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THE FUTURE OF FIRE SUPRESSION TECHNOLOGY IS HERE.
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In almost all fields of process and plant engineering, liquids or gases are found and electronic flow sensors are deployed to prevent damage or downtime caused by disruptions in the flow. ifm’s SM type flow sensors are excellent for monitoring varied types of such media across applications. See this month’s cover story for more.
Have you ever wished someone would automate the daily grind of routine tasks and set you free to focus on the more engaging aspects of your job? Imagine a robot sitting in front of your computer capable of invoking the same applications and executing the same keystrokes that you would usually make.

Enter robotic process automation (RPA), a disruptive workplace technology that uses software “robots” to mimic many of the repetitive interactions human beings have with their computers. It performs such tasks faster than us people, and also eliminates the errors we are prone to make. These bots act directly across an application’s user interface, logging themselves in and out, entering data, and even computing the end results.

However, as is true of most automation, RPA only translates into competitive advantage when it is applied in the right context. Applied inappropriately, the bots are quite likely to run amok, and leave more work for the human operators to clean up than if they had just done the job themselves in the first place.

So what are the criteria for a successful RPA implementation in a manufacturing context? Well, first of all, the chosen tasks must be repetitive in nature; and second, RPA is best applied where the repetitive process is also highly susceptible to human error. Examples of where these conditions are likely to exist in a manufacturing company include order processing, bills of materials, inventory reports, regulatory compliance, and customer communication. RPA can deal with involved processes such as matching large volumes of transactions, certifying account reconciliations, or even collecting and compiling data for complex financial reports.

Robots are arguably better than humans at performing such tasks since they do not need to take breaks and are not prone to boredom when tasks are prolonged and mundane.

The close of the third industrial revolution was marked by the introduction of mass industrial automation and robotics. The microprocessor revolutionised manufacturing and companies that embraced and adopted this technology were the beneficiaries of sustainable manufacturing advantages. Similarly, in this industrial era, businesses and countries that embrace and adopt 4IR technologies (including RPA) look set to be the ones that benefit from global agility and cost efficiency.

RPA is forecast to play an increasingly important role as organisations progress with their digital transformation plans. It offers companies an exciting new way to improve their operations while also improving employee job satisfaction. RPA solutions look likely to become a widely adopted strategy for enhancing value chains by freeing employees to focus their time and efforts on more high-value and meaningful work. The benefits accrue from being able to do more with less while reducing errors, increasing worker job satisfaction, and better ensuring that deadlines are met, which benefits accrue with only relatively small capital requirements and IT resources. While RPA cannot be applied to all types of work, it can save time spent on routine, manual tasks when correctly applied.

Interested readers will find more information about RPA in the online article hosted at https://www.instrumentation.co.za/10438r.
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SEW-Eurodrive supplies gear units for agitators and mixing systems

Gear units in an agitator design are often equipped with an extended bearing housing optimised specifically for use in mixers and agitators, using tried-and-tested standard gear unit series. SEW-Eurodrive is able to supply these gear units to cover blender, agitator, aerator, mixer or kneader applications in a range of industries.

The benefits in an agitator design include an optimised housing for particularly high permitted overhung loads. What is more, no additional bearing is required to absorb the axial and radial forces generated by the agitator shafts. The shaft and flange dimensions are compatible with standard dimensions.

Different options and design variants are available to accommodate a range of applications, including a special explosion-proof design for hazardous areas. Full customer support and technical backup is also available from SEW-Eurodrive to assist customers with their specific design requirements.

For helical gear units, the RM series has been a long-standing variant for mixer and agitator applications. New to the portfolio are the parallel-shaft FM/FAM helical gear units, and the bevel-helical KM/KAM gear units.

In many cases, parallel-shaft and helical-bevel gear units are also used for this type of application. These gear variants enable more efficient utilisation of existing spatial circumstances, while the agitator shafts with mixing element can be inserted directly into the hollow drive shafts. Additional bearings can be dispensed with in many cases, thereby reducing costs and maintenance requirements even further.

