bron airport, in one of the fastest-growing business regions in France.
**News & Events**

The Hytec Group has become South Africa’s first company to receive full accreditation as a training provider to qualify fluid power fitters. The company received full accreditation with programme approval from the MerSETA to provide theoretical and practical training for the National Certificate Mechanical Engineering: Fitting (Fluid Power); and the National Certificate Mechanical Engineering: Fitting (Manufacturing, Engineering and Related Industries), both at NQF level II.

There are currently four learners undergoing training at Hytec who, once qualified, will be the first certified fluid power fitters in South Africa trained by a South African training provider. “This is an achievement that the South African fluid power industry has been striving to achieve since 2009 when the qualification was originally registered with SAQA,” says group training manager, Allen van Gent. “The importance of the certification cannot be underestimated. There are numerous mechanical fitters with hydraulics industry experience and now they can receive formal recognition. The scope of training encompasses everything that a fluid power fitter needs to know in order to conduct his day-to-day activities. It is believed that qualified fluid power fitters will save their companies or clients hours in downtime and reduce their spare parts expenditure.”

Currently Hytec’s training facilities provide for theoretical and practical learning of 36 learners. However, once housed in the new Hytec facility due to open in 2018, three dedicated training rooms will be able to accommodate a combined capacity of 120 people. Another part of the learning experience will be a state-of-the-art WS290 hydraulic and pneumatic training workstation donated by Bosch Rexroth Germany. The hydraulic power unit, with a loud sensing double pump, can accommodate four to six trainees simultaneously.

For more information contact Allen van Gent, Hytec, +27 (0)11 978 4630, allen.vangent@hyhold.co.za, www.hytcegroup.co.za

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**Bosch Projects upgrades shiploaders at Durban harbour**

Bosch Projects recently completed the upgrade of two shiploaders at Durban harbour, which have been used for over fifty years to load sugar onto vessels at the South African Sugar Association’s iconic terminal. The two loaders, commissioned in 1965 by Moreland Technical & Engineering Consultants, needed to be refurbished in line with Transnet’s upgrade of berths at Maydon Wharf.

“The original 850 tph shiploaders were designed to feed onto 35 000 ton Handymax vessels, but with upgrades at the port, designed to allow for a deeper draft and the berthing of 80 000 ton Panamax vessels, modernisation of these machines was critical if they were to remain in operation,” explains Dave Chappelow, sector director: industrial, Bosch Projects. “Thorough inspections of these robust shiploaders indicated that in spite of many years of operation in aggressive seaside conditions, they were in good overall condition, with no excessive corrosion or evidence of fatigue.

“The most cost effective solution was to restore and incorporate them into a new substructure that could utilise a modern cope quayside rail. The reconfigured substructure provides the shiploaders’ existing booms sufficient access and clearance to service Panamax type vessels, even at the highest tides.

“Bosch Projects, in conjunction with contractors, Bayside Engineering, commenced onsite modifications in August 2016 to coincide with construction of the quay modifications. In spite of challenges, which included inclement coastal weather conditions and hot works restrictions imposed when vessels containing flammable goods were docked at the berth, timeous commissioning of the refurbished shiploaders took place a year later.”

Restoration also involved on and off-site conveyor belt splicing, surface preparation and painting of selected existing steelwork, as well as the replacement of the cladding where necessary.

Apart from providing specialist services to ports and terminals, Bosch Projects offers solutions to sugar and ethanol engineering, water and waste water, energy and industrial plants, roads, land and building developments.

For more information contact Dave Chappelow, Bosch Projects, +27 (0)31 535 6000, chappelowd@boschprojects.co.za, www.boschholdings.co.za

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**Hytec engineers a new qualification**

The Hytec Group has become South Africa’s first company to receive full accreditation as a training provider to qualify fluid power fitters. The company received full accreditation with programme approval from the MerSETA to provide theoretical and practical training for the National Certificate Mechanical Engineering: Fitting (Fluid Power); and the National Certificate Mechanical Engineering: Fitting (Manufacturing, Engineering and Related Industries), both at NQF level II.

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For more information contact Allen van Gent, Hytec, +27 (0)11 978 4630, allen.vangent@hyhold.co.za, www.hytcegroup.co.za
At the ninth annual conference of the Manufacturing Enterprise Solutions Association (MESA) held recently at the Black Eagle conference centre, the theme was manufacturing solutions for the digital revolution: Big MOM, big data, big results. Once again the conference hosted an array of top drawer speakers and delegates who were able to enjoy great networking opportunities as well as keeping up with the latest developments in the field. They were presented with a wide mix of new technologies and new ideas and their practical application in interesting case studies in top companies such as Lonmin, Namibia Breweries, Aerosud and Hulamin. Some examples were the use of digital twinning for proof of concept in an Aerosud project and the deployment of mobile apps and machine learning models to generate an extra R195 000 per annum in revenue on a Lonmin concentrator plant. Sponsors included Esteq, Bytes Technology, Wonderware, Schneider Electric, AM2 Systems, GE, J5 International, GE, Iworx, MES, SAIMC, AdaptIT, OSIsoft and Pimsoft.

The highlight of the conference was the presentation by quantum biology researcher, Dr Adriana Marais, who is on the shortlist to go to Mars on the Mars One project – the adventure of the century. She believes that exploration drives innovation and she had the audience spellbound with her vision of life on Mars and the potential for this project to generate new technologies which could benefit people on earth.

For more information contact Daniel Spies, MESA Africa, +27 (0)83 666 6854, chairman@mesa-africa.org, www.mesa-africa.org

Award-winning South African Internet of Things company IoT.nxt will introduce the US tech market to its ground-breaking technology and solutions for the Industrial Internet of Things at the IoT Tech Expo North America on 29 November 2017, at the Santa Clara Convention Centre, Silicon Valley.

“We are excited to bring our world-leading technology and platform solution to the US market,” says global director of partnerships Gareth Rees, team leader for the company’s participation at the expo. “Recent trips to the US have validated our cutting-edge approach and seamless edge device interoperability with the ability to retrofit to any existing equipment, coupled with powerful edge data processing and secure two-way messaging to the cloud.”

Rees will be joined by CTO Bertus Jacobs, Rudi du Toit, head of research and development for the field gateway device known as Raptor, and Michiel du Toit, head of the IoT.nxt platform development. Together they will present IoT.nxt’s software and hardware offering, which allows companies to implement IoT solutions without having to replace existing infrastructure, or implement completely new software. “We have pioneered an agile, application-agnostic platform that leverages the core principles of the IoT,” adds Rees. “We have bridged the challenges of Big Data and the end-to-end flow of this from edge to ERP,” adds Rees.

IoT.nxt’s participation at this global event was made possible after the company was crowned the overall winner at the 2017 MTN Business IoT Award event hosted in Sandton earlier this year. As part of the prize, the company was afforded the opportunity to present its technology at an international IoT event.

The North American Expo is part of the world’s largest IoT event series and runs with the 2017 Blockchain Expo and the 2017 AI Expo North America. Speakers include luminaries like Lionel Chocron, VP industry and IoT solutions at Oracle, Maciej Kranz, VP strategic innovation at Cisco, as well as experts from global giants like Shell, Toyota, Visa, Mastercard, ON Semiconductor and many others.

IoT.nxt opened its first international office in The Hague in The Netherlands in September and has its sights set on the US market. CEO, Nico Steyn and chairman, Wayne Fitzjohn recently visited several large companies in the region to explore possibilities, and they have reported that the feedback has been tremendous and confirms the value of the IoT.nxt offering.

For more information contact Daleen van Wyk, IoT.nxt, +27 (0)83 302 0827, daleen.vanwyk@iotnxt.com, www.iotnxt.com
NEWS & EVENTS

Saaris in South Africa – a promising entry into African markets

Members of the Saaris community (Saarland, innovation & standards), a regional German development agency supported and funded by the Saarland government, visited South Africa on a five-day visit to improve its competitiveness and strengthen local ties within the sub-Saharan economy.

SICK Automation South Africa hosted the delegates on the first day, where they met with national product manager Mark Madeley, also a former graduate of The German Society for International Co-operation program (GIZ). GIZ supports people in acquiring specialist knowledge, skills and management expertise.

“The objective of the Saaris delegation was to meet strategic companies and industry specific customers in order to gain a better business understanding of local market needs, investment opportunities, as well as forge relationships and share ideas through networking opportunities,” explains Madeley.

“South Africa is an important economic engine within Africa, especially with its diverse industries and Special Economic Zones (SEZ), like in the automotive sector, for example. These sector-specific economic zones provide investors with attractive tax benefits and investment incentives whilst giving structured access to local supply chains,” he adds.

The range of services provided by Saaris include vocational training programmes for skilled members of staff and executives, offering technical and business management advice to companies as well as activities for the development of new sales markets in Germany and abroad.

The registered association also focuses on promoting innovation and technology, the securing and acquisition of skilled labour as well as on providing consultancy services to companies with a view on technological and demographic change.

For more information contact Mark Madeley, SICK Automation South Africa, +27 (0)11 472 3733, mark.madeley@sickautomation.co.za, www.sickautomation.co.za

M&C refurbish massive mill motor for Zimbabwe gold mine

The largest AC electric motor operating in Zimbabwe drives a reduction mill, and this synchronous motor was recently refurbished by leading rotating machinery repairer, Marthinusen & Coutts.

Estimated to be around 30 years old, the 2150 kW motor, in operation at Freda Rebecca Gold Mine, suffered a catastrophic failure caused by age related metal fatigue. The main hub of the electrical rotor component had sheared off.

Following preliminary repair work undertaken by the mine, Marthinusen & Coutts was called to site to investigate further and provide a permanent solution. A full assessment undertaken by the team resulted in the motor being brought back to the division’s facility in South Africa.

It was decided, following negotiations with the mine, to do a design modification instead of replacing the hub. Richard Botton, divisional CEO Marthinusen & Coutts, explains that this option was chosen as it would save costs and reduce the lead time without sacrificing the performance of the refurbished motor.

“Our team’s extensive experience and understanding of large rotating machinery enabled us to offer an alternative to the mine that would ensure optimum reliability going forward,” he explains. “One of the solutions was to use the existing rotor superstructure with a bolt-on hub on the motor.”

In addition, 18 main pole coils were replaced. These were manufactured by Marthinusen & Coutts at its ISO 9001 accredited facility in Gauteng.

A complete rewind of the stator was necessary due to the extensive damage caused during the failure. Fortunately, the mine store had a spare set of coils, manufactured 20 years ago, and these were rewound in South Africa.

A complete upgrade and modification to the sleeve bearings also brought these back to OEM specifications.

“The ability to implement enhancements during the repair of rotating machinery such as this motor is a major advantage to the mine as it allows for the latest technology and enhancements to be included in the final product solution,” concludes Botton.

The scope of work included the onsite commissioning of the motor which was facilitated by the Zimbabwe operation with technical support from the division’s centre of excellence in Johannesburg.

For more information contact Richard Botton, Marthinusen & Coutts, +27 (0)11 607 1700, richardb@mandc.co.za, www.mandc.co.za

Mark Madeley (second from left) and the international delegation pictured at the new offices of SICK Automation South Africa.

For more information contact Richard Botton, Marthinusen & Coutts, +27 (0)11 607 1700, richardb@mandc.co.za, www.mandc.co.za
**BECKHOFF**

Who will benefit from this training? Automation Engineers

TwinCAT 3/TwinCAT 2 – Programming, Commissioning & Maintenance
Cape Town 6-8 Feb 2018
Johannesburg 6-8 Feb 2018
Durban 13-15 Feb 2018
Port Elizabeth 13-15 Feb 2018

For more information contact Andrew Reinhold, Beckhoff Automation, +27 (0)11 795 2898, training@beckhoff.co.za, www.beckhoff.co.za

**Endress+Hauser**

Who will benefit from this training? Instrument Technicians and Engineers

TC1001 – Process Measurement and Instrumentation Configuration 1
Sandton 19-23 Feb 2018

TC1002 – Process Measurement and Instrumentation Training Configuration 2
Sandton 26 Feb – 1 Mar 2018

TC1003 – Process Measurement and Instrumentation Training Combined Course
Sandton 19 Feb – 1 Mar 2018

For more information contact Nico Marnewek, +27 (0)11 262 8087, nico.marnewek@za.endress.com, www.za.endress.com

**FESTO**

Who will benefit from this training? Mechatronic Engineers

HY152 – Mobile Hydraulics
Johannesburg – 30 Jan – 2 Feb 2018

PN111 – Pneumatic (1) Basic
Cape Town 7-9 Feb 2018

HY511 – Hydraulics (1) Basic
Durban 7-9 Feb 2018

For more information contact Lucian Kirk, Festo, +27(0)11 971 5626, didactic.za@festo.com, www.festo-didactic.co.za

**SIDX**

Who will benefit from this training? Automation Engineers

PTM – Certified Profibus Installer with Troubleshooting and Maintenance
Johannesburg 21-22 Feb 2018

ASI – AS-i Concept and Implementation Course
Johannesburg 23 Feb 2018

For more information contact Michael Garnham, Industrial Data Xchange, +27 (0)11 548 9960, academy@idx.co.za, www.idx.co.za

**MECOSA**

Mecosa training course for Radiation Protection Officers
Johannesburg 27-28 Feb 2018

For more information contact Michelle Ramphal, Mecosa, +27 (0)11 257 6100, michelle@mecosa.co.za, www.mecosa.co.za

**VEGA**

Who will benefit from this training? Automation Engineers

Processing Solutions for Level, Pressure and Nucleonic
Johannesburg 6-8 Feb 2018

For more information contact Chantal Groom, VEGA Controls SA, +27 (0)11 795 1955, chantal.groom@vega.com, www.vega.com

**SIEMENS**

Who will benefit from this training? Automation Engineers

SD-SIMOPRO – Simocode DP and Pro V
Midrand 5-9 Feb 2018

DR-S12-PM – Sinamics S120 Parameterizing and Commissioning
Midrand 26 Feb – 2 Mar 2018

PI-FLOW – Siemens Flow Instruments Training
Midrand 26 Feb – 2 Mar 2018

For more information contact Vanessa Bonhomme, Siemens Southern Africa, +27 (0)11 652 3206, vanessa.bonhomme@siemens.com, www.sitrain-learning.siemens.com/za

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From the President’s desk

Dear industry colleagues,

Welcome to 2018. Of course as I am writing this it is still 2017 and we are all wondering if there will be an ANC elective conference? Who will be the successor of Jacob Zuma? Will we have a downgrade? What will happen to the Rand? The list goes on . . .

But I am not going to discuss these things. They will of course impact on all of us in different ways, in our private lives and in business, but I would rather focus on what we need to do as automation practitioners as we go into a new year.

In January 2018, all around the world, we are in this next (4th) industrial revolution. One way or another it is going to have an effect on us, and on industry in South Africa and Africa.

It seems to me that there are two prime areas of discussion at the moment. Firstly, what will happen if we fully implement this concept of Industrie 4.0? If we increase automation how many jobs will be lost? And secondly, what will happen if we do not implement Industrie 4.0? If we do not increase our productivity and quality to remain competitive how many businesses will have to close?

These are questions that we truly need to embrace in 2018. We discuss Industrie 4.0 and the Industrial Internet of Things (IIoT) as if they are a science project. There is tremendous interest – projects at universities and the CSIR – but so many in isolation. Universities are really focused on Big Data and analysis, but this is mostly Internet of Things (IoT) and not IIoT. What data does manufacturing really need, where do we get this data, and what should we do with it?

In process automation and manufacturing we need sensors and actuators and we need data communication. Where are we training the skills in South Africa to design and install industrial Ethernet networks? If you open the ceiling or floor in an office building today you will find kilometres of cables connecting desks, printers, telephones and so on – this does not work on a factory floor. What about wireless connection? How will you read the temperature on a rotating kiln?

At the SAIMC through our membership, branches and national coordination, we can offer so much. We have skills in almost every discipline and in every industry. In 2018 we should turn the questions around and ask: What will happen if we fully implement this concept of Industrie 4.0 and increase productivity, efficiency and quality to create globally competitive industries and develop the skills and jobs to implement this, not only in South Africa, but in all of Africa?

Let’s make this our focus in 2018. Whether you are a committee member, or not, whether you are a member of the SAIMC or not, look for opportunities to develop in South Africa. Raise questions. Challenge organisations to embrace technology. Join the SAIMC and become an active member of your branch.

At the national level we have contact with the DTI, with the Manufacturing Indaba and with ECSA. We have decided nationally to sponsor the FIRST Tech Challenge in South Africa to entice young skills into our industry.

Join our automation project – we look forward to working with you.

Rob MacKenzie (Pr.Eng).

Welcome to Rob MacKenzie and Annemarie van Coller as president and vice president of the SAIMC for 2018.
From the President’s desk

On 22 November, members of the SAIMC gave talks to some students at Mangosuthu University of Technology about the role of the SAIMC in bridging the current gap between education and the requirements of industry.

Prof. P. Naidoo, who initiated the programme, introduced the Durban branch chairman Hennie Prinsloo to the students. Hennie gave them a comprehensive presentation showing the ways in which the SAIMC supports education and industry. He was followed by John Owen-Ellis who spoke about possible alternative career paths and factors influencing their choice. Prof. Naidoo rounded off the session with an overview of the current state of tertiary education.

Students were attentive throughout and were encouraged to ask questions. The Durban committee hopes to make similar presentations to other tertiary educational establishments in the region.

Durban branch

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Secunda branch

November technology evening

On Thursday 2nd November the Secunda branch held its last technology evening for 2017 at the Honeywell Hub in Secunda. Hennie Grobler from Yokogawa presented on the topic ‘PLC versus DCS’. He highlighted some interesting facts regarding the programmable logic controller (PLC). The first PLC was developed by General Motors, in order to simplify the automotive manufacturing process. A distributed control system (DCS) is a combination of a field control system and a supervisory control and data acquisition (SCADA) system. When it comes to choosing between installing a PLC or a DCS it is important to ask the following seven questions:

1. What are you manufacturing and how?
2. What is the value of the product and the cost of downtime?
3. What do you view as the heart of the system?
4. What does the operator need to be successful?
5. What system performance is required?
6. What degree of customisation is required?
7. What are your engineering expectations?

Answering these questions shows that the application or type of process will ultimately be the deciding factor in choosing between a PLC or DCS for process control. We would like to thank Hennie for an excellent presentation.

All instrumentation and control related artisans, technicians and engineers are welcome to attend our monthly technology events in 2018. The planned dates for 2018 will be communicated in January 2018. All Secunda SAIMC presentations will earn CPD points for ECSA registered persons and any enquiries can be directed to the branch chairman Johan Maritz at johanmaritz260@gmail.com or 082 856 3865.

On a personal note, the Secunda SAIMC branch would like to congratulate committee member, Annemarie van Coller on being elected as vice president of the SAIMC council. We are extremely proud of her and know that she will make a big success of this opportunity.
Zambia branch

At the recent SAIMC Zambian branch annual banquet at Kitwe’s Edinburgh Hotel, keynote speaker Oratile Sematle (then-President of the SAIMC) said with more investment in technologies, countries like Zambia should not be shipping out raw copper, but adding a beneficiation process.

Oratile went on to say: “People think that when we automate, jobs will be lost, but there will be a chain reaction in other areas when we automate the production of goods and services.

We should not depend on foreign products, but create our own as African countries.”

Oratile said lack of collaboration between engineers and policymakers was the reason Africa was lagging behind in deploying home-grown technologies.

“We need to address the lack of communication between politicians and industry. There is a need to add value to copper through beneficiation, rather than just exporting the raw material,” he added.

He called on African countries to prepare for a knowledge generation and develop technologies that could be replicated in other destinations.

The banquet was attended by representatives from various industries where the Zambian chapter draws its membership.

SAIMC Zambia chapter President Enoch Shikabeta said the organisation would continue working with government to create a knowledge-based economy.

Tshwane branch

The last function of the year was a meal at Cheers Restaurant kindly arranged by Mark from DesSoft. Approximately 20 people attended, including a dignitary from MERSETA. Thanks to all who attended. During the event, Des Burrows from Rascals was awarded a certificate in recognition of being a patron of the branch.

Call for presentations and AGM invite

The branch invites all patrons (national plus Tshwane) to advise if they wish to present at a Technical Evening during 2018. We have compiled a preliminary schedule and hope to finalise this early in the year at the branch strategy meeting. Kindly note that there is a fee associated with presenting, which is put towards paying for the venue.

We will resume proceedings on 7 February with the AGM and a Technical Evening. We have openings on the branch committee, so please contact us if you are interested to ensure we comply with the nomination process.

SAEEC Conference

Petrus Klopper represented the SAIMC at this event where he spoke about using industrial automation to lock in energy savings, resource efficiency and cleaner production. The presentation will soon be loaded on the SAIMC website and will also be published in a book form with an ISBN number. Overall the presentation was well received and attended by some high-profile visitors.
Benefiting from technology transfer between modern industries

This month, I take a different look at how technology can be transferred between industries, and used to solve heart-wrenching problems. Always touted as the birthplace of new technology applications, Formula 1 racing constructor Williams Racing, based near Oxford, is actually saving 50 Sainsbury supermarket stores in the UK around 15% of their bill for electrical power. This is nothing to do with speeding up the shopping, but because they can make the refrigerated cabinets more efficient. Using the technology of the aerodynamically-efficient rear wing on the Williams F1 car, a similar aerofoil device attached to the front of the shelves in the refrigerator keeps the cool airflow inside the cabinet. An added benefit is that this makes the temperature in these cold aisles up to 4°C higher than before, making the customers happier – and maybe stay longer! The device is being manufactured by a spin-off company, Aerofoil Energy, and will be rolled out across 1400 of Sainsbury’s UK supermarkets.

Sir James Dyson, the British engineer and inventor responsible for novel designs of vacuum cleaner, hand-dryer and hairdryers, has announced that his company is developing an electric car, using his own expertise in electric motors and battery technology. He sees the market for the car in Asia, and will use his air filtering technology to protect the occupants from the fumes from other vehicles on the road. Following hard on the heels of this announcement, the first self-driving shuttle bus was introduced into regular service in Las Vegas. On the first day of operation, the bus was providing free trips round a 1 km loop, at 25 km/h max: during one circuit, it met a lorry doing an illegal reversing manoeuvre. As programmed, the bus detected the lorry and stopped, but the lorry driver (human) continued his move and hit the shuttle, damaging the front bumper. He received a ticket for ‘illegal backing’. No-one was hurt and the shuttle, which has no steering wheel or brake pedals, continued providing free trips round this loop for the rest of the day.

Motor neuron disease (MND)
MND, otherwise known as ALS, or Lou Gehrig’s disease, is a rapid muscle wasting auto-immune disease. Sufferers need mobility aids delivered quickly, as any delivery delay makes them no longer suitable. Typically the time span from diagnosis to death is two years, but the brain is unaffected throughout. The exception to this timescale, somehow, is Professor Stephen Hawking, the theoretical physicist at Cambridge, who is still alive after over 50 years. I saw him there, being wheeled along in his chair, working on a screen full of 0s and 1s, interrogating them by moving a facial muscle (in his cheek) which allows him to move a cursor. He comments: “I have experimented with eye tracking and brain-controlled interfaces to communicate with my computer. However, although they work well for other people, I still find my cheek operated switch easier and less fatiguing to use.” Work at Nottingham University has specialised in this area, and Prof. Hawking has helped their PhD students to test new systems.

It all started in 1997, when Hawking happened to meet Gordon Moore, the co-founder of Intel. Hawking lost his voice in 1985, when he contracted pneumonia and had an emergency tracheotomy. In ’97, he had an AMD processor for communication, so Moore fixed him up with an Intel microprocessor based computer, and has worked with him ever since. A colleague contacted the CEO of WordsPlus, in California, who had developed a program (Equaliser) for a relative with ALS, to enable her to select commands and words. Equaliser was loaded onto an Apple device that drove a ‘SpeechPlus’ synthesiser. Hawking continued with conventional software behind his interface until 2012, when at 70 he was slowing down. An Intel team basically then loaded all his books and papers into the predictive text algorithms, a system known as ACAT (assistive contextually aware toolkit). As an example, when Hawking writes ‘the’, the system offers ‘black’ and then ‘hole’. This once more speeded up Hawking’s communications interface.

There are now many systems available for MND sufferers, to interface to emails and speech synthesis, using eye movement sensors such as those from Eyegaze. More importantly in a practical sense, is that these can also be used to drive and steer their wheelchair motors, to enable some semblance of independence and continued communication for the people living with these problems.

Nick Denbow’s European report

Nick Denbow spent thirty years as a UK-based process instrumentation marketing manager, and then changed sides – becoming a freelance editor and starting Processingtalk.com. Avoiding retirement, he published the INSIDER automation newsletter for 5 years, and then acted as their European correspondent. He is now a freelance Automation and Control reporter and newsletter publisher, with a blog on www.nickdenbow.com.
System Integrators

Abacus Automation
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 21 years in the industry, this BEE-certified, award-winning and internationally acclaimed company has highly qualified, experienced and professional staff. It operates out of offices in KwaZulu-Natal.

Tel: +27 (0)31 702 5767
sales@abacus-automation.co.za
www.abacus-automation.co.za

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

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Hybrid Automation

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.

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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 IoT solutions.

Tel: +27 (0)11 466 1673
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www.moore.co.za

PSY International

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

Tel: +27 (0)11 782 5449
paul@psy-intl.com
www.psy-intl.com

Saryx Engineering Group

Saryx Engineering Services offers complete solutions to optimise plant-wide process control and enable operational excellence and focuses on industries that require continuous control for complex, business critical operations, including Mining, Metals & Mineral Processing, Chemicals, Utilities/Water, but is equally comfortable with smaller non-critical projects.

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www.saryx.com

Iritron

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. The company’s fields of expertise encompass all the levels in the automation hierarchy.

Tel: +27 (0)12 349 2919
alwyn.rautenbach@iritron.co.za
www.iritron.co.za

Process Dynamics

Process Dynamics specialises in industrial automation and process control. The company is one of Africa’s leaders in turnkey automation projects and process dynamics, and specialises in the integration of scada (Wincc, Wonderware, Citect) and PLC (Siemens, Schneider, Allen Bradley) as well as panel manufacturing and installation.

Tel: +27 (0)11 394 5412
systems@process-dynamics.co.za
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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Customer centricity and a sterling team pave the way for CSS

A customer-centric approach has allowed Control Software Solutions (CSS) to attain a high percentage of repeat business from its growing client base. This Level 2 BBBEE company has a solid 15 years of experience devising and designing customised solutions for a number of industries. Headquartered in Durban, with offices in Gauteng, the company employs 20 highly qualified technical specialists who are driven by the common goal of providing innovative customised solutions in the electrical, control and automation sectors.

Success factors
Director Pieter Venter says that the success of the company can be attributed primarily to three factors: a flat management structure that sees all employees placed on an equal footing, whereby they are able to develop to their full potential; a team that is characterised by excellence in knowledge, experience and performance; and a focus on acquiring a thorough familiarity with the customer’s operations. “By partnering with our customers in relationships that thrive on information sharing and open communication, we are able to enhance customer operations for maximised productivity and uptime.”

CSS works with a number of recognised international manufacturers and suppliers to devise the best possible solution for each customer. Certification from these suppliers provides customers with the assurance that the CSS team is completely up to date on current trends and technology. The company recently achieved Master Alliance Level status with Schneider Electric, the only one in Africa and one of only six companies worldwide to claim this status. In addition, CSS holds Wonderware certification and is also a Rockwell and Siemens system integrator partner.

Projects and awards
CSS has been honoured with a number of prestigious awards from its suppliers that include Best Production and Performance Management Application from Wonderware Southern Africa in 2006 and 2007; SABMiller supplier of the Year Award for 2005, 2009, 2013 and 2014; Best HMI Application award for the Transnet Port of Durban; Plantstruxure Partner of the Year and Most Certified Engineers (2015) and Technical Expertise & Excellence Application Award (2016) from Schneider Electric.

Together with a focus on developing its own internal human assets, the company has been involved in the Seed of Hope community project since 2003. What started as a drop-in programme for vulnerable children on the rural outskirts of Durban has evolved into a formalised plan called Simunye Time that includes the teaching of songs, arts and crafts, and life skills. CSS continues to contribute to the project with upgrades to the children’s playground, new toilet facilities, the supply of computer and network equipment, as well as a new sewing skills training room.

A number of high-profile projects have been completed in the food and beverage industry, including Phases 1 (front end extraction) and 2 (steam generation and power generation) of the RCL Pongola sugar mill; Bakers Biscuits dough mixing control for Snackworks; and Nestlé’s infant formula dry mix control. Projects for Assmang Cato Ridge’s export facility and DCS replacement at Arcelor Mittal’s coke oven by-products plant have also recently been completed.

Projects currently underway include the SAB Rosslyn expansion contract; Phase 3 (backend) of the RCL Pongola sugar mill; and the Phoenix wastewater plant expansion contract. “We tackle contracts of various sizes, from small to very large and due to the fact that we have worked in industries that include metals and minerals, automotive, materials handling, utilities and municipalities, we are able to leverage our experience to tailor-make best practice solutions,” concludes Venter.

For more information contact Pieter Venter, Control Software Solutions, +27 (0)31 914 0040, pieterv@cs-solutions.co.za, www.cs-solutions.co.za
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Simple and easy to use, yet smart enough to automate

The V&A iCon® valve positioner family combines simple calibration and easy operation with high-level integration capability.

In a world driven by technology, efficiency and total cost of ownership, the V&A iCon® range of valve positioners meets all customer needs, be they simplicity, ease of use or integration with an existing plant automation system.

Ease of use
Valve & Automation has designed the 270991 positioner family to make life easier for plant operators, not more difficult.

Firstly, it is easy to fit. Proper mounting of a positioner onto a valve or actuator can be a significant challenge for an end-user because of the wide variety of valves and actuators in use today.

Valve & Automation overcomes this through a choice of standard factory-manufactured brackets to suit almost any valve/actuator combination found in industry. So, whether the valve requiring a positioner comes from ABB, ARCA, Fisher, Jamesbury, Masonellian, Neles, Samson, Valtek, or any other manufacturer, there is a suitable attachment kit available. This eliminates the engineering risks often associated with positioner integration into existing plant equipment, without the need for any specialised knowledge or expensive tools.

Secondly, it is easy to calibrate. Valve & Automation has listened to its customers, and understands that in a manufacturing environment where budgets are constrained and skilled resources are limited, keeping things simple is often the best solution. With this in mind, the 270991 has been designed with the option to perform setup and calibration, using the onboard pushbuttons in conjunction with the integral LCD display. Not only can technicians set up the positioner this way, but they can also carry out fault-finding on the device and the valve, thus eliminating the need for costly loop simulators.

“We have concentrated on designing a positioner solution for our clients that makes it easy to calibrate and diagnose from the device itself, rather than via computers or hand-held terminals as was the case in the past,” explains national sales manager, Desmond Delport. “The three pillars on which our design is based are easy to install, easy to calibrate and easy to use. For those customers with severe budget restrictions, or lack of access to suitably skilled technicians, we have even reintroduced older pneumatic and electro-pneumatic versions of the positioner, in order to provide them with a solution that can be calibrated and adjusted using just a screwdriver.”

Skilled support for smarter requirements
While outwardly the 270991 has been designed for simplicity, the requirements of those end users who need an interface to their sophisticated plant control systems has not been ignored. Most positioners from the range (excluding the older versions) can be interfaced to a control system through discrete I/O, analog I/O or through one of the many common process control protocols available, including Foundation Fieldbus H1, FoxCom, HART and Profibus PA.
From a predictive maintenance perspective, performance of the valve + actuator + positioner combination can be configured and tested through the FDT/DTM-based software included in the positioner. These diagnostics reduce the risk of incorrect valve operation, allowing owners to initiate timely repair activities before valves begin to show off-specification performance, thus preventing costly unplanned process stoppages.

“In organisations where money is no obstacle, and the resources with the skills to interpret the diagnostics are available, this is an ideal solution,” explains Delport. “But what we have found in practice, at least in our customer base, is that these conditions very seldom exist.” To get around this, Valve & Automation has invested heavily in training its own staff to support all the intelligent functions of the 270991. The company has also become a member of PACTware in order to be able to support the high-level diagnostic functionality via the intelligent fieldbus interfaces.

Delport says that there are now facilities in place at both the Vereeniging and Durban offices where customers can be trained in the basic positioner functionality, as well as the advanced diagnostics and interfaces if required. “Because each of our customers has a different set of requirements, ranging from the very simple to the more advanced, we had to devise a solution that suited all these different demographics,” he adds.

With the 270991 range of solutions, Valve & Automation is now able to offer a simple pneumatic or electro-pneumatic positioner solution to those customers who need to perform calibration with just a screwdriver because they have no access to technicians with computer skills, while at the same time, it is able to offer a top-of-the-line smart solution to those users who need to integrate the positioner with their higher level automation systems.

“Everyone understands the benefit of the latest smart technology,” concludes Delport, “but not everyone has the money or resources to take advantage of it. At Valve & Automation we understand this, which is why we now offer our customers a range of positioner solutions that they can easily support themselves at the basic level, and we are in a position to help, should they need to integrate the more advanced functionality at a plant automation level.”

For more information contact Desmond Delport, Valve & Automation, +27 (0)11 397 2833, desmond.delport@valve.co.za, www.valve.co.za
Digital sensors return a discrete value of 0 or 1 to a controller. The controller, usually connected to I/O systems over a fieldbus, reads out the bus system data in a set cycle, commonly clocked in the millisecond range. Important to note here is that the bus system needs a degree of determinism and the controller must run in synchronisation with it, even if bus cycles are sometimes longer or shorter. With Beckhoff hardware and software, the synchronisation between controller and bus system are assured, as are the deterministic features of the ultra-fast EtherCAT communication system. This means that PC-based control provides the ideal foundation on which to implement oversampling technology.

**Bus cycle subdivision with oversampling**

Oversampling involves polling signals at a configurable multiple of the bus cycle time (i.e. in micro cycles) and writing the results to a temporary buffer. The set of process data collected is then transferred during the next bus cycle. Oversampling functionality can avoid situations like the following during signal polling: If, for example, a sensor is queried every 10 ms, only the data available at the precise time of the query is actually acquired. The controller is effectively blind from one query to the next, so details of any changes in the sensor’s state occurring between PLC queries are not recorded. For instance, a sensor’s state might switch from 0 to 1 and stay there for 9.9 ms. If it then reverts to 0, the sensor signal – from the perspective of the controller reading it out – will appear not to have changed at all over the 10 ms cycle.

Situations like this can be detected by using an EtherCAT oversampling input terminal such as the EL1262 to connect the sensor. This terminal is able to subdivide the bus cycle into as many as 1000 micro cycles. In the case of a 10 ms bus cycle, an oversampling factor of 1000 translates into a sampling interval of 10 µs. In a 1 ms bus cycle, a sampling interval of just 1 µs can be achieved, which is the shortest that EtherCAT oversampling terminals can currently support. This technology is ideal for reading out SENT sensors.