Features of the specific agitator design include a double oil seal on the output side for additional protection against leaks, and reinforced bearings opposite the output side to increase the permitted overhung load.

Particularly for high output speeds and low gear ratios, there is a grease nipple for further greasing of output shaft bearings, while a drywell design with leak sensor prevents contamination by leaking lubricant.

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

Africa Automation Technology Fair 2021

It’s one year until the doors open to Africa’s leading industrial automation technology event. Set to take place at the Ticketpro Dome from 18-20 May 2021, the event will be attended by South African, African and international visitors and exhibitors.

With the Covid-19 pandemic about to peak in South Africa, we are seeing the effects of the lockdown in every sector of the economy. Trade shows like the Africa Automation Technology Fair will be a key driver for reigniting business activity in the future. The face-to-face experience that the event offers will not only engage the five senses for buyers and suppliers, but will also play a pivotal role in putting Africa’s industrial automation technology sector at the forefront of business processes and decisions.

Attendees can look forward to engaging in new experiences, starting with the launch of a virtual hub, which allows industry players to connect, learn and share while the world is in lockdown. Online workshops and webinars will spark debate and feature insights shared by leading economists, prominent industry experts and futurists, paving the way for growth and innovation for this sector.

Positioned as the heartbeat of the industry in Africa, Africa Automation Technology Fair will host new and exciting features catering to exhibitor and visitor needs. All attendees can look forward to:

• An African-hosted buyers’ programme.
• One-on-one meetings with hosted buyers.
• African-hosted buyers’ lounge.
• VIP programme and lounge.
• A technology demo zone.
• A business connection zone.
• Guided visitor tours.
• CPD accredited workshops.

Africa Automation Technology Fair partners critical to success

The event organisers (Reed Exhibitions – Africa) continue to work closely with the official association partner: the Society for Automation, Instrumentation, Measurement and Control (SAIMC), and the official media partner, Technews Publishing, to ensure the event delivers quality content and a world-class showcase. The Wireless Access Provider’s Association also confirmed its participation as a supporting association.

Those interested in attending the upcoming webinars, or looking for more information to participate in the event, can contact the organisers on info@africaautomationfair.com.

For more information contact Leatitia van Straten, Reed Exhibitions – Africa, +27 71 884 8366, leatitia.vanstraten@reedexpoafrica.co.za, www.africaautomationtechnologyfair.com
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NEWS & EVENTS

Comtest trading for 15 years

Comtest, one of South Africa’s leading providers of test, measurement and communications equipment, is proud to mark its 15-year trading milestone in 2020.

CEO Barend Niemand says, “Comtest has representation throughout South Africa and with our bold, worldwide export sales-drive, our vision includes adding new products to the existing range, and the acquisition of new companies to complement our core business.”

The company was founded by Peter Verwer and Barend Niemand in 2005 and has its HQ in Linbro Park, Gauteng. Aside from being Fluke’s Master Distributor to South Africa, it also represents leading international companies in the test and measurement fields: Beha-Amprobe, BK Precision, Fluke Calibration, IET Labs, Industrial Scientific, Keytag, Meriam, Microsemi, Midtronics, Pico Technologies, Radian Research and Tektronix.

Instrotech was acquired in 2010, to expand the business into the process and automation industries through its high-quality process control instrumentation and industrial electronics. Partnering with international leading brands Vishay, Optris, Keller, Siko, Kobold, Monitran, Elsi, Scancon, and Sensortech, Instrotech supplies cost-effective, consistently reliable, high-quality industrial electronics, sensors, instrumentation and calibrators for the automated process and control industry, complementing primary sensors such as load cells, pressure and flow transmitters, sourced from European and North American companies.

“Business is not for the fainthearted in these recent, highly challenging trading-times, but Comtest has strong, knowledgeable and a loyal team driving our goals and aspirations, so I feel confident that we will inevitably reap the benefits as soon as the economic climate eases,” concluded Niemand.