**The pulse width encoding protocol: SENT**

Single Edge Nibble Transmission (SENT) is a simple, unidirectional, asynchronous protocol that encodes sensor data based on the time between falling edges in a digital signal. The pulse length describes the signal value transmitted. A single bit in the SENT protocol generally corresponds to 3 µs, which meets the minimum requirement in terms of sampling precision. The signal level is 5 V. The EL1262-0050 oversampling terminal meets both requirements in that it supports precise data acquisition down to 1 µs and is capable of processing the signal level directly. It can sample each bit of the SENT signal three times – more than enough to read the data transmitted in a signal pulse.

The data sets acquired are then processed in a ready-made function block, which evaluates the pulse lengths recorded, calculates the checksums and then marks the value either as valid or invalid.

The SENT protocol is mainly used for communication between sensors and electronic control units in vehicle electronics. Due to the simplicity of the protocol, the microcontrollers in ECUs are capable of evaluating it. SENT protocol receivers are not available for use in constructing measurement and test benches, but the open Beckhoff control system offers an alternative: The EL9505 power supply terminal can serve as the required 5 V power source, and the EL1262-0050 variant of the EtherCAT digital input terminal can be used to capture the sensor signal. In this way, SENT sensors can be directly and easily connected to the open and modular control platform from Beckhoff. This means that test benches equipped with Beckhoff technology can be used to conduct quality inspections on, say, throttle valve or steering torque sensors and make any necessary adjustments before the sensors are fitted to a vehicle.

**For more information contact EtherCAT Technology Group, +49 911 540 56 226, press@ethercat.org, www.ethercat.org**
The demand for electric vehicles is rising, which has had a knock-on effect on battery producers, as batteries – alongside the electric motor – are the heart of E-cars. The battery accounts for between 30 and 40 percent of the value added in purely electric vehicles. Around the world, new factories are being built and vehicle manufacturers as well as battery producers are looking for automation. The production of lithium-ion batteries is presenting automation technology with special challenges, from the production of electrodes, to the production of cells and through to the assembly of the battery module.

Johannes Strasser, industry segment manager electronics at Festo explains: “This year, car manufacturers are heralding high investments and the declarations of intent of manufacturers regarding battery production have increased tenfold. Alongside the major car brands, new electrical car manufacturers are being set up and new companies are joining the industry of battery cell production every day. The focal point of production is currently Asia and primarily China, where the Chinese government is actively supporting the future battery industry.”

Increased revenue
In the last two years, Festo’s revenues in the growth market of electro-mobility doubled year on year. The automation provider advises and supplies major global customers such as the Korean battery manufacturer LG Chem. The key components in Festo’s success here are its broad product range including copper-free products, its services and engineering tools as well as a worldwide team with specialist know-how and solution competence that provides customers with expert advice in project planning and conceptualisation.

The company’s production manager Kim Sung Chul says, “LG Chem, Korea’s leading manufacturer of advanced batteries, is constructing an electric vehicle (EV) battery plant in Poland. This is the first large-scale lithium-ion battery plant for automotive application in Europe. Festo is the handling equipment supplier for the plant and LG greatly appreciates the competent consultation, the product range and quality, the engineering concepts and the global network of automation experts provided by Festo.”

Strasser adds: “With expert teams in the main markets of Korea, China, USA and in Europe, we are a truly global partner that offers direct contact and customer support on site. For example, we have worked with LG Chem for over two years. We are delighted to have been chosen over strong international competitors to contribute our solution competence and know-how in the automation of battery modules. For LG Chem’s new factory in Poland, we supplied all the electrical axes and valves. All products were designed to be copper-free.”

Copper-free requirement
Festo offers everything from a single source: standard handling, special solutions and copper-free products that do not damage or contaminate the sensitive lithium-ion cells during handling. Thanks to the use of state-of-the-art materials, roughly 95 per cent of Festo’s standard product portfolio is already free of copper. Since 2017, Festo has also offered special copper-free products that are oriented towards current market criteria: the guide bearings, bearings and all parts that generate friction are free of copper. Festo’s standard products also meet ISO 6 clean-room conditions and more. The products are tested in the company’s own Competence Centre for Cleanroom Technology in Singapore, in cooperation with a local university.

Thanks to the engineering tools from Festo, solutions and systems can be virtually measured and designed, thus saving time and costs in project planning and design. This phase represents 25-30% of the overall service life costs in machine and plant construction, while energy-efficient products and services help to reduce power consumption during production.

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Paint curing applications in the automotive industry

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.

Telco sensors in the automotive industry
Telco’s photoelectric sensor systems are the market leaders in safeguarding and monitoring automatic doors on transportation vehicles, including buses, trams, light rail and trains and platform screen doors. These versatile, durable and high performing sensors are designed to operate reliably in the challenging, adverse conditions found in moving vehicle doors, whilst providing reliable and dependable detection and monitoring of passengers. Telco offers both standard and customised systems, ensuring optimal sensing solutions for the customer and the individual installation. Telco sensors are vandal-proof and compact and are unaffected by high degrees of extraneous light, contamination and misalignment.

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.

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SMC drives the automotive industry

Known for its support to the automotive industry, SMC offers a comprehensive line of pneumatic products which both meet and exceed the automotive industry’s demanding manufacturing requirements. The result is robust pneumatic systems for continuous operation, efficient production ramp up and the ability to operate in extreme temperatures and welding environments.

While many companies offer components to the automotive industry, SMC has spent years understanding the industry’s needs and adapting and evolving with them, looking to maximise performance and minimise energy costs and downtime.

In 2017, the company started manufacturing and assembling pneumatic/electro-pneumatic panels in-house at its facilities in Midrand. From a simple assembly to a complex system, SMC’s sales engineers together with its designers, panel builders and technical teams work with customers to ensure that panels are designed to specification, within budget and on time.

Most recently, SMC’s team worked with a large automotive manufacturer to alleviate production time and speed up processes by using one of its custom-built panels to match the application. The previous application required that the staff on site had to manually manoeuvre two side panels of a vehicle and have these welded onto the chassis. This was proving labour intensive and safety was of concern.

The team at SMC found the perfect solution to the problem – an SMC panel which houses control valves and operates CP96 cylinders (ISO) and AS flow controls; this allows for an automated process that reduced both welding and labour time.

Featured products for body assembly

- CQ2 compact cylinders: the CQ2 series has a long service life and optional coil scraper for weld spatter removal making it an ideal selection for resistance welding applications.
- Clamp cylinders: complementing the CQ2 is a full range of clamp cylinders, including the CKZ2N power clamp which conforms to the NAAMS standard.
- SY series: series SY 5-port valves in combination with the EX600 modular fieldbus system yield versatile configurations, satisfying diverse user requirements.
- EX600: series SY 5-port valves in combination with the EX600 modular fieldbus system yield versatile configurations, satisfying diverse user requirements.
- AC modular units (FRLs): the AC series modular FRL ensures the precise flow of clean air to maximise operation of system components. A host of available options such as the manual residual pressure release valve on the -X352 variant ASP speed controller includes an internal check valve that will pneumatically lock an actuator in place for drop prevention.

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Risk management in automotive manufacturing

In automotive manufacturing operations, risks that go unaddressed can lead to missed production targets, safety incidents and vehicle recalls.

Safety hazards, ageing assets and security threats can negatively impact on business, including employees, revenue, plants, intellectual property, vehicle quality and customers. They also risk tarnishing the company’s brand and reputation – potentially to the point where they erode customer trust or loyalty.

To prevent risks from reaching this point, management efforts should focus where the problems can be controlled – the industrial automation infrastructure. Organisations can help improve risk management by setting their sights on four key areas: safety, quality, obsolescence and security.

Safety: focus on the three Cs

While industrial safety is vital in any automotive operation, it is often viewed as a costly burden, at odds with productivity. But that need not be the case. Best-in-class manufacturers, defined as the top 20% of aggregate performance scorers, have been found to achieve higher OEE and less unscheduled downtime, while experiencing less than half the injury rate of average performers, according to Aberdeen Group research. Top performers also experience far fewer workplace accidents than average performers – to the tune of one in 2000 employees versus one in 111 employees.

So, what are best-in-class manufacturers doing to excel in operational excellence and safety? They share a common set of best practices that can be grouped into three core pillars – or the three Cs – of an industrial safety programme:

1. Culture (behavioural).
2. Compliance (procedural).
3. Capital (technical).

Of course, it is not enough to merely focus on these pillars, the top performers strive for excellence in each one of them.

From a capital standpoint, for example, too many automakers today are forced to shut down machines for safety reasons if a problem occurs on the line. But in certain instances, contemporary safety technologies can be used to keep a machine running at a designated safe speed, even when the safety door is open.

To see where an automotive manufacturing operation stands in each of the three safety pillars, consider using the Safety Maturity Index tool from Rockwell Automation. It measures current performance and provides recommendations for improvement, if needed. The tool is free to use at https://tinyurl.com/y9vvov45.

Quality: get better visibility with MES

Quality can never be sacrificed, even as production targets increase and workforces turn over. Amid these changes, one of the best ways to maintain quality is with real-time information visibility.

Modern MES software can harness the data that has long been buried in operations to help improve quality management and reduce process variability. For example, it can capture data on process results, defects and attributes to help you meet key requirements, such as visual defect tracking, statistical process control and root-cause analysis.

Genealogy and track-and-trace applications in an MES also can give new insights into processes, production events and quality information. The applications offer forward and backward traceability to identify upstream or downstream quality issues. And they can provide product location and as-built data to help limit the scope of recalls.

Beyond data collection, an MES with an error-proofing application allows enforceable workflows, which can help verify workers consistently build vehicle assemblies and sub-assemblies to specification.

Should errors occur on the production line, MES hold-and-quarantine capabilities can be used to manage affected vehicles, which supports the ISO 9001 and TS16949 automotive quality initiatives. Ultimately, it could help prevent defective and potentially dangerous vehicles from leaving production facilities and reaching customers.

Manufacturing-process quality control was a priority for Guangzhou Automobile Group, one of China’s top 10 automakers, when it implemented a modern MES. The company uses its MES to perform defect control, and to carry out inspections and verification of quality issues. The MES also collects key component numbers and binds them with vehicle numbers, forming a genealogy record for every vehicle to help confirm they are produced to standard.

Obsolescence: assess your assets, identify risks

Equipment and software obsolescence can result in downtime and lost productivity. The best way to tackle obsolescence is with proactive life-cycle management. This includes working to identify obsolescence risks that exist today, as well as planning to facilitate easier maintainability of legacy equipment and access to spare parts.

The best place to begin is with an
assessment of all assets. Many companies attempt to do this on their own, only to discover the cost. They sacrifice an experienced engineer for several months simply to collect a baseline of hardware and software information for a single plant.

An installed base evaluation (IBE) service is often much more efficient. It can collect and aggregate hardware and software data across multiple plants in just a few weeks. What’s more, IBE services also provide reports that offer guidance on where critical risks exist. A software inventory, for example, could help uncover potential compatibility risks between versions as systems are connected or services updated.

The findings from these activities can then be shared across multiple functions. Maintenance personnel, for example, could receive a report comparing installed equipment versus storeroom inventory to improve spare-parts management.

**Security: go in-depth**

Being more connected requires the ability to get data to and from machines and people – at every level, in any location and in the right context – in a secure manner. This can be achieved with three key steps:

First, conduct a security assessment to understand your risks and vulnerabilities, and to identify the mitigation techniques needed to help bring your operations to an acceptable risk state.

Second, adopt a defence-in-depth (DiD) security approach. DiD security establishes multiple layers of protection by addressing security at six different levels: policy, physical, network, computer, application and device.

Finally, work with trusted vendors that share your security goals. Before selecting vendors, request disclosure of their security policies and practices. Vendors should be taking steps to address security within their own operations, such as providing security training to employees, and in the products they supply to you.

Daimler Trucks North America, for example, used aspects of the Converged Plantwide Ethernet (CPwE) validated design guides from Cisco and Rockwell Automation for its network architecture design and deployment. This helped the company create a converged, plant-to-business network that provides secure and reliable connectivity across the shop floor and in office areas.

**The power of prevention**

Manufacturers may not be able to stop every problem in their automotive operations. But, they can reduce the likelihood of them occurring by focusing their risk-management efforts on where the risks originate. Proactively leveraging existing investments and infrastructure will help better protect the organisation’s people, brand and business performance.

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**SICK track and trace systems début in SA tyre plants**

SICK Automation recently supplied two turnkey track and trace systems for multinational tyre manufacturers Bridgestone and Sumitomo Rubber at their South African plants, marking the first installations worldwide of the sensor specialist’s latest image-based code readers, the Tire Lector Array (TLA), in the tyre manufacturing industry.

By tracking and tracing barcoded tyres across the manufacturing and internal handling cycle, the TLA plays a critical role in managing and controlling the ‘just in time’ production processes of the plants, as well as automated batch and distribution management.

“A successful technological solution for this application ensures that, no matter the height, diameter or orientation and position of the tyre on the conveyor belt, every unit is reliably identified,” explains Prishan Chain, key account manager, SICK Automation Southern Africa. “The high-resolution Lector6x sensors, with intelligent technology features including dynamic focus and adaptive illumination, provided the capabilities required for Japanese process quality specifications.”

Ten systems were supplied to the Bridgestone plant in Pretoria in 2016, while the Sumitomo Rubber plant in Ladysmith has a total of four systems. Both plants manufacture the full range of standard and low-profile tyres for on-road vehicles, from 13 to 20 inch.

“In each case, SICK Automation worked closely with the manufacturers in designing and supplying the systems,” Chain continues. Each TLA consists of three Lector6x sensors, positioned both above and below the conveyor. The modular structure housing the sensors is easily customised according to any customer width and height requirement.

“As a turnkey solution, SICK Automation product engineers in Germany trialled and tested the optimum TLA solution according to the manufacturers’ exact process and automation requirements. The engineering, integration, commissioning and service capabilities of SICK Automation Southern Africa provided the local level of expertise required for executing and supporting this capital project successfully.”

With full engineering, distribution and support of the company’s range of over 40 000 sensors, SICK Automation is enabling local plants to achieve the highest global standards of factory, plant and process automation.

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Nidec introduces motors and drives for the steel industry

Nidec, a fully integrated supplier of motors, drives and automated systems, exhibited a new, broad range of solutions for the metal manufacturing and finishing industry at the 2017 Association of Iron and Steel Technology (AIST) show. With equipment in over 1000 mills around the globe the company’s expanded offerings now enable iron and steel manufacturers to tap one electrical supplier for low and medium voltage motors and drives, a complete encoder product line, Level 2 automation/machine control and power quality solutions.

As one example of Nidec's comprehensive solutions, the newly acquired line of Control Techniques variable frequency drives and the recently upgraded U.S. Motors brand ACCU-Torq motor integrated with Nidec Avtron encoders was on display.

With decades of experience in steel applications, Nidec is a single source supplier which can provide proven and cost effective solutions built for any situation, from mining the ore to secondary processing, and from pump and fan drives to level 2 automation.

Nidec's industry influence has expanded dramatically in recent years as the company brought together innovators such as Ansaldo Sistemi Industriali S.p.A and Avtron Industrial Automation. Its recent acquisition of Control Techniques and Leroy-Somer broadened its product portfolio to include IEC motors, low-voltage drives and increased automation capabilities. The superior variable frequency drives (VFD) technologies engrained in Control Techniques provides customers the option of a variable speed solution.

Today Nidec comprises more than 300 companies and 140 000 employees ready to help the metal industry solve the most complex challenges.

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The mining industry is in a crisis. Failure to get the policy, legislative, administrative and operating environment right is being compounded by a decline in resource demand and resulting excess capacity, weakening prices and increasing volatility. Many also need to mine deeper to reach new deposits, which is resulting in a significant increase in the cost of extraction and these costs are forcing mining companies to make difficult decisions to sustain short-term operations, while still adhering to long-term objectives. What's more, advanced technologies are severely impacting the broader industry, albeit in a seemingly unrelated way. Emerging products and services require new materials and this is changing the mix in the demand for minerals and metals and is expected to continue. This of course has long-term implications for the demand for primary resources. And for the foreseeable future, this state is 'the new normal'.

To cope with this 'new normal', the mining industry will have to embrace this disruption as both a constraint and as an enabler. When considering digital disruption, most cite the example of machinery optimisation and how the mining industry can leverage digital technology to deal with the productivity and safety challenges they face. In fact, most of these focus on the technology dimension of this digital transformation and under-emphasise the people management and organisational dimensions. Few talk about the new future of work, the changing role of jobs and the new jobs that will emerge. Even less is said about how this digital transformation might be managed – a difficult process characterised by many knowns and even more unknowns. What will the mine of the future look like?

In essence, change in every respect is required for survival and at the heart of this change, is people. If mining companies are to succeed, they will require a deeper understanding of the shifting community to lessen the social divide. Furthermore, increased demand for transparency and accountability in business transactions globally is forcing the sector to relook at how people and the industry are managed.

There is an unwritten set of expectations of the employment relationship distinct from a formalised contract and this psychological contract will define the employer-employee relationship. This relationship needs to shift to view workers as people with families rather than just the ‘hands’. Only then are we likely to see bottom-line improvements as a result of more engagement, collaboration and organised activities that translate into more inclusive teams, with a shared vision and better relationships based on transparency and mutual respect. Shifting people from an income state-ment expense to a balance sheet asset is critical.

In order to do this, innovative thinking needs to influence the way mining companies engage with workers, their surrounding communities and those from their labour sending areas. New technologies and ways of connecting have a potential to influence a different outcome for the broader community, one that makes the mining house and community share the responsibility for a changing landscape with divergent future scenarios.

With new tools comes a new emergent management philosophy and so we have to consider what it will take to transform the current management philosophy appropriately in the mining industry in ways that will enable them to leverage the potential benefits of digital technology and transformation.

As in any other age, management in the digital age should be concerned with the deployment and coordination of people and resources at various levels of the organisation to steer a new course in realising strategies. The difference here is that the organisation and its key resources will be digitally enabled with a view to becoming far more efficient. Structures and jobs will be fluid and permeable, merging into value eco-systems rather than value chains.

People will work in virtual teams and disband as needs change. The management challenge will lie in data analysis and deploying and co-ordinating people and digital resources in ways that will enable people to do what they do best and digital technology to do what it does best.

Innovation should drive more than cost reduction – it can help mitigate and manage risk, strengthen business models and foster more effective relations. Mining companies need to prepare to shift traditional entrenched models, plan for future scenarios where collaboration is at the centre of a lean operation and use digitalisation to enable and drive the industry forward.

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Becker Mining’s Proloc and ProBeck electronic protection and control relays have been designed for motor protection and cable theft detection in diverse industries, including mining and quarrying, electrification, municipalities, water and wastewater, chemical, petrochemical and general engineering. “Becker’s low voltage relays, with advanced technologies for dependable protection of electric motors used on pumps, fans, conveyors and compressors, can also be used as highly effective stand-alone cable protection systems, to guard against cable theft,” says Frikkie Quirk, senior general manager, electrical.

Becker relays are programmed to detect cable theft by identifying a change in impedance of cable up to 1100 V connected to a motor or pump. In the event of cable tampering, the unit sends an SMS, or activates an emergency alarm or siren. This system is capable of Scada visualisation and is able to communicate relevant information to a control room via an existing PLC. The Becker cable theft detection system, with real time and date, is able to log up to 1400 events, providing critical information, including when the alarm was activated and how long it took for someone to respond. The system needs to be reset at the location of the alarm in order to confirm response by security. When the reset facility is activated, the unit logs the date and time of the response. This protection system, which requires only 220 V or 110 V to power the unit, can also be used as a stand-alone unit to monitor cable without power. A battery backup facility for SMS communication provides power backup for up to eight hours.

Proloc and ProBeck electronic relays for motors (380 V, 400 V, 525 V, 950 V and 1100 V – 3,3 kV and 6,6 kV) have features for thermal overload protection, earth insulation lockout, frozen or vacuum contact failure and earth leakage protection. Other user-selectable features include short circuit, frequency and power factor measurement, as well as minimum load, overvoltage and undervoltage protection.

Becker protection relays are also used to control pumps and motors based on water levels, valve position, temperature sensors, time of day and moisture content of the soil. These devices, which are able to detect dry run in boreholes, tanks and dams, can be programmed to automatically restart pumps after a specified time or set level. An important advantage of this system is a door mounted infrared link that enables a laptop with Proloc software to manage all settings and downloads, without having to open the panel door and expose personnel to dangerous live equipment. This safety feature is a critical requirement in the OHSA Act. No special licences are necessary for the software.

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In the second quarter of 2017, the South African mining industry expanded by 3.9% on the back of increased production of coal, gold and other metal ores such as iron and manganese. A further driver for growth could be found in the digitisation of the industry, as for years the mining, minerals and metals industries have been confronted by operational complexity. The digital revolution could help address this complexity and provide a competitive advantage, yet many companies have not leveraged the new technologies available to make their operations more efficient.

According to Wilhelm Swart, vice president for mining Africa business at Schneider Electric, “The mining, cement, steel and glass industries face constant challenges that place a premium on operational excellence. There has been a significant transformation in digital technologies, which are available to help deal with many of these challenges. By leveraging this transformation, EcoStruxure for Mining, Minerals and Metals helps our customers improve how they manage their operations and plants to improve the bottom line.”

As a global specialist in energy management and automation, the company has announced ‘EcoStruxure for Mining, Minerals and Metals’, a new system architecture and platform that leverages innovative digital technologies and the IIoT to allow companies to connect, collect, analyse and act on data in real time to improve safety, efficiency, reliability and sustainability. EcoStruxure is Schneider Electric’s open, interoperable, IoT-enabled system architecture that leverages technologies in mobility, sensing, cloud, analytics, and cybersecurity to deliver innovation at every level.

Core technology layers
EcoStruxure integrates innovation at three levels:

1. Connected products: field devices with embedded intelligence, such as sensors, circuit breakers, meters, variable speed drives and process instrumentation, provide the link to real-time data that is essential to higher-level control and decision-making.

2. Edge control: real-time and runtime control systems are connected to field devices and collect data from them, analyse current conditions against goals and past performance and make autonomous control decisions (or aid in operator decision-making) to improve process performance. At the heart of the edge control layer is the Modicon MS580 Ethernet PAC (ePAC), the automation controller that uses open Ethernet standards to enable process efficiency, flexibility and cybersecurity.

3. Applications, analytics and services: at the highest level of the EcoStruxure architecture, sophisticated problem solving and analysis is performed on an enterprise-wide basis to optimise business operations and maximise results.

“With EcoStruxure, Schneider Electric is redefining automation and power connectivity, as well as adding an unprecedented layer of software applications and services to help our customers get the most of their assets,” explains Swart. “By bridging IT and OT, EcoStruxure enables them to maximise the value of data and translate it into actionable intelligence for better business decisions.”

Key benefits
EcoStruxure for Mining, Minerals and Metals provides benefit in three key areas:

1. Digital supply chain: through solutions that integrate resource to market activities, inventory management, and operations and planning.

2. Next generation workforce: by providing technologies that attract and empower the next generation of workers and facilitate knowledge transfer, collaboration, situational awareness, mobility and remote operations efficiency.

3. Operational excellence: with solutions that optimise and stabilise process performance and reduce energy usage, thereby achieving the highest level of performance and reliability from critical assets.

South African expertise, global benchmarks
“Schneider Electric recognises the importance of the mining, minerals and metals industries to the growth, employment and prosperity of South Africa and is committed to helping these industries face their challenges head on, through an integrated, scalable operations management platform, backed up years of experience and mining expertise. The company offers complete mining production and operations optimisation solutions to help optimise the business value of every asset, to help the mining industry grow in a sustainable way, through local expertise and global benchmarking. “EcoStruxure is not just another platform limited to asset performance analytics. It is a complete set of digital technologies and applications that can improve the performance of the entire organisation, from people to operations to supply chain,” concludes Swart.

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Siemens has announced a scalable, end-to-end IoT solution, designed to help oil and gas companies optimise production and reduce costs through connected systems, automation, and analytics at the edge. This innovative solution offers companies across the oil and gas industry a cost-efficient solution to link distributed assets into an integrated network with minimal effort, while simultaneously providing a high level of automation.

Declining revenues demand new approaches
In a sector beleaguered by falling prices, Siemens IoT Well Surveillance will allow energy companies to acquire the cost benefits of digitisation. Oil and gas prices have dropped by 50 percent since 2014 and companies are looking to technology for the business transformation that will increase efficiency and optimise operations. Oilfield facilities and assets are typically a significant distance apart and often only partially integrated into automation systems. This makes data capture for central storage and analysis difficult and limits operational visibility. Siemens IoT Well Surveillance lets companies connect and integrate data from previously unconnected assets in a cost-efficient manner, enabling comprehensive condition monitoring, predictive maintenance and reduced facility downtime.

Smart data, condition monitoring and analytics at the edge
Siemens IoT Well Surveillance addresses field operation and oilfield artificial lift control. The solution uses existing sensors and Siemens Simocode motor management system as key inputs for edge data analytics. The edge computing device, an Intel-powered Siemens Nanobox, performs advanced analytics and soft sensing on this data, calculating pump conditions from it, triggering alerts and optimising production. Performing these calculations at the pump enables independent operation on the well. For further processing and field analytics the information is sent to a central system such as scada or an IoT platform. Dynagraph and alert functions with video integration are available for well site personnel via a fully interactive web portal.

Seamless connection between production facility and applications
Overall benefits of Siemens IoT Well Surveillance include increased asset awareness, operational efficiency, and increased revenue from production optimisation. “Siemens IoT Well Surveillance optimises oil production and works with the utmost energy efficiency,” says Uwe Tröger, Siemens global head of oil and gas onshore and senior executive VP of the Process Industries and Drives (PD) and the Digital Factory (DF) divisions in the Middle East. “This enables costs to be driven down in an industry undertaking enormous efforts to ensure continued profitability in the face of low oil prices. By using digitalisation and innovative technologies already successful in other industries, it is also possible to improve both economy and reliability.”

Intel’s technology collaboration
Intel collaborated with Siemens in the development of Siemens IoT Well Surveillance. Both Intel technologies and hardware are featured in the solution, including an Intel Atom processor-powered Siemens Nanobox gateway and an Intel-based wireless access point. The Intel Core i5 processor-powered ruggedised tablet is used for onsite visualisation of up to six months of data and for data capture at the well. Intel also collaborated on the edge software. “Siemens’ innovative IoT solution for artificial lift monitoring, analytics and control, based on scalable Intel IoT technology, demonstrates the value of edge analytics and soft sensing for well optimisation and control, while appreciably lowering the total cost of ownership,” says Christine Boles, general manager of the Industrial & Energy Solutions division in Intel’s Internet of Things group. “Together, Intel and Siemens are helping transform the world of oil field automation and enabling companies to succeed in a challenging market.”

OMV pilot deployment
OMV, a Vienna-based integrated oil and gas company, has been piloting the Siemens IoT Well Surveillance solution at an OMV oilfield since April 2017. An operator of several thousand beam pump stripper wells, OMV is highly encouraged by the early pilot results which have enabled production optimisation, early production loss identification and deferment, maintenance optimisation and field personnel relief. “The Siemens solution enables complete asset awareness at reasonable cost for wells with low production, such as stripper wells,” says OMV Saša Blažeković, team leader, production support.

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Increased whisky production with Yokogawa’s Coriolis mass flowmeter

The James Sedgwick Distillery was established in 1886 and is situated in the picturesque region of Wellington in the Western Cape. The distillery produces both malt and grain whiskies on the same site, which is rare due to a distillery normally only producing one type of whisky. The distillery handles the entire whisky making process from milling the raw ingredients through to maturation and final blending.

Excise duty was becoming costly
Due to the international success of the distillery’s Three Ship’s whisky brand, in 2009, Distell decided to expand its whisky production. As a spirit manufacturer, Distell is liable for the payment of excise duties by the South Africa Revenue Services (SARS). Spirits may generally be defined as ‘ethyl alcohol obtained from the distillation of various base products to an alcoholic strength of usually more than 60% per volume’ and is subject to the payment of excise duty if consumed as liquor within the Southern African Customs Union. Whisky production is also legally regulated, with distillation strengths required to conform to strict limits. Following this, Distell required an online alcohol percentage meter to curb the costly and sometimes time consuming collection of samples, which they had used in the past in order to meet the legal requirements for a whisky as well as SARS’ regulatory obligations.

Distell sought the services of a chemical engineering specialist in the design and supply of equipment and services to the beverage industry in South Africa, with the necessary expertise in ethanol plant specialisation. Logichem Process was awarded the project and was commissioned to provide a turnkey solution. Yokogawa South Africa was contracted by Logichem for the installation and commissioning of a Coriolis Rotamass flowmeter for the distilling process.

Coriolis technology offers the solution
The majority of whiskies at the distillery contain grain whisky made from corn that is mashed, fermented, distilled and matured for at least three years at 66%/vol strength. The full strength product that exits the distillation column passes through Yokogawa’s Rotamass Coriolis flowmeter at 94.3%/vol, and is closely controlled and logged. After the cask maturation process, the product is also blended with the use of the Coriolis Rotamass and is then ready for offsite bottling.

Both measuring points of distilling and blending are therefore crucial during the process and accuracies of 0.6% are required. During the distillation phase, the process has to be controlled though the Coriolis Rotamass flowmeter at 94.3 – 94.6%/vol and exactly 43.0% at bottling phase.

SARS’ stringent monitoring and auditing of the alcohol levels requires that the readings have to be accurate and consistent in order to pass their assessments. Yokogawa’s Rotamass Coriolis mass flowmeter was well-matched for the job with its density calibration for ethanol or water percentage and a special calibration for maximum accuracy and stability. The mass flow meter’s dual bent tube technology and advanced software enabled the customer to measure the very small and sensitive range required. Yokogawa commissioned the mass flowmeter onsite to ensure the correct installation and commissioning from the outset.

In the last decade, the use of Coriolis meters has been changing from general purpose to supporting customers’ needs in specific applications. While the technological complexity increased, the demand for simple operation and handling remained an important requirement. Yokogawa answers these needs by offering six dedicated product lines with two specialised transmitters allowing the highest flexibility. Yokogawa’s Rotamass philosophy gives Total Insight through the entire product lifecycle.

For more information contact
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www.yokogawa.com/za
Yokogawa’s New Coriolis Flowmeters Offering Total Insight:

Six new dedicated transducers and two specialised transmitters

Coriolis flowmeters deliver highly accurate performance in measuring mass and volume flow, density and concentration and temperature.

Essential for general purpose application

Ultimate for demanding and critical applications

Tel: +27 11 831 6300
E-mail: info@za.yokogawa.com
Web: www.yokogawa.com/za
Badger electromagnetic flowmeters

M1000
The electromagnetic flowmeter ModMAG M1000 has been designed for applications in machinery plants, vehicles and batching processes in the range from DN 6 to DN 200 with a variety of process connections such as DIN flanges, dairy pipe connections, TriClamp, etc.

The basic line of M1000s is provided with a 24 VDC power supply without display, with passive outputs, and can be programmed via a serial RS-232 port or via a separate handheld device. The instruments can also, upon request, be factory preconfigured and then just need to be electrically connected on site.

M2000
The amplifier type ModMAG M2000 is best suited for bidirectional flow measurement of fluids with a conductivity greater than 5 µS/cm (> 20 µS/cm for demineralised water).

Instruments in the M2000 series show high accuracy, are easy to use and can be chosen for a large and flexible applications spectrum.

M3000/M4000
These new electromagnetic flowmeters with modular design allow flow measurements in Ex zones 1 and 2, in either the mounted or remote version. The amplifier housing, made of powder-coated aluminium, is available in protection class IP67 and with a separate connection space.

Programming can be done either with closed housing, thanks to a magnetic pen, or with open housing via three buttons. The four-line display shows all necessary data like actual flow, totaliser and status messages. The programmable excitation frequency even enables the amplifier to be adjusted for difficult metering applications. The newly developed process for amplifier compensation enables a high accuracy, especially in the lower flow range.

M5000
The B-MAG M5000 is a battery-powered electromagnetic flowmeter with very high accuracy even at low flows. The excellent repeatability as well as the above average battery life makes this innovative water meter indispensable to the water industry. Typical applications are leak detection in water networks, water consumption measurements and irrigation plants.

The meter is best suited for applications without a power supply, where exact consumption or flow rates are required. The meter can be powered with mains voltage, and in case of a mains failure, the internal battery takes over. All instruments are designed to comply with OIML R49-1 and MID MI-001.

For more information contact Sean Frost, Dupleix Liquid Meters, +27 (0)11 457 0500, sales@dlm.co.za, www.dlm.co.za

Vibrating limit level detection

Kobold has introduced its Kobold NSV level monitors to measure low-density (powdery), fine-grained bulk solids, such as plastic granules, cement, and food like flour, sugar and animal feed. The devices work by the vibrating fork principle. The fork, specifically designed for use in bulk solids, continuously vibrates, and when it is covered by a medium, the vibration behaviour changes. When the device detects this change, it is displayed on a red LED. An additional relay output is provided for signal transmission.

The NSV limit level detectors are ruggedly, but compactly constructed of stainless steel and are insensitive to humidity in materials. Mounting is possible from the top and from the side of a bin, so devices are not only suitable for protection against over-filling, but also signal minimum level accurately. Mountable evaluation electronics are well protected at the top of the device ending in a protection class IP65 plastic terminal box.

Specific versions with elongated neck pipe of up to 3 m make it easy to install vibrating forks in varying heights. The devices have no mechanical moving parts and are thus virtually maintenance-free. The NSV can be used in explosion-proof areas according to ATEX II 1/2 D Ex tD A20/A21.

For more information contact Instrotech, +27 (0)10 595 1831, sales@instrotech.co.za, www.instrotech.co.za
Kobold has on offer its model MAN-SD intelligent digital manometers that offer reliable pressure monitoring of plant and machinery with application in the fields of mechanical engineering, environmental technology and hydraulics. These battery-powered devices, which are fitted with piezo-resistive sensors, resist overloads up to three times nominal loading.

There is a choice between 24 measuring ranges, which extend from -1.0 up to 0-1600 bar. The manometer can be installed in such a way that the easy-to-use four-digit LCD display can be very easily read, as both the process connection and the front cover are rotatable.

Operation is simple and convenient using three function buttons on the film-covered keypad. The zero point can be set automatically using the zero function, and a freely-selectable password offers protection against incorrect or unintentional operation.

Models with analog or relay output are available. In the model with a push button and relay, switching point and hysteresis can easily be set using the keypad. The devices can also be provided with a peak value memory.

This robust pressure measuring device fulfils Protection Class IP65 and is therefore suitable for use in tough applications. All parts which have contact with media are of stainless steel or ceramic.