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

SMC steps up to support essential service customers through lockdown

SMC Corporation South Africa, as a leading supplier of advanced pneumatic and electrical automation technology, has remained open and certified as an essential services supplier throughout lockdown. We are ready to assist all our current and potential customers requiring technical support or supply of essential repair and maintenance products.

As a customer focused organisation, SMC is committed to ensuring that all its essential service customers are able to operate at maximum capacity through the critical lockdown period and in the economic recovery thereafter. The company is available through all normal communication channels to assist with technical queries and specifications, product lead time queries, and to take new orders. To maintain our own compliance with lockdown regulations, local dispatching will be limited to certified customers operating as per regulation. Any essential service items ordered from local stock, production or assembly can also be provided. Non-stocked items may also be imported for you although lead times may be affected by the current backlogs and delays in international freight services.

SMC Corporation is also taking all recommended precautions to minimise exposure risk to our own employees and yours, as the customer. We perform regular screening of employees, and apply social distancing principles and sanitising activities.

With our extensive warehouse of stocked automation components, our knowledgeable team is ready to advise and support companies around the country and into Africa. For those customers requiring made-to-order supplies, the local manufacturing and assembly facility is operational. Our sales counter is also open for order intake, although we request that all visitors apply precautions as per our guidelines. Same-day dispatch of items in stock is available until 15:00 on weekdays.

We understand that some component suppliers are seeing challenges in their supply chain. SMC can offer you an alternative should you wish to limit the impact by any of these issues.

For more information contact
SMC Corporation South Africa,
+27 10 900 1233, zasales@smcza.co.za,
www.smcza.co.za

Appointments

Extech Safety Systems has appointed Neal Harrison as external sales and applications engineer.

Hytec South Africa has appointed Werner Voigt as project manager.

Jbee Steyn.
Endress+Hauser performed well across all fields of activity, industries and regions in 2019. The Group created hundreds of new jobs, invested record amounts and improved in the area of sustainability. According to CEO Matthias Altendorf, the family company is thus in a strong position to address the challenges of the corona crisis. “2019 was a solid year for Endress+Hauser,” he emphasised. “Growth was broad-based and balanced.”

The measurement and automation technology specialist for process and laboratory applications increased net sales by 8% to 2,652 billion euros, despite a weakening economy. During the annual media conference on financial statements in Basel, the CEO explained that instead of large-scale orders, this growth was driven by smaller and medium-sized projects.

USA still the largest market; China overtakes Germany

In 2019, Asia provided strong growth impulses. Europe performed well and South America recorded excellent growth. North America fell behind expectations, however, while the business in Africa and the Middle East declined. China overtook Germany based on sales volume and in Africa and the Middle East declined. China remained the largest market, overtaking Germany.

Digital intimacy bridges the physical distance

Endress+Hauser started 2020 with a further increase in incoming orders. However, the coronavirus pandemic makes it massively more difficult to achieve the original goals. “Although we are still unable to predict the economic impacts of the crisis, we and our customers will certainly feel the effects,” underlined Altendorf. The Group responded early to the spread of the virus and used all means at its disposal to protect people’s health and continue to offer customers solid support.

“We bridge the physical distance through digital and emotional proximity,” emphasised Altendorf. The CEO has been driving digitisation at Endress+Hauser for years – in the product and services areas, as well as in customer interaction and internal collaboration. At peak periods, up to 10 000 employees are currently working from home. Customers can use the website to order instruments or track orders and an online tool enables remote support aided by video.

Group aims to safeguard employment

“Our everyday heroes are those working in production, logistics and service, or under difficult conditions from home or in the office,” added Altendorf. “Through hard work, the company has been successful in ensuring the availability of materials, keeping the logistics chains intact and supporting customers in all respects. The Group’s plants are operating and Endress+Hauser is still able to deliver.”

The CEO therefore believes that the company is well prepared for difficult times. “We have always run a sound business and as a company we are very well positioned,” concluded Altendorf. “We will do everything we can to safeguard jobs and bring Endress+Hauser through this crisis. This will benefit customers, employees and shareholders.”

The shareholder family supports this course and accepts a decline in profits, said supervisory board president Dr Klaus Endress. “We would like to have as many people as possible on board when the wind shifts and things pick up again.”