For more information contact Instrotech, +27 (0)10 595 1831, sales@instrotech.co.za, www.instrotech.co.za
Kobold has on offer the KSK/KSM plastic flowmeter and monitor that works on the suspended float measuring principle, where the float glides up and down in a conical measuring tube. The units, constructed of polyamide or polysulphone material, easily handle a variety of corrosive media, as well as all neutral media. Their light weight makes them ideally suited for systems which cannot be statically loaded, for example, non-stationary technical systems. They find application in cooling circuits, water treatment and plant engineering. The standard measuring ranges of model KSK are 1,5 – 11 ... 100 – 1000 l/h water and 0,15 – 0,45 ... 20 – 105 Nm³/h air. Model KSM's ranges are 15 – 150 ... 8000 – 60 000 l/h water, 0.8 – 5 ... 300 – 2500 Nm³/h air.

The maximum temperature range depends on the design and options, and varies from 60 to 100°C. Maximum pressure for KSK is PN10, (PN16 for KSM). The percentage scale can be replaced by scales with other units on request. The scale length and direct readability of the float position guarantee an accurate identification of the reading and a visual inspection of the measured medium. By upgrading the instrument with a potential free reed contact, users can also have an economical flow monitor with bi-stable function in addition to the flowmeter function. The screw cap allows an easy installation in any system. Corresponding screw fittings are available on request.

For more information contact Instrotech, +27 (0)10 595 1831, sales@instrotech.co.za, www.instrotech.co.za

The new KRN1000 series paperless process recorders from Autonics feature 5,6” TFT colour LCD touchscreen displays with excellent visibility and intuitive control interfaces. The recorders are capable of processing 27 different inputs including RTD, thermocouple, and analog input types. The outstanding performance of the recorders is matched with affordable prices to ensure top value to users.

The instruments also feature high-speed sampling rates of up to 25 ms and an adjustable recording cycle time between 1 to 3600 s. USB, RS-422/485, and Ethernet communication support is standard on all models for flexible application in diverse industrial settings. The units also provide high capacity internal memory storage of 200 MB, and also support external SD/USB memory storage of up to 32 GB, ensuring that no information gets lost. Nine different measurement graph types are available including bar graphs, trend graphs, and digital displays, so that users can read important data best matching their application. The KRN1000 series also feature a compact, space-saving design with 69,2 mm rear-length, allowing easy installation in tight or limited spaces.

Various user-friendly functions and features are also standard, including easy access pop-up menu, virtual keyboard, 23-colour support, check data history and file history, group settings, event list, and much more. Monitoring and configuration is possible via PC using the free comprehensive device management software DAQMaster. The KRN1000 series is available in 4, 8, 12, and 16 input channel models with various input/output options including digital input, alarm relay output, and 24 V DC power output for transmitters.

For more information contact Philip Kim, Autonics Corporation, +82 51 519 3232, sales@autonics.com, www.autonics.com
Instruments having their own pulse beat – that describes the concept of Heartbeat Technology for maximum safety and the highest possible availability. The technology equips instruments with a comprehensive diagnostics and verification concept and also facilitates predictive maintenance. Costs for the provision of evidence for functional efficiency or SIL tests are thus reduced.

Endress+Hauser has expanded its offering in the free space radar market with the addition of the new FMR 60, 62 and 67. These units use frequency modulated continuous wave (FMCW) technology of 80 GHz compared to the other units 6 GHz or 26 GHz which are also pulsed frequencies.

The use of the high frequency of 80 GHz brings several advantages to the table. This allows for larger measuring ranges up to 125 m compared to 70 m of pulse radar technology. Because of the shorter wavelength of the higher frequency this also leads to a more accurate measuring result of up to 0.5 mm. FMCW evaluation with slightly higher dynamic range combined with the narrow beam of the 80 GHz also helps in demanding applications. The addition of these units to Endress+Hauser’s existing Free Space Radar units provides for the best fit frequency for every application.

In addition to the new FMCW technology, Heartbeat Technology, a trend-setting and innovative smart sensor diagnostics and self-test concept, is also introduced. These parameters were available previously but were not as accessible as now with Heartbeat. This saves costs in planning, commissioning and maintenance.

Heartbeat Technology
Endress+Hauser has had Heartbeat Technology since 2012, and this technology has led to rethinking instrument verification. Since then, more safety may be achieved at considerably less cost. The new FMR60, 62 and 67 series already features the preconditions for predictive maintenance and documented verification. This means that every measuring point may be verified and documented in situ without any interruption of the process. A simple, pre-defined procedure guides the person responsible for maintenance through the verification procedure and, in the end, the verification results are documented in an unambiguous manner. The SIL test according to the safety manual and documentation saves time and reduces costs, too. An automatically generated verification protocol supports the evidence demanded by regulations, laws or plant standards.

Heartbeat Technology provides instrument and process data thus facilitating trend recognition for predictive maintenance. The goal is always the optimisation in a targeted manner. Therefore, a combination of instrument and process parameters provides all of the important information for the next steps in maintenance or process optimisation.

For more information contact Dhiren Naidoo, Endress+Hauser, +27 (0)11 262 8077, dhiren.naidoo@za.endress.com, www.za.endress.com
The market today is flooded with embedded solutions for the IIoT. End users can now choose from a wide variety of RISC-based embedded computers, single-board computers, and development boards to implement their IIoT solutions. What are the key factors that must be considered when choosing an embedded computing solution for an IIoT application? Should users go for a single-board solution or choose a platform vendor to develop a customised industrial computing solution? Can the development boards handle the complex requirements of the IIoT applications and deliver reliable performance for critical industrial activities?

The IIoT development boards are a safe and economical way to create prototypes of automation ideas. However, when it comes to implementing real-world industrial scenarios, such as the IIoT, a tested and proven industrial-grade embedded computing solution is the best choice because it provides a high-performance, stable, and secure system that can meet most automation needs.

This article lists some key hardware and software advantages of industrial computing platforms over development-board based solutions and the questions to ask when evaluating a computing solution for the IIoT.

The hardware perspective
Engineers often favour development boards over industrial computers because of their low price. As an industrial operator, here are some key points to consider before deciding on a hardware platform for the IIoT.

Is the solution a ready to deploy a platform?
Industrial computers are often ready to deploy platforms that can cater to most computing needs as opposed to development boards, which are bare-bones components that require considerable time and effort to assemble before they can be put to use.

Does it support multiple I/Os of different types, especially serial ports?
Industrial computing solutions typically come with multiple communication interfaces that include Ethernet, serial, and cellular interfaces for maximum flexibility in large-scale industrial deployments. On the other hand, the development boards come with one Ethernet port and a couple of USB ports and usually no serial ports.

Is the solution certified as per the mandatory industrial safety standards?
UL and CE certifications that are a must for equipment deployed in industrial environments are notably absent in most development boards. Industrial computing solutions on the other hand go through rigorous testing to meet various certification requirements and are optimised for different industrial domains.

Does it have ingress protection?
Ingress protection is a key requirement for all industrial equipment in order to survive the harsh industrial environment. Depending on the application, most industrial computers comply with various levels of the ingress protection (IP) standard to provide protection against the ingress of dust and water.

What is the product-warranty period?
Industrial grade equipment is expected to have a long lifetime and a warranty of at least 5 years, which is a norm for most industrial computers. On the contrary, the development boards provide a one year warranty or none at all.

The software perspective
Software components are used in an IIoT system to extend the capabilities of industrial hardware and include the operating system, data acquisition, device monitoring and control, and data conversion tools and applications. The following factors could lower software development costs as well as the time to market.

What is the level of software services and support available for the solution?
Software consulting and services are lifelines that developers depend on. Besides, developing an embedded computing platform requires in-depth knowledge on how these systems work. Most industrial computing solution vendors provide different levels of software service and support to choose from, with some vendors maintaining dedicated teams that work to customise their solutions. Users planning a complex deployment using development boards are left to their own devices and have to rely on the user community to come up with solutions.

Is the platform optimised for industrial requirements?
Industrial computing platforms are optimised for use in different industrial domains. You can choose a solution that best fits your computing needs. In the case of development boards, as with the deployment, any optimisation is the sole responsibility of the user.

How extensive are the utilities and libraries provided with the solution?
The key to the success of any hardware platform is an extensive set of...
libraries and utilities that are available to customise the platform and make it more user-friendly. The key is not just to provide these utilities and libraries, but also constant updates and support. A good platform provider will commit resources to optimise their hardware platform by developing software utilities and libraries.

What is the nature of the long-term support provided?
The typical lifetime of an industrial platform is five years or longer. Industrial platform vendors must therefore commit their resources to the long-term maintenance of their software environment.

The open-platform advantage
Open source software and an open source OS provide developers with maximum flexibility. Make sure that the open platform you choose meets your system requirements and gives you the ability to develop libraries or utilities around it, either in-house or with the help of external consulting firms.

Synaptic Business Automation

Yokogawa Electric has announced Synaptic Business Automation, a new industrial automation and control business concept that expresses the company’s commitment to working with its customers to sustain their industrial automation and control business concept that expresses the value and safety regulations to structural changes in their industries. To remain competitive, they must have the ability to adapt quickly to change.

To guide its efforts to assist companies in meeting such challenges, Yokogawa adheres to a vision statement that reads, “Through Process Co-Innovation,” Yokogawa creates new value with its clients for a brighter future." We help companies improve efficiency and profitability by getting their various business units to work together more effectively and by eliminating barriers that impede the flow of information and goods throughout the supply chain and between companies.

As the Internet of Things gains traction, a digitalisation of processes is underway whereby the use of big data and artificial intelligence is yielding valuable insights needed to make business decisions. The Synaptic Business Automation concept clearly expresses Yokogawa’s commitment to using the latest information technologies and its decades of experience with plant management and industrial processes, portfolio of automation solutions, and consulting expertise to help its customers transform their businesses.

The Synaptic Business Automation concept takes its name from the synapse, a structure in the nervous system that plays a role in the transfer of signals to other parts of the body. Synaptic Business Automation expresses an ideal state for a business whereby the synthesising of data, systems, organisations, knowledge, and supply chains adds value and strengthens competitiveness. The linked data on manufacturing processes, plant operations, human resources, and supply chains can be organised, integrated, controlled, broken down, and analysed to yield insightful decisions at various levels in the organisation, from operations in the field to corporate management.

Ways in which Synaptic Business Automation creates corporate value for customers:

1. Resilient operation
Adapt more flexibly to changes in such areas as health, safety, security and the environment (HSSE), organisational optimisation, and regulatory compliance.

2. Optimised production
Optimise the total expenditure (TOTEX) components of capital expenditure (CAPEX) and operational expenditure (OPEX) over the entire lifecycle of a plant, and improve reliability. Also, directly create value by solving issues and optimising operations throughout a supply chain, thereby enhancing productivity and profitability.

3. Business innovation
Work with specific customers to create new business models that foster manufacturing excellence by such means as supplying cloud-based services that drive collaboration with their customers and suppliers and to introduce environmentally friendly manufacturing practices that are essential for a sustainable society.

Yokogawa has many years of experience in working with operational technology (OT). By combining its in-depth knowledge of plant management, operations, industries, and processes, its portfolio of automation and other information technology solutions, and its consulting expertise, the company is uniquely positioned to create new value. Working together with its customers based on the ‘Co-innovating tomorrow’ corporate brand slogan, Yokogawa is committed to helping them achieve the ideals expressed in its Synaptic Business Automation concept.

For more information contact Christie Cronje, Yokogawa South Africa, +27 (0)11 831 6300, info@sa.yokogawa.com, www.yokogawa.com/za

Moxa’s industrial computers

Moxa’s industrial computers are designed to provide reliable rugged systems that ensure the best user experience for a variety of vertical markets, including smart grid, marine, oil and gas, and rail automation.

The UC-8100 computing platform is designed for embedded data acquisition applications. The computer comes with one or two RS-232/422/485 serial ports and dual 10/100 Mbps Ethernet LAN ports, as well as a Mini PCIe socket to support cellular modules. These versatile communication capabilities let users efficiently adapt the UC-8100 to a variety of complex communications solutions.

For more information contact RJ Connect, +27 (0)11 781 0777, info@rjconnect.co.za, www.rjconnect.co.za

IT IN MANUFACTURING

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Industrial control system cybersecurity


In my articles last year, I pointed out how companies are not doing enough around cybersecurity and how they have a false sense of security about their industrial control system (ICS) networks, thinking that they are not at risk. If you have read these articles, I hope that you have taken away a message in a way that they can understand. The same would apply to a remote access solution. “We have a remote access solution defined in our ICS CSP, but is it secure and are we using 2 factor authentication (2FA) for strong control of accesses to our network?”

The process described above will help you to define your cybersecurity requirements. It will all be in vain though if the board does not readily accept cyber risk as a fundamental risk to the business. A risk assessment will help assist you to relay this message in a way that they can understand.

Grass Marlin

There are many great tools out there that can assist in the analysis of the captured data from the network tap. One of the most commonly utilised open source tools, is Grass Marlin. This is a fantastic tool (and it is free) that will help you understand what assets are currently on your network. It does have its limitations though, and some of the commercial tools have more intelligence around the data, such as continuous asset monitoring and vulnerability detection, but we will explore this later in the year.

Once the data has been analysed and put into a readable structure, the next step is to perform a gap analysis against the defined ICS CSP. A gap analysis in an ICS environment can get a bit tricky, as typically, it might be a case of: “We need a firewall, but, since we don’t have one, it will need to be procured and implemented. So what kind of firewall is required? Do we need a unidirectional firewall, or a next-generation type?”

The same would apply to a remote access solution. “We have a remote access solution defined in our ICS CSP, but is it secure and are we using 2 factor authentication (2FA) for strong control of accesses to our network?”

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Cable-free label printing

RS Components has announced the availability of the new Dymo LabelWriter Wireless, which comes with built-in Wi-Fi to enable cable-free label printing. The printer is suitable for typical general applications in the office such as asset tracking, inventory, mailing, shipping and retail, especially with its ability to print barcodes. It is also ideal for use in industrial applications, including labelling shelves, warehousing, chemical storage, floor markers and equipment inventory.

The LabelWriter Wireless is capable of printing on a wide selection of label tapes used by the existing Dymo LabelWriter printer series. Importantly for industrial applications, the printer can use the existing long-lasting Dymo LW Durable labels, which use an industrial-strength adhesive that is able to stick securely to challenging surfaces such as metal tread plate, textured PVC, wood and glass.

The labels also have a rugged protective coating that prevents peeling and abrasion caused by moisture and solvents, as well as industrial oils and cleaners. In addition to tolerating UV light, the moisture-resistant design can handle damp conditions and up to 85% humidity, as well as withstanding a range of temperatures from –18 up to 50°C. The LabelWriter Wireless is available in black or white, and can print labels directly from Apple Macs, PCs, smartphones and tablets via its built-in Wi-Fi and can easily be added to a network for sharing.

For more information contact RS Components SA, +27 (0)11 691 9300, sales.za@rs-components.com, www.za.rs-online.com

Radiation protection systems go wireless

Omniflex has announced the release of the Teleterm W3 ISA100 Wireless Interface Node. Based on well proven technology and substantiated by the nuclear industry, the Teleterm W3 is the latest device to join the expanding range of products designed to provide a convenient means to network all types of radiation monitors over a secure ISA100 wireless network.

Omniflex has combined all of the required features in a standard COTS product with built-in support for a wide range of instruments including Lab Impex/ Ultra Electronics and Canberra monitors. Simply attach the W3 to the radiation monitor via the RS-485 serial port and within minutes the W3 will be ready to transmit readings and alarms wirelessly to a radiological surveillance or scada system. Other features and benefits include:

• Network all radiation monitors over a secure ISA100 wireless network.
• Up to 500 devices on the network.
• Built-in support for a wide range of monitor makes and types (old and new).
• Compact design to fit alongside monitor.
• LED indication of communication status.
• 9-30V DC powered (12V supplied from the monitors).
• IP55 protected housing.

For more information contact Ian Loudon, Omniflex, +27 (0)31 207 7466, sales@omniflex.com, www.omniflex.com
Trends in process safety systems

By Mark Sen Gupta, principal consultant, ARC Advisory Group.

Market is changing
The global process safety systems market is changing in a rapid and dramatic way. Less industrialised countries continue efforts to grow their economies and build mega plants. These complexes will be interconnected and offer multiple complex product streams. There will be requirements to coordinate ‘in process’ product flows and extend safety shutdown functionalities across multiple units and areas of these facilities.

End users are demanding more information about the functioning and behaviours of their process safety systems, and they want them to be easier and more intuitive to access.

Recognising the need to become more cost-efficient to remain profitable in the changing global environment, many companies are adjusting their business practices to meet the challenges of the ‘new normal’. ARC is also seeing increased efforts to optimise existing operations for maximum availability (by minimising spurious trips) and migrate/upgrade formerly grandfathered systems into a compliant process safety system. Today, proof of compliance is not only mandated, it can also provide benefits by reducing insurance costs.

Cybersecurity remains a key concern
Cybersecurity is top-of-mind for many major safety integrated system (SIS) end users. Stuxnet demonstrated that malware can be deployed by nation states as a weapon of war, as well as by hackers. Such weapons may be extremely difficult to develop, but are also very difficult to trace to an individual, group, or country. SIS suppliers are addressing the cybersecurity threat with active initiatives, either in-house, through partnerships, or both.

Although integrating process automation systems with process safety systems – a growing trend in recent decades – may offer some advantages, many end users are carefully considering just ‘how integrated’ they want their systems to be due to the fear of increased exposure to cybersecurity and other threats.

Integrated vs. separate
Most leading process safety systems’ suppliers today also supply automation systems. Eight out of the top nine suppliers in this market offer a broad range of automation products. As the leading automation systems’ suppliers have entered the safety system business, customer preference appears to be shifting toward using a common supplier and, in some cases, even similar platform technology for both control and safety systems. This approach offers the advantage of reducing engineering costs and project risk.

However, both approaches have tradeoffs. While integrated DCS/SIS platforms can certainly help reduce overall project risk and offer potential cost savings related to reduced engineering, training and spare parts requirements, proponents of separation would argue that this increases vulnerability to both cyber and physical security risks and opens the potential for common-cause failures. There are also varying degrees of ‘integration’ to consider. For example, are the systems just integrated from an engineering, HMI and/or asset management perspective (very likely), or is there actual integration at the control logic level (not very likely)?

Expanding scope of supply
More industry participants are expanding the main automation contractor (MAC) project concept to include the electrical equipment and systems. Regardless of the project scope, however, there is an increasing trend to look to a third party for safety consulting services. End users are losing the ability to provide these services in-house. These services extend beyond configuring and installing the safety system, to pre-project work like determining the appropriate safety integrity levels (SILs), and after-project work like maintenance support, testing, and validation.

Recognising that many previous process safety system projects have failed, suppliers are adopting new technologies and standards to improve process safety system project execution. Some of the key technological changes occurring in the market include a growing use of new I/O technologies, increasing adoption of standards, and increasing use of virtualisation. The overarching goal of these changes is to make process safety systems easier to implement and maintain.

While ARC does not expect the safety market to embrace virtualisation of safety logic any time soon, over the long term, it is possible that virtualisation technologies will prove to be robust enough for this type of application.

ARC also sees an increased focus on the entire safety lifecycle. More users are beginning to observe that most safety failures come from field devices connected to the safety system, rather than the safety system itself. This understanding is driving more end users to demand safety lifecycle management software functionalities so they can not only operate their plants safer, but also prove it!

Regulators are also getting more involved in the safety lifecycle and becoming more proactive by working with major end users to ensure that they comply with standards and demonstrate understanding of risks and corresponding safeguards to manage/mitigate identified risks before accidents can happen.

However, much more still needs to be done to make industry aware of the risk and reduce both the frequency and severity of process safety-related incidents.

ARC has recently updated both its market research (https://tinyurl.com/ycc2rctm) on this dynamic space for the supplier community and prepared an updated technology evaluation and selection guides (https://tinyurl.com/ydaz3dh) for end users.

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

The automobile industry is heavily automated and can be hazardous if not safeguarded properly. Ensuring safety whilst delivering productivity is vital to the industry and therefore safeguarding operators as well as guaranteeing that processes have optimum efficiency is a constant challenge for operating companies.

The Fortress range of safety interlocks is specifically designed for such applications and has been specified by many global automotive manufacturers and their equipment providers to ensure the strict safety procedures are enforced by means of electrical and mechanical interlocks.

Deebar has exclusively represented Fortress Interlocks for over 35 years in Africa, and assists many large manufacturers in the automotive industry to create workplaces where their employees are safeguarded from injury and equipment is protected from damage. Various applications are catered for, including automated paint systems, engine assembly, welding cells, seat buffer cells and any other processes that involve a series of robots.

The interlocking process ensures that operators and or maintenance personnel can only enter the guarded area once all machinery is isolated and has come to rest. Guard doors are interlocked with safety gate switches such that power to all moving parts is isolated prior to opening the actual guard doors.

Easy installation and configuration

The Fortress Interlocks have a unique modular construction that allows easy configuration and provides total electro-mechanical solutions for practically any safeguarding application up to EN ISO 13849-1, Category 4, PLe (SIL3). This range of safety component products has been approved by TUV SUD.

Fortress offers a range of fully integrated safety interlocks, including solenoid and non-solenoid safety switches complete with a host of additional options including key control modules, internal and escape release, redundant sensors, lock out/tag out and push buttons, e-stops and indication lights for enhanced functionality, all assembled in one device. The robust construction of this range makes it ideal for use in a wide range of industrial applications when safety, strength and reliability are of paramount importance.

The flexibility and reliability of the Fortress range has been a contributing factor to many large motor companies such as Nissan and Ford choosing Fortress as their interlock of choice. With production increasing and upgrades to factories taking place, the Fortress Slimline range has been selected as the favourite due to its robust 10 kN retention force on the actuator and push button control functionality, which allows for easy control of the cells whilst ensuring safety standards are met.

For more information contact Deebar, +27 (0)11 873 4332, ask@deebar.co.za, www.deebar.co.za

Protection for wind turbines

Wind energy is a clean and renewable form of energy, which is also drought-resistant and almost emission-free. However, as South Africa’s renewable energy industry continues to explore wind energy as a potential resource, considerations around possible lightning strikes need to be factored in. Across the globe, whether on- or offshore, DEHN protects wind turbines against disturbances resulting from lightning currents and surges, and provides components and solutions relating to safety equipment.

The cost of constructing and operating wind power plants must be amortised within the timeframe of an average 20 years of operation. Constant monitoring and foresighted maintenance are essential. DEHN detect, available from lightning and surge protection expert, DEHN Africa, is designed to measure lightning currents and detects not only impulse currents but also the dangerous long stroke currents.

Damage resulting from a lightning strike does not necessarily lead to the immediate failure of the turbine, and so lightning events often remain undetected. Especially in the case of upward flashes, the initial long stroke current flowing is only a few hundred amps, and this can be the main cause of melting, for example on the receptors of rotor blades. The resulting subsequent damage can be severe.

DEHN detect allows the operator to assess the situation and ask the following important questions: “Was the lightning strike harmless or does the turbine need to be switched off and inspected in order to rule out damage to the rotor blades or other components?” As well as the total current in the system, DEHN detect registers individual partial currents in the rotor blades. The provision and management of data is simple and convenient via web applications in the cloud. DEHN detect allows for the monitoring of several plants or even entire wind parks. DEHN detect can be installed directly by the wind turbine manufacturer or retro-fitted in existing plants. Installation is quick and easy and can be adjusted to the specifications of the individual turbine.

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Even where ambient conditions place the highest demands on material and technology, direct access to process information is essential. To function here, HMI systems must be precisely tailored to the requirements of the process plant. This especially applies where potentially explosive production areas pose an additional challenge. And in all this, the HMI solutions must also be compact and light, in order to save space in installation. With the VisuNet GXP range, Pepperl+Fuchs has developed a modular component system with ATEX and IECEx Zone 1/21 approval to meet these requirements.

PC solution extends modular system

At the beginning of the year, the VisuNet GXP product family was grown to include a PC solution. The new computing unit is optimally suited for mechanical engineers, for example, who wish to use their machines in Zone 1/21 or Zone 2/22. Not only do the HMI solutions have all the approvals necessary for use directly in hazardous areas, but they impress with their low weight, compact design and flexible installation options. This is unique on the market in this combination. The new PC unit features an Intel quad-core processor and an open Microsoft Windows operating system. The user therefore has the option of installing their own software packages such as scada applications in order to visualise and control applications in hazardous areas. A large number of serial interface options such as RS-232, RS-485 and Ethernet enable direct access from the hazardous area to the PLC or other peripheral devices.

In addition to the PC unit, each VisuNet GXP also has a powerful AC or DC power supply and a display unit. A new, even more compact, 19 inch version is available, as well as the 21,5 inch system. The multitouch display is located behind hardened protection glass and is not only extremely durable and scratch-resistant, but also optimised for use while wearing gloves. The 10-point multitouch sensor enables modern, touch-optimised user interfaces to be used, similar to those on smartphones and tablets. This sensor also incorporates important safety features for critical processes. For instance, it is possible to specify that an application can be started only by touching two contact points simultaneously, making inadvertent activation virtually impossible. Energy consumption is also extremely low thanks to LED backlighting.

Optimised for life science applications

The GXP series also offers maximum mounting flexibility for efficient operation. The extremely compact screen, power supply and computing units are optimally suited for space-saving panel-mount installation in machines with a minimal installation depth. Installation is made significantly easier by the low weight of just 19 kilograms, enabling installation on a practical mounting arm. Particularly interesting for mechanical engineers who produce for the life sciences area is the rear panel. Mounted flush with the machine housing, this is very easy to clean and meets GMP guidelines. A particular advantage is the compatibility with previous devices from the VisuNet EX1 series. Specifically, the identical hole pattern means the new VisuNet GXP devices with 19” displays even fit into existing VisuNet EX1 installations.

The devices are resistant to the chemicals and detergents common in industry, as stainless steel is used for all mountings and housings. All the surfaces are designed without gaps or horizontal surfaces to prevent an accumulation of liquid, dirt, or bacteria and to ensure fast and easy cleaning. A variety of use applications are provided for by the dustproof, IP66-rated design, lack of moving parts like fans and the extended temperature range (-20 to 50°C).

Like the rest of the GXP product family, the new panel PC also offers enormous maintenance advantages thanks to its modular construction. Costs can be reduced substantially here, since components can be replaced on-site by the user in the event of a fault without affecting hazardous area approval. Downtime is therefore reduced to a minimum. The modular system is rounded off by a multitude of further approved components such as keyboards, barcode reading devices and a wide range of standard housing and mounting options. If something still is not suitable despite this wide selection, it can be made suitable: in worldwide solution engineering centres (SECs), experts provide custom solutions made to suit specific applications on site. Even the communication technology is tailored here to meet customer and specific application requirements.

Convenient remote management option

Depending on the sector, customer requirements and application, a new generation of smart, thin client-based HMIs is available in addition to PC-based devices: the VisuNet...
remote monitors with RM Shell 4.1 firmware. In large automated plants with a distributed control system, it often makes sense to deploy multiple HMIs to control processes directly at the relevant location. For this purpose, the GXP modular system offers thin client technology with identical mechanical benefits. Each of these devices is equipped with the latest version of RM Shell 4.1. Security, reliability, and user-friendliness were the focus in the development of this firmware. A very well-designed tool has been created which concentrates on essential equipment aspects and requires no specialist IT knowledge. Its ease of use and convenient user interface make it incredibly easy to integrate the device into the process control system. The Windows desktop has been completely replaced by RM Shell 4.1, so that only those aspects of setup are displayed which are necessary for configuration.

For mechanical engineers with operations worldwide, the additional VisuNet Control Center software is a particular highlight. Through this, users can centrally administer thin client solutions with RM Shell 4.1. Remote monitors, supplied in plants around the world, can be set up, configured and monitored from a central, local workspace through IP-based communication. If necessary, the remote monitors can be accessed easily from a remote location, minimising the time- and cost-intensive need to deploy service staff to site. Overall, this highly-flexible modular system represents an excellent solution for every application scenario in hazardous areas.

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Ex and marine approval for LSIS equipment

Due to the dangers prevalent in petrochemical, mining and marine applications there is a need for equipment that is non-volatile and would by extension, not be the cause of explosions and fires. This standard in the marine environment is known and marine approval is underwritten by various insurers and organisations worldwide to ensure a universally compliant safety standard for shipping.

On the other hand, Ex-rated equipment refers to equipment that is classified as safe to use in areas where fire hazards are a real threat. Generally, equipment that is not marine and Ex rated could emit small sparks or work at temperatures that have the potential to ignite gasses resulting in disaster.

LSIS has for years been actively interested in getting Ex rating and marine approval and have a PLC range, the XGI, the LSLV-Is7 frequency inverter and IXP HMI which are marine approved.

The IXP50 and IXP70 HMIs have now been Ex rated. The marine approvals come from DNV-GL, Lloyd’s Register, ClassNK, KR, RINA, ChinaCS, Bureau Veritas and ABS and the Ex ratings for the IXP from clmEx and IECEx.

Some of the key features of the IXP range include an ARM Cortex-A8 Core (32-bit RISC), 1 GHz processor, 256-512 MB operating RAM and 128 MB programming space. The backlight is LED with more than 60 000 hours of operation time and 16 to 24 bit colour capability. The HMIs have built-in proximity sensors which turn on the screen backlight when approached by the operator and then off once he has moved away. This HMI range has RS-232, RS-485 and Ethernet installed as standard, and supports over 100 variations of communication protocols for the following OEM products: LSIS, LS Mecapion, BACnet, BYD Auto, CAN in Automation, Control Techniques, Daewon GSI, Dasarobot, Delta Electronics, Digital Electronix (Pro-face), Fuji Electric Systems, GE Intelligent, HanYoung NUX, Higen Motors, Hitachi, Hyundai Elevator, KDT Systems, Keyence, Koyo Electronic, KTurbo, Lenze Automation, Panasonic Electric, Parker, Profibus International, Beckhoff, TSSI, Mitsubishi Electric, Omron, Rockwell Automation, RS Automation, Schneider Electric, SEW Eurodrive, Siemens AG, Sprint Electric, Yaskawa Electric, Yokogawa Electric and FATEC Automation Corporation.

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Further to my previous articles: ‘How to calculate an intrinsically safe loop approval’ (http://www.instrumentation.co.za/7571a) and ‘Calculating intrinsically safe loop approvals – Part 2’ (http://www.instrumentation.co.za/7782a), we now consider the impact of Gas Group on cable lengths for IS loops.

In Part 2, I discussed using Exic for Zone 2 applications ‘Intrinsic safety in normal operation’ i.e. with no safety factor required.

To repeat, firstly and importantly, there is a misconception that the Co values are defined by the design of barrier/isolator. The Co value is actually defined in IEC/SANS60079-11: 2012 Table A.2 page 96.

So, any barrier/isolator with 28 V safety description will have Co = 83 nF (Zone 0/1; IIC). In practice, Co will define the maximum allowable cable length for most cases. However, as explained in Part 2, using Exic where applicable is one method to have longer cable lengths.

Gas Group classification impacts Co parameter as per Figure 1. Figure 2 shows an Exia loop with Co = 83 nF. The max cable capacitance Cc = 63 nF. With a typical cable capacitance of 95 nF/km, this would equate to maximum cable length of 660 m.

If the loop was Exic, then Co = 272 nF, so Cc = 252 nF would theoretically allow 2,5 km of cable i.e. no longer a limiting factor. (The limiting factor in this system is likely to be operating voltage at the end of the cable being high enough for the transmitter to work.)

If the Gas Group were IIB then Co = 650 nF, which eliminates capacitance as a limiting factor.

Conclusions
1. For installations requiring long cable runs, classifying the area as Zone 2 offers significant benefit.
2. Alternatively, a IIB (or IIA) classification is another way of allowing longer cables lengths.

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Factors affecting max. cable lengths for IS loops (SANS60079-11:2012 Table A2 pg. 96)

<table>
<thead>
<tr>
<th>Voltage</th>
<th>for Group IIC apparatus</th>
<th>for Group IIIB apparatus</th>
<th>for Group IIA apparatus</th>
<th>for Group I apparatus</th>
</tr>
</thead>
<tbody>
<tr>
<td>V</td>
<td>with a factor of safety of</td>
<td>with a factor of safety of</td>
<td>with a factor of safety of</td>
<td>with a factor of safety of</td>
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<tr>
<td></td>
<td>3,1</td>
<td>3,1</td>
<td>3,1</td>
<td>3,1</td>
</tr>
<tr>
<td>Zone 0</td>
<td>0,372</td>
<td>0,385</td>
<td>0,385</td>
<td>0,385</td>
</tr>
<tr>
<td>Zone 1</td>
<td>0,372</td>
<td>0,385</td>
<td>0,385</td>
<td>0,385</td>
</tr>
<tr>
<td>Zone 2</td>
<td>0,372</td>
<td>0,385</td>
<td>0,385</td>
<td>0,385</td>
</tr>
<tr>
<td>Zone 3</td>
<td>0,372</td>
<td>0,385</td>
<td>0,385</td>
<td>0,385</td>
</tr>
</tbody>
</table>

- Zone 0, 1 (Ex ia or ib) requires 1.5 safety factor
- Zone 2 (Ex ic) does not require safety factor
- IIC Zone 0, 1 - 0.385 nF Zone 2 - 2,5 km
- IIB Zone 0, 1 – 0.385 nF Zone 2 - 6.6 km
- IIA Zone 0, 1 - 0.385 nF Zone 2 - 2.15 km
- Remember R/L if Lo > Li + Lc fails!

Exia - Verification of safety compatibility

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Figure 1: Co values.

Figure 2: IIC IS loop for Zone 0/1 (Co 83 nF).
Room integrity testing

Alien Systems and Technologies (AST) is the first company in Africa to offer room integrity testing (RIT). The company's performance in the industry is supported by its highly qualified, specialised team, which works closely with Retrotec, the world's leading manufacturer of building diagnostic tools. AST provides tailor-made fire protection solutions and extinguishing systems. RIT forms the core of this service, focusing on the secure retainment of gaseous agents in protected spaces, ensuring all rooms at hand are meticulously tested for their integrity.

RIT is a simple and effective way to measure the potential leakage of a confined space. AST adheres to its own protocol to ensure that the space is fully prepared prior to testing. In order to retain a gaseous fire suppression agent, the walls and slabs are inspected for leakage points and all areas of concern are pressure sealed and fitted with fire retardant materials. A large fan is then installed to pressurise the room being tested. The air speed is then adjusted according to flow pressure to obtain the equivalent pressure exerted during a fire suppression system charge. Once achieved, the room is depressurised by reversing the fan to draw the air from the space. The pressure readings are then evaluated to calculate the leakage area.