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

Endress+Hauser sees itself as well positioned

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THE PART 1 COURSE IS NOW AVAILABLE ONLINE VIA SELF STUDY AND ZOOM SESSIONS

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

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

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

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

His work has proved invaluable to plants and has resulted in greatly improved performance and ROI.

MICHAEL BROWN CONTROL ENGINEERING CC
From the office of the CEO

President Cyril Ramaphosa rightly stated in his letter of 11 May: “Imposing a nationwide lockdown gave our country a strategic advantage. It bought us valuable time to prepare our health system and put in place containment measures. This has slowed transmission and saved lives.

“As the restrictions on economic activity and daily life are eased, it is vital that all South Africans maintain that firm sense of personal responsibility. In all that we do, in every sphere of life, we must take care of our own health and the health of others.”

Also bear in mind the following statement from www.sacoronavirus.co.za under the heading ‘Don’t panic.’ “There is no need to panic – 82% of Covid-19 cases are mild: patients only experience a slight fever, fatigue and a cough. Only about 6% of patients need intensive care. The vast majority of people can stay at home and get better without hospital treatment.”

As the active cases slowly increase (active = positive/recovered/died), South Africans seemed to forget all about the ‘Don’t panic’ initiative. Police, army, healthcare, and politicians seemed to jump on the panic wave and the result created visions of another failed, militant African state in the making, including our newly achieved junk status.

When any business makes rules that the employees do not understand, there is confusion and suspicion. This is true in business, in the home as well as in politics.

Suspicions about people gaining from banning the sale of certain items, government driving its political agenda, and assistance for only companies of a certain population group abound – and all because an open book policy was not followed.

The SAIMC stands firm behind the president of South Africa, but at the same time, we question why the government found it necessary to be so secretive about why certain decisions were made, other decisions were made one day and thrown out the next, etc. It creates bad impressions about the motives of people in power and the competence of those behind the decisions.

One thing that President Ramaphosa did get right though was to unite the country behind him at the start of Level 5 lockdown. Then, everything seemed to go haywire when we moved to Level 4. It seems that it is time for Mr. Ramaphosa to take back the reins of power and start leading the country again, with the authority and understanding he has shown in the past.

Yours in automation,
Johan Maartens.
Vaal branch

On 5 March the first coronavirus case was recorded in South Africa. The government reacted swiftly and called for a nationwide lockdown which commenced on 27 March 2020. Since then there have been extensions to the lockdown, certain relaxations and many amendments to the rules.

From the SAIMC, we are busy planning ways to allow our branch technical evenings to take place via the Web, but at this stage are struggling to find a suitable portal that can accommodate all our needs. In the meantime, please feel free to take part in the various webinars and quizzes on our website: www.saimc.co.za.

Also see some great initiatives from our latest branch patron member (ifm electronic) on what they are doing to improve safety in the work environment.

Hygienic door handle reduces the risk of infection
During the coronavirus crisis, everyone is called upon to take action in order to slow the spread of Covid-19. Ifm has put its expertise in tool design, tool construction and plastic injection moulding to use to produce hygienic door handles. Only three weeks passed from the initial idea and prototype to the start of production.

Door handles are known to be a breeding ground for germs. Opening doors without touching the handle with your hands can therefore help reduce the spread of infections. This door handle allows you to open and close doors with your forearm. The hygienic door handle consists of two plastic pieces which can be mounted on round door handles using four screws without needing to drill any holes.

Johannesburg branch

Here we are at the end of May, still in lockdown Level 4. While we at the Johannesburg branch are doing our best to bring technology to our loyal members, there is still nothing like the human touch.

One thing we can be sure of is that Covid-19 has changed the world as we know it, maybe forever. Technology that was only supposed to be with us in 10 years has now been fast tracked to be ready in 5 years. Where does that leave the process control and automation industry? Not to be left behind, the industry will have to find innovative ways to assist its customers with the latest technology.

With most industries facing job losses, automation will most definitely play a much bigger role going forward and we must assist our customers to embrace new technology.