This method successfully determines the worst case leakage potential for a room, drawing air throughout the space in order to predict the descending interface of the suppression agent. The concentration hold-time is identified by the length of time taken for the descending compound to reach the minimum protected height. Fire extinguishing systems require this mandatory service every 12 months, forming part of the new guide to the national building regulations. Same-day response times for repairs and re-tests, cost-effective compliance tests to the necessary standard, as well as onsite diagnoses of leakage areas form a few of the key benefits of room integrity testing.

A comprehensive design service is offered by AST, including a client consultation to determine the level of detection or protection needed, as well as a design that meets insurance company specifications. Its team of highly qualified fire and mechanical engineers designs the tailor-made system, provides build-layouts and schematic drawings and develops tender specifications.

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Report on temperature control of an autoclave.

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 (0)82 440 7790, michael.brown@mweb.co.za, www.controlloop.co.za

I was recently asked to help with a client who treats a product in an autoclave and was complaining that they always got overshoot on a step setpoint change to holding temperature. The following is taken from my report:

The autoclave is a special case of what is often referred to as ‘Batch Temperature Control’ where a load is placed inside a well insulated chamber, and the temperature setpoint is then stepped up to a desired holding or soaking temperature. The two main control requirements are normally:

1. No overshoot is allowed because as there is no cooling and the heat loss from the chamber is very small. Therefore, if an overshoot has occurred, it will take an extremely long time for the temperature to drop back to setpoint, even although the control valve is fully closed.

2. The PV must get to SP as quickly as possible to allow more production through the unit.

Balancing process

Refer to Figure 1. The heating of a unit like an autoclave is known as an ‘integrating,’ ‘ramping’ or ‘balancing’ process, which is similar to control of level in a tank. The only time that the level in a tank can remain constant is when the inflow and outflow are equal. If the flows are not equal, the level will always be ramping up or down. Therefore the control requirement for a constant PV is to get the inflow and outflow to be equal, or ‘balanced’.

In the case of the autoclave we need to keep the heat inflow equal to the heat outflow for the temperature to remain constant. However, the significant and really unique point of this type of process is that the heat flow output from the chamber is zero in the short to medium term. This means that to have a constant temperature the valve needs to be shut or very close to shut, otherwise the

---

**Figure 1.**

**AUTOCLAVE TEMPERATURE CONTROL**

Heat out is effectively zero in short to medium term, as heat loss from autoclave is very small.

Heat in.
temperature will keep rising. Therefore the ‘trick’ is to open the valve fully on the setpoint step change to heat the vessel as quickly as possible, and then to keep it fully open until there is exactly sufficient heat energy in the vessel to get the temperature to setpoint. By then the valve should already have returned to the fully closed position, as the PV will still rise for a short while after the valve is closed.

Normally one uses proportional (the P term) plus integral (the I term) control on most processes. The only purpose of the I term is to ensure that the PV does get to SP without offset. However, there is a problem when using the I term in the controller on an integrating process. This is because with the particular dynamics inherent to integrating processes, if one uses the I term in the controller the PV will always overshoot the SP on SP step changes.

Thus the I term cannot be used on the controller for this application as overshoot is not allowed.

Therefore one has to use a controller with the P term and no I term.

Please note that in certain batch temperature processes there is sometimes an additional dynamic which cause the PV to respond initially in a ‘lag’ fashion on the SP change (it curves up into the ramp). In these cases it is essential to also use the derivative term (the D term) in the controller to cancel out the lag. However, in the case of the autoclave under consideration the temperature starts ramping at a constant rate within a relatively short time after the SP step change has been used. Thus the D term will not help in this case.

We are therefore forced to use a P only controller.

Tuning for P only control

To tune the controller is not as difficult as one might initially feel. An interesting fact is that with an integrating process with effectively zero heat loss, even with a P only control, the PV must at least always get to SP and cannot end up below SP. The reason for this is that with zero heat output from the unit, if the PV is less than the SP the output of the controller must be above zero. (Controller output = P gain x Error). Thus the valve will not be closed and heat will still keep entering the unit and cause the temperature to continue to rise.

Therefore, the only problem that we can encounter with the P only control is that we may end up above setpoint i.e. with an overshoot.

So essentially the trick in tuning such a process is to do tests with SP step changes starting with low P values, and increase the gain on each test until we get to SP in the shortest time without overshoot.

An important point with P only controllers is that because there is no I term, the controllers must have an adjustable bias, which allows one to move the PD (controller output) up or down manually by the bias value. (Most P only controllers default to an initial bias value of 50%). However, in this case the bias must be set at zero percent, so that the PD is at zero when the PV = SP. This ensures the valve is closed when the PV is at SP and there is zero error.

It is also very important with this control is to ensure that the valve calibration is correct so that it is fully shut at zero PD, and immediately starts opening when the PD moves up from zero. This is critical.

If the holding (soaking period) is very long there may be enough heat loss from the unit to cause the PV to start dropping when the valve is fully closed. Generally the P only term will be able to limit this drop, as usually on units like autoclaves the tuning ends up with a pretty high P gain. However, in certain cases people switch on the I term after the PV has reached the setpoint. This ensures the valve will definitely open enough to keep the PV at SP.

After implementing the recommendations my client kindly sent me the following screen shots which are actual trends captured from his scada, and which shows how well the P only control strategy worked:

Figure 2 shows the response to a step change in setpoint with P+I control, and Figure 3 the response with properly tuned P only control.
CONTROL SYSTEMS

New improved plant information management system

Yokogawa has released the Exaquantum™ R3.10. This latest version of the Exaquantum plant information management system comes with stronger security and improved compatibility through the support of OPC Unified Architecture (OPC-UA), the latest OPC communication standard. Manufacturers have an increasing need to store and analyse large amounts of data on temperature, pressure and other variables that can be used to improve the efficiency of plant operations. To facilitate the collection and storage of this data, there is thus a rising demand for plant information management systems (PIMS). Yokogawa has developed the Exaquantum PIMS to meet this need, and has been improving its functions. The Exaquantum PIMS can be used in a wide range of industries, including oil, refining, petrochemicals, iron and steel, non-ferrous metals, electric power, gas, pulp and paper, food, pharmaceuticals and water treatment.

With the rising use of information technology in production management and control applications, maintaining the security of plant information and control systems is a growing challenge. As companies seek to introduce the latest network technologies, security becomes an even more pressing concern. To meet such needs, Yokogawa has added support for the latest communication standard to Exaquantum R3.10 and has upgraded its security features. Enhancements include:

• Support of OPC UA for improved security and compatibility with other systems:
  Exaquantum R3.10 supports OPC UA (client) and thus can now securely exchange data with a wider range of data sources, including OPC UA-compliant devices such as the Yokogawa SMARTDAC+ series data acquisition systems.

• Strengthened system security: Based on a review of the vulnerabilities in the previous version of this software, the program paths (routes to files and folders) and the authorisation of access rights have been tightened in Exaquantum R3.10. Exaquantum is now less vulnerable to computer viruses and cyber attacks.

• Support of the latest operating systems: Exaquantum R3.10 supports the latest versions of operating systems and other kinds of software, including Windows Server 2016 (a server operating system), Windows 10 Enterprise 2016 LTSB (a PC operating system), and Microsoft SQL Server 2014 (a relational database management system).

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Encoders with energy-harvesting technology

Turck has announced an expansion of its encoder offering with the release of Compact Magnetic Absolute Multiturn Encoders. Available in analog, CANopen, and SSI output, these compact devices are ideal for OEM applications where space is limited, and where reliability and pricing are a factor. The cost-competitive nature of this product will also see it used in a wide range of general position applications.

“These are the first encoders from Turck with energy harvesting technology,” explained senior product manager for sensors, Marty Cwach.

“No longer are there worries of battery life or mechanical gears to track revolutions in these magnetic multiturn devices. This is the next great step in providing our customers with a complete portfolio of Turck encoder solutions.”

Turck’s compact magnetic absolute multi-turn encoders come in a 39 mm diameter housing. The standard product line offers IP65/IP67 protection, while the robust series includes IP66/IP67/IP69K and 316 stainless steel materials. Both versions are able to withstand harsh environments with water and chemical spray, or even high shock areas.

For more information contact Brandon Topham, RET Automation, +27 (0)11 453 2468, brandon.topham@retautomation.com, www.retautomation.com
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Complete Process Control Solutions
In automotive manufacturing applications, image processing has often been handled separately and sometimes even outsourced to external system integrators. Meanwhile, PLC programmers have branched out into numerous disciplines, including motion control, safety technology, measurement technology and robotics. It is possible today to combine all of those functions in a single control system on one computer. However, image processing has typically remained in a black box on a separate high-performance computer, with specific configuration tools and programming languages, or it is implemented directly in specially configured smart cameras. The downside to using a separate computer is that even the smallest changes require input from a specialist instead of the PLC programmer, resulting in avoidable costs. In cases where a third-party system integrator is involved, it also means that the expertise remains external. In addition, the communication between image processing and the control system has to be regulated, which can be an error-prone process. As a result, an exact timing in image processing could not be ensured. External processes, such as the operating system, can affect the processing time and the transmission time, so the results may not reach the controller in the required time span.

The new TwinCAT Vision software combines both worlds into one integrated system. The configuration, especially of the cameras, is carried out in the same tool as the configuration of fieldbuses and motion axes. For programming, the familiar PLC programming languages can be used. In this way, substantial engineering cost savings can be achieved, since there is no need to learn special programming languages, and no special configuration tool is required. The challenges of communication between image processing and control are not only eliminated, but image processing and control components can directly communicate with each other, opening up entirely new application possibilities. Everything is integrated into one tool and one runtime environment – this is the core innovation offered by TwinCAT Vision.

**Architecture**

PC-based automation combines all control functions on a PC platform and it therefore inherently benefits from a Gigabit Ethernet interface. Based on Gigabit Ethernet, GigE Vision is a communication standard that enables reliable and fast transmission of image data from cameras. TwinCAT Vision provides a real-time capable driver for the Ethernet interface, which makes image data available directly in the controller memory. With support for GigE Vision, TwinCAT Vision is also an open system that makes it possible to use cameras from a large number of manufacturers.

The first step after a connection is established usually involves configuration of the camera. Manufacturers of cameras with the GigE Vision interface provide a configuration description in GenApi format. The TwinCAT Vision configuration tool reads the parameters and makes them available to the user in a clearly arranged manner. Configuration changes, such as adjusting the exposure time and setting a region of interest, can be made quickly and easily, and the results can be observed in the live image of the camera.

In addition to the camera configuration tool, TwinCAT Vision provides another tool for geometric camera calibration. This determines the parameters for describing the mapping from image coordinates to real-world coordinates and vice versa. It also makes it possible to relate positions in the images to real-world coordinates and to convert measurement results from pixels into the metric system. In addition to perspective distortions, non-linear distortions of the lens are taken into account, which can be observed in the form of visible deformations in the image.

As part of the camera calibration, one or more images of a suitable calibration pattern are required initially. These images can be acquired directly in the engineering tool, or existing images can be imported. After specifying the calibration pattern, the parameters are calculated automatically. In addition to the standard 2D patterns, such as the chessboard pattern or the symmetrical or asymmetrical circle patterns, users can also read in their own patterns. These may also be 3D patterns. As an alternative to using the calibration tool, camera calibration can be performed in the PLC.

The raw images are transferred directly from the camera to the router memory of the PLC via GigE Vision. For this purpose, the camera has to be set into image acquisition state and, depending on the camera configuration, individual images must be triggered. The software function block FB_VN_GevCameraControl is available for this procedure.

For very precise trigger timing, the timestamp-based EL2262 output terminal is available in the Beckhoff I/O system, which can be used to send a hardware trigger signal with microsecond accuracy to the camera. Since everything takes place in real time in a highly accurate temporal context, image acquisition and the positions of an axis, for example, can be synchronised with high precision – a frequently occurring task for PLC programmers.

Many cameras can also send output signals at previously defined events, such as the start of image capture. These signals can be acquired with a digital input terminal from Beckhoff and then used in the PLC for precise synchronisation of further processes.

TwinCAT Vision offers a new image processing library in the PLC that contains numerous image processing algorithms. For example, images can be scaled or converted during preprocessing to the desired colour space, and certain characteristics can be highlighted or suppressed by means of filter functions.

The image can then be binarised by means of thresholding, followed by contour tracing on the resulting image. The contours found in this way can be filtered, based on their characteristics, resulting in a selection of interesting image contours or image regions, which in turn
CONTROL SYSTEMS

are suitable for object identification and measurement. With a previously calibrated camera, the feature points can also be transformed back into the world coordinate system, so that position and measurement data can be specified accurately.

By integrating TwinCAT Vision into the TwinCAT real-time environment, the timing of image processing functions can be monitored via watchdogs, which interrupt the functions after a defined period of time or at a certain point in time from the start of a processing cycle. At the same time, the user is provided with any partial results that may be available at the time. In addition, suitable image processing functions can be automatically allocated to multiple CPU cores for parallel processing by means of so-called job tasks, so that TwinCAT Vision makes optimum use of the multi-core capabilities in TwinCAT 3.

During analysis and visualisation of the results, all images can be represented in the form of images and not only in the form of binary data. Before this, it is possible to write and draw results, such as position information, into the images. Exemplary use cases include colour-coded marking of the filtered image contours or the good/bad marking of parts. The user is only limited by the image boundaries. The images can be displayed directly in TwinCAT Engineering in the so-called ADS Image Watch or for the end user in TwinCAT HMI.

PLC and image processing in one universal tool
TwinCAT Vision combines classic automation technology with image processing, making it especially user-friendly. On the engineering side, camera configuration and geometric camera calibration are carried out directly in TwinCAT Engineering. No other tools are required. Image processing is programmed based on the languages used by PLC programmers, i.e. in IEC 61131-3, which means that no special programming language has to be learned. In addition, it is possible to respond directly to the results of image processing in the PLC, right away in the next line of code. By triggering the camera from within the real-time environment, image capture and PLC or motion control can be fully synchronised. The image processing algorithms are computed in real time in TwinCAT, ensuring task-synchronous execution and monitoring in real time via watchdogs. TwinCAT Vision leverages the multi-core capabilities of TwinCAT 3 to automatically execute algorithms on multiple cores whenever they are available. No special programming by the user is required for this parallelisation capability.

TwinCAT Vision is aimed at users who are faced with the challenges and opportunities of having to handle vision tasks within the control system or wanting to do so. Through seamless integration, TwinCAT Vision is easy to operate and program. Naturally, it is also suitable for users who need a high degree of synchronisation among image processing, PLC and motion control. Since delays in processing are eliminated and the processing of algorithms is time-monitored, the system is able to respond directly and deterministically.

Classic image processing tasks such as finding and recognising or measuring parts can be performed easily with TwinCAT Vision. In addition to PLC, motion, robotics and measurement technology, TwinCAT users can now add image processing to the list of integrated functions in the TwinCAT system.

For more information contact
Michelle Murphy, Beckhoff Automation, +27 (0)11 795 2898, michellem@beckhoff.com, www.beckhoff.co.za
Advanced software solution for drives

Parker Hannifin now offers an advanced software solution for its AC10 range of compact variable speed drives (VSDs) for industrial motor control applications. It has comprehensive yet user-friendly programming capabilities and is available to download free of charge with every AC10 purchase.

The AC10 compact VSD from Parker is a simple, proven and economical solution to everyday motor control applications requiring speed or torque control within the power range of 0.2 to 180 kW for IP20 and 0.4 to 90 kW for IP66. Typical uses range from pumps, fans, conveyors, centrifuges, mixers, machine tool spindles and roller doors, through to packaging, textile, strapping, labelling and industrial washing machines. Commonly available software solutions for such applications are typically relatively basic. DSE Lite is a more complete package and combines impressive functionality with ease of use through an intuitive, graphical user interface and straightforward block programming.

As an example of its capability, DSE Lite allows customers to create, parameterise and configure user-defined applications, as well as parameterise and connect fixed motor control blocks. It also offers real-time monitoring and charting, while further features are designed to reduce the time and effort required to install, set up and commission the drive via the integrated keypad.

Application templates are available across the complete range, with AC650V-compatible function blocks that include PID, raise/lower and logic/value parameters. Other new features are enhanced sequencing logic, improved motor control at low speed and help files for every function.

For more information contact Lisa de Beer, Parker Hannifin SA, +27 (0)11 961 0700, lisa.debeer@parker.com, www.parker.com/za

Specialised industrial electronics

GHM Messtechnik South Africa supplies industrial electronics that meet the ever increasing requirements by industry for all systems and components involved in the production process. Their precision instrumentation reduces downtime whilst maximising process efficiencies. “The cost savings and associated competitive ability of our industrial electronics plays an important role when our customers are considering the modernisation of existing machinery or processes. We believe that GHM Messtechnik’s specialised instrumentation easily addresses these concerns as a result of our continued investment into state-of-the-art research and development methodology and production processes,” said managing director, Jan Grobler.

The upcoming Industry 4.0 industry program requires a deeper focus on better integration of customer requirements. Throughout the value chain process values in production processes will have to be combined without any loss of information that is relevant to users on site. “Through in-depth knowledge of our customer’s ever evolving requirements, GHM Messtechnik constantly enhances its ranges of specialised industrial instrumentation in order to supply highly efficient devices and systems for the next industrial revolution,” Grobler added.

The range of industrial electronics extends from process value detection to signal processing, display, control and regulation, to actuators for intervening in the process. The GHM Messtechnik range includes temperature measurement transducers, universal transmitters, universal isolating amplifiers, switch amplifiers, limit value switches and thermal limiters. All are highly specialised, quality instruments with high accuracy performance.

High operating efficiency is achieved throughout all areas of the product life cycle via:
• Space saving assembly
• Quick and uncomplicated integration
• Short wiring times
• Simple commissioning without software
• Use of intuitively operated configuration software
• Clear process information for operators in order to minimise downtimes
• Fulfilment of necessary regulations such as EN 14597 or SIL
• Long service life

“The quality of our instrumentation and their successful application across industries such as food and beverage, plant and machinery construction, industrial and laboratory furnace construction, oil and gas, ship construction, plastics, chemical and pharmaceutical is well documented. It is German precision, reliability and accuracy at its best” concluded Grobler.

For more information contact Jan Grobler, GHM Messtechnik, +27 (0)11 902 0158, info@ghm-sa.co.za, www.ghm-sa.co.za
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The rapidly growing industry requires affordable high quality automation products to meet demanding manufacturing requirements. Many users have already chosen Autonics as their answer.

Autonics, the leading manufacturer of sensors, controllers, and measuring instruments in Korea, provides global stand quality automation products in over 100 countries around the world. With highly innovative technical research centers, state-of-the-art manufacturing facilities and comprehensive end-to-end quality control systems, Autonics provides over 8000 automation products to raise the efficiency of users around the globe. Find out how Autonics can help you and your business.

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Siemens expands Motor Module series

The Booksize Motor Module portfolio has been further developed to include compatible new C and D type Sinamics S120 Booksize Motor Modules. Siemens has added a number of new devices to the existing 3-30 A range. The 24 A, 45 A and 60 A modules are now available with double overload factor (continuous C-type) and the 24 A modules are additionally available with triple overload factor (discontinuous D-type). With a 33 percent narrower fit than the existing variants, the new 45 A and 60 A devices are extremely compact, enabling significant space savings in the control cabinet. The maximum current in the 45 A devices has also been increased from 85 A to 90 A, while the 60 A devices now come with a 120 A maximum current instead of the previous 113 A. A completely new addition to the series are the 24 A devices, which will be available as either a C or D type. This closes the gap in the portfolio between 18 A and 30 A options.

Sinamics S120 is a modular drive system for high-performance motion control applications in machine and systems engineering. Users can select from a wide range of coordinated components and functions and combine them to meet their own specific requirements. The Motor Modules (power units) are an integral part of the S120 drive system.

For more information contact Jennifer Naidoo, Siemens Digital Factory and Process Industries and Drives, +27 (0)11 652 2795, jennifer.naidoo@siemens.com, www.siemens.co.za

High precision gap checker sensor

The recently launched ISA3 series of gap checker sensors from SMC offers several significant benefits to customers, including lowered air consumption, increased precision and reduced cabling work. The range of applications is expanding to cover faster, more precise processes in quality control and in-process quality assurance.

Two-line, digital display with three colours

For improved visibility, the gap checker sensor has a two-line, three colour digital display. Brian Abbott, SMC product manager explains that thanks to this feature, readings are possible from some distance or at a brief glance. The ISA3 sensor is designed for quick and simple installation as well as easy operation and is extremely robust and maintenance-friendly.

The switching points can be adjusted in just three easy steps. “A button lock function also prevents settings from being unintentionally changed. Customers utilising the SMC Gap Checker have realised an increase in their process productivity and safety,” says Abbott.

The sensor of the ISA3 series also scores points with its compact dimensions and reduced weight. They are particularly suitable in confined assembly conditions.

Query distance up to 0,01 mm

The ISA3 series covers three types of catch sensors: A new addition to the existing type G, with a query distance of 0,02 to 0,15 mm, and type H, with a query distance of 0,05 to 0,3 mm. SMC now offers type F with a nominal range of 0,01 to 0,03 mm. This expansion creates the opportunity to introduce the ISA3 gap checker sensors in processes with very short measuring distances, or those where higher precision is required.

An added feature to the new ISA3 sensor is the connection cable, allowing several sensors to be linked to a centralised lead wire. In addition, the air connection can be on either the right or left side of the control unit. Both serve to reduce the wiring work and features more flexibility in the design.

Less weight, hardly any noise

In their development work, SMC engineers continue to pursue the goal of increasing cost-effectiveness combined with lower energy use. This can also be seen on the ISA3 series gap checker sensors, where air consumption was reduced by about 60% compared to the previous ISA2 series. “This doesn’t just save operating costs, it also helps the environment,” concludes Abbott.

For more information contact SMC Pneumatics South Africa, +27 (0)11 100 5866, sales@smcpneumatics.co.za, www.smcpneumatics.co.za
Emerson has announced an extension of its Plantweb digital ecosystem with the new Plantweb Insight Heat Exchanger app, an affordable, easy-to-use analytics and asset alert predictive intelligence tool, which provides maintenance staffs real-time access to critical heat exchanger diagnostics anytime, anywhere to improve operations in chemical, oil and gas and refining operations.

Providing quick return on investment through reduced slowdowns and shutdowns, Emerson’s Plantweb Insight apps leverage Emerson’s Pervasive Sensing Strategies to help users instantly make sense of plant data and drive overall enterprise profitability. Emerson’s Plantweb Insight Heat Exchanger app joins the previously announced apps for pumps, steam traps and pressure gauges.

“The web interface with Plantweb Insight is very intuitive. It is easy to get useful information about our steam traps without requiring a lot of user training. This makes it easy for operators and engineers to benefit from the system,” said Michael Sowell, regional manager of energy distribution, Evonik.

The Plantweb Insight apps employ pre-built algorithms based on decades of process experience and industry-vetted analytics to deliver predictive diagnostics, enabling maintenance prioritisation. The easy to use interface allows maintenance and operations to take instant action within a browser from any laptop, tablet, smartphone or other device connected to the network.

Plantweb Insight monitors shell and tube heat exchangers to provide real-time status and alerts including fouling, heat duty and heat transfer coefficient. It does not require integration with the plant’s existing monitoring and control system. It can operate completely independent of existing or legacy control systems. The app can also leverage existing data points if desired, using OPC UA to collect data stored in the control system, historian or data base if access is available.

Plantweb Insight apps paired with wireless instrumentation lower the cost to entry for customers looking to implement an Industrial IoT strategy. Emerson’s Plantweb digital ecosystem is a next-generation Industrial IoT portfolio that extends the power of automation beyond process control to the entire enterprise.

For more information contact Rob Smith, Emerson Automation Solutions, +27 (0) 11 451 3700, rob.smith@emerson.com, www.emerson.com

Humidity generator for RH probe calibration

Fluke Calibration has on offer the 5128A RHapid-Cal Humidity Generator, a portable, versatile humidity generator for calibrating a large variety of probes and loggers in the field or laboratory. The 5128A is ideal for corporate and independent calibration laboratories where humidity measurement is critical to prevent spoilage of products, including pharmaceuticals, medical devices, semiconductors, chemicals, and food production.

The instrument is lightweight and compact so technicians can easily take it to the field for thorough, reliable multi-point calibration of humidity probes and loggers. In the laboratory, it reduces calibration time by at least 33 percent compared to traditional two-pressure humidity generators, which are slower to respond to humidity and temperature set point changes.

The 5128A delivers:

• Best-in-class system accuracy of 1,0% RH for dependable humidity probe calibration.
• Rapid humidity and temperature stabilisation time for high calibration throughput.
• Rate of change for temperature increase is typically 10ºC/minute; for temperature decrease 1,5ºC/minute.
• Rate of change for humidity increase is typically 10% RH/minute; for decrease 5% RH/minute.
• A six-point calibration can be done in two hours.

Easy maintenance

The 5128A RHapid-Cal comes standard with an ISO 17025 accredited system calibration and is backed by Fluke Calibration’s world-class metrology and support. A front-loading desiccant cartridge can be easily changed by removing the front cap and sliding in a new one. Only clean distilled water is required to operate the 5128A.

For more information contact Comtest, +27 (0)10 595 1821, sales@comtest.co.za, www.comtest.co.za
Plug-and-play solution for condition monitoring

A multi-channel, complete plug-and-play solution for condition monitoring of equipment is available from FAG. The SmartQB is a ready-to-use, preconfigured condition monitoring system for electric motors, fans, compressors and gearboxes. The system is ideal for industries such as cement, paper, steel, water management, machinery, and plant engineering. Commissioning takes a mere five minutes and requires no special skills or understanding of vibration diagnosis. Clearly understood plain text messages relating to the causes of any possible defects are generated on the touch screen display when changes occur in the condition of the equipment, with the option of over 15 languages.

The system allows for 24/7 monitoring for maximum plant availability and is preconfigured for the capture of various anomalies, with up to six sensors. Output of five error states is possible, namely bearing damage, unbalance, friction/cavitation, temperature increases and basic variations.

Additional features include a live display of current values, trend pattern and damage development, an RJ45 Ethernet interface for service technicians, and static information regarding operating hours, defect frequency (yesterday/today/overall), maximum values, and mean values since the last evaluation.

FAG is a flagship brand for Bearings International (BI), which focuses on top quality products from leading international manufacturers involved in the industrial aftermarket, OEM, manufacturing and mining sectors. “BI’s premium products offer our customers the best cost-to-performance ratio. Our customers can also count on leading technical service and support,” says product manager Coenie van Deventer. “We recognise the constraints of high energy prices, low productivity, skills shortages and a highly competitive economic environment. The BI and Schaeffler engineering and reliability divisions offer a highly flexible range of predictive, planned and breakdown maintenance services,” van Deventer adds. Engineering services include application design, evaluation and optimisation.

Replace the sleeve on a pinch valve in 80 minutes

The standard practice for replacing a sleeve in any pinch valve is to remove the valve from the line, which requires the use of a crane for all but the smallest valves. The valve is then stripped – the sleeve replaced – and the valve rebuilt. It is then reinstalled in the line, a process that can take several hours at best requiring the attention of several fitters and millwrights.

With the patented Red Roc Hi-Lift feature, the valve remains in the line and the sleeve can be replaced in a much shorter time with only two fitters.

On 15 September 2017 at a nickel mine in Mpumalanga a Red Roc valve sleeve was changed in 80 minutes and reduced the plant downtime by at least ten hours.

“The process is simple and only involves removing the bolts holding the top half of the body in the line and slackening the ones in the bottom half. Jacking bolts on the valve flanges spread them from the pipe flanges, loosening the sleeve, so that it can be removed in line. The quick release clamps holding the two halves together are removed. The top half is then raised using the two hydraulic cylinders mounted on the bridge and operated by a hand pump. In the raised position the old sleeve can be lifted out and the new one fitted in position. The process is then reversed with the body being allowed to drop by releasing the oil in the cylinders back to the reservoir – the clamps are refitted and line bolting replaced,” said Gregor Hopton, Afrivalve’s group marketing manager.

The Red Roc Hi-Lift pinch valves are manufactured by Afrivalve, a division of eDART Slurry Valves at its facilities in Jet Park. The range includes sizes from DN150-DN600 with larger sizes available on request.

For more information contact Bearings International, +27 (0)11 899 0000, info@bearings.co.za, www.bearings.co.za

For more information contact Gregor Hopton, Afrivalve, +27 (0)11 791 1411, gregh@afrivalve.co.za, www.afrivalve.co.za
**Precise control with segment disc valves**

Segment disc valves work on a very simple but effective principle. The central throttling elements – the segment discs that glide and seal against each other – are positioned in the valve body perpendicular to the flow direction. On a non-rotatable aligned segment disc whose geometry determines the flow rate and characteristic, a movable disc having the same number of segments is shifted by a tangentially engaging rod in such a way that the free cross-sectional area of the segments changes continuously.

Regardless of the prevailing pressure difference, a spring assembly constantly presses the movable disc onto the fixed disc. As a result, the flow direction is variable and the valve can be installed in any position.

This special design makes segment disk valves one of the few valves that combine control precision even in extreme operating conditions with a high seal tightness and very low exposure to wear.

**Segment disc valves and segment disc orifices**

Perfect and variable control with high precision over a wide flow range is made possible by the segment disc valves from Schubert & Salzer. Due to the robust design and the reciprocal flow direction, segment disc valves are suitable for fluids as well as vapours, even if these are contaminated by particles. The wide range of applications includes areas such as building materials, chemical and power plants, pipelines, water supply and disposal, as well as shipbuilding. This ingeniously

For more information contact Kamil Maharaj, Macsteel Fluid Control, +27 (0)31 581 7800, kamil.maharaj@macfluid.co.za, www.macsteel.co.za

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**RS Pro range of USB keys delivers secure data storage**

RS Components has introduced a new addition to its high-quality RS Pro range with the launch of the Evikey One NFC cybersecure contactless USB key. The innovative range of USB flash-drives delivers a high level of security for important data by enabling users to lock and unlock the drive using their smartphone, essentially as an electronic key.

The range incorporates a standalone cyber-security device called the ‘Contactless Padlock Self Sufficient’, which generates electrical power to operate the ‘Fullsecure’ system. This energy is gained from the signal produced by the NFC antenna from NFC readers, in particular NFC powered smartphones, tablets or other smart consumer devices, in conjunction with an app running on the smartphone. Because it is autonomous in electrical energy, the key can be administered and unlocked without it being connected to an external power source, such as via its USB interface. In addition, the devices are simple to use, as they require no installation of software or drivers on host computers.

In addition to being waterproof, other features of the flash drive include: TLC (triple-level-cell) flash memory; four embedded electronic security levels; and compatibility with Android 2.3.3 and higher, and with USB 1.0, 2.0, 3.0 OTG. Eight models are available with a range of memory capacities, including 8, 16, 32, 64 and 128 GB.

For more information contact RS Components SA, +27 (0)11 691 9300, sales.za@rs-components.com, www.za.rs-online.com

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**Powerful switched-mode power supply with reserve**

These new power supplies from ifm provide an excellent power reserve of 50 percent for up to four seconds to cope with short current loads. Instead of an inrush current limitation with a simple NTC element, charging the capacitors of the new ifm switched-mode power supplies is microprocessor controlled. This ensures an ideal start-up of the voltage supply.

The voltage supply is ensured for several milliseconds if the mains voltage briefly fails, e.g. caused by switching operations in the supply network.

ifm switched-mode power supplies provide the specific nominal power across the entire temperature range and derating only has to be taken into account above an operating temperature of 60°C.

All 24 V switched-mode power supplies are equipped with double terminals, which simplifies wiring and provides more clarity in the control cabinet. Innovative technology means the new ifm power supplies require considerably less space in the panel, as compared to common cabinet power supplies.

For more information contact ifm electronic SA, 086 143 6772, info.za@ifm.com, www.ifm.com
**Magnet’s Schneider portable Mobiya solar LED lanterns**

Magnet now distributes new portable Mobiya solar LED lanterns, which have been designed by Schneider Electric as a convenient, safe and reliable source of energy efficient lighting.

Mobiya TS 170S off-grid portable solar LED lanterns consist of a solar panel and an integrated mobile phone charging facility, with a USB cable with 5 adaptors.

This compact, user-friendly lighting system is particularly well suited for use in off-grid households, small shops and for street vendors. Mobiya solar lanterns are also effective in power outages, emergency situations and vehicle or machine breakdowns. Apart from the convenience of having uniform lighting available exactly where and when it is needed, these lamps are equipped with a handy mobile phone charger, with USB ports, enabling users to charge mobile phones any time, at no cost.

These environmentally friendly lanterns do not generate noise or emissions, can be hand carried and are drop impact resistant from a height of 1.5 m and water resistant up to 0.5 m for 1 hour. They have three level settings which provide 48 hours of light at 20 Lumens output, 12 hours of light at 85 Lumens and six hours at the maximum 170 Lumens.

An advanced Lithium Ferro Phosphate (LiFePO4) battery, with a 1500 cycle, three-year life span, is charged efficiently through the solar panel, with micro-controller based charge control to prevent over charge and deep discharge. Smart electronics for battery monitoring shows indications for battery charging, the battery charge level remaining and the need for re-charging when drained. For added convenience, a phosphorescent switch enables the user to locate the lamp in darkness.

**Schneider Electric’s Easy Pact CVS range of circuit breakers**

Schneider Electric offers the EasyPact CVS range of Class II, moulded case circuit breakers, which are precision engineered to help make installations safer and more reliable, while offering essential capabilities with exceptional quality and value.

Manufactured from premium materials in ISO 9001 and ISO 14000 certified production plants, the range of circuit breakers are fully tested and certified by national, international and third-party organisations to all relevant safety standards.

EasyPact CVS is the easy choice for most common electrical distribution applications in medium sized commercial and industrial buildings. They provide an exceptional feature set at their price point, including extended current limiting capacity and adjustable thermal protection.

As a cost-effective investment, customers pay for only what they need and do not have to settle for lower grade alternatives. With simplicity of selection, purchasing, stocking and installation designed into every breaker, the range delivers unbeatable value throughout their life cycle.

**Boost uptime and cut costs**

This range is both fast to install and easy to use, as well as offering the utmost in operational safety. Engineered to match common electrical distribution applications, the range delivers exciting design and a focus on scrupulous manufacturing quality to ensure it remains cost-effective over the long run.

Adjustable thresholds and a service breaking capacity rated at 100% of the ultimate breaking capacity enhance the reliability and life cycle of the products while reducing servicing costs. Its compact, modular design and field-installable accessories shared with other ranges help to simplify ordering, stocking and installation.

The robust circuit breakers are suitable for isolation, guaranteed to the IEC 60947-2 standard, and provide a highly visible and lockable contact position indicator to ensure operator confidence. Extended current limiting and thermal protection can greatly reduce the stresses on equipment due to short circuits and their associated effects. Earth leakage protection can be added by installing a Vigi CVS option module. In the event of a circuit fault, simple visual indicators help maintenance personnel quickly locate the tripped breaker and take steps to correct the problem.

**For more information contact**

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