April technology evening
Due to the lockdown, the Johannesburg branch decided to host a digital technology evening so as not to let our members down. Dean Floyd from Pepperl+Fuchs stepped up and provided us with a YouTube presentation on AS-Interface.

So, what is AS-Interface? It is a distributed network for standard and safety I/O. It is an open solution supported by 300 vendors. A simple network can reduce wiring by up to 90%, and installation is fast.

Hardwired sensors are extremely labour- and cost-intensive, so the sensor world came up with the idea of distributed networks. Networked sensors have reduced labour and cost due to direct connection to I/O modules on most PLCs, with shorter and lower-cost cables being used.

It is also important to note that AS-Interface is backward compatible, meaning a gateway or scanner sold today will work with any AS-Interface device ever built, and it supports functional safety as well.

Annual gala dinner 2020

It is with deep sadness that we have made the very difficult decision not to hold the SAIMC annual gala dinner this year.

This is an event about which we are all very passionate and it wasn’t a decision we made lightly but it’s definitely the right one given the current circumstances of the COVID-19 pandemic and the uncertainty around large gatherings and the associated economics.

We look forward to planning something special in 2021!
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Contact: jane@technews.co.za
Exceeding the limits

The new SM flow from ifm electronic.

In industrial processes where liquids, air or gases are used, process sensors serve to measure and detect pressure, temperature, flow and levels.

Pressure sensors are used to detect the system pressure of oil in hydraulic systems or to measure the hydrostatic pressure in tanks and vessels in the food and beverage industry.

Flow sensors monitor the coolant and lubricant supply of machines, power units and industrial furnaces or ensure ventilation of installations and buildings. Electronic level sensors monitor filling levels of liquids or bulk materials in containers, tanks and silos.

In the food, beverage and pharmaceutical industries, temperature sensors are used to ensure that products are at the correct temperature. In machine tool and automotive applications, the temperature or temperature difference measured at drives, gears and motors plays an important role as an indicator of the machine condition. In the metal and glass industries, temperature monitoring of cooling circuits serves to prevent overheating of plants.

Valves are used for dosing and control of liquids, air or gases. Dual inductive sensors provide reliable position feedback for pneumatic valve actuators and valves. Valve sensors provide position feedback on linear valves.

Flow sensors and flowmeters

In almost all fields of process and plant engineering, liquids or gases are used, e.g. for coolant and lubricant supply of plants and power units or ventilation of installations and buildings. Electronic flow sensors are used to prevent damage or downtime caused by flow interruptions. Ifm’s product range comprises flow sensors with different measuring principles for monitoring the most varied types of media, including water, oils and coolants, but also air, compressed air or aggressive media. Their application areas range from simple monitoring tasks to precise flow rate measurements.

Precise monitoring of processes

Thanks to its optimised measuring pipe, the new magnetic-inductive flowmeter of the SM series now covers measuring ranges of up to 150 l/min. Besides the flow, the temperature and the total quantity are measured.

Despite the compact dimensions, the high temperature resistance of up 90°C allows operation in difficult applications such as ovens, where the cooling water reaches very high temperatures. The TFT display shows several process values simultaneously, and the two separate switch point LEDs and the optional colour change provide an ideal overview. In combination with the
intuitive operation via three buttons, the self-explanatory menu items considerably reduce the setup time of the sensor.

**Advantages and customer benefits**

Process reliability and energy monitoring: the overheating of tools, welding guns or ovens leads to increased wear and eventually to production downtime. Continuous monitoring of the water cooling ensures the process reliability of applications requiring intensive cooling. For this, the SM type flowmeter features high accuracy and integrated temperature measurement. In combination with the total quantity meter (totaliser function) it is also possible to implement reliable energy monitoring.

Pump output can be reduced thanks to the minimisation of pressure loss: the optimised design of the measuring pipe with an increased internal diameter reduces pressure drops. Advantage: pump outputs can be reduced. This saves energy costs.

Reduction of setup and hardware costs thanks to IO-Link: several measuring parameters (flow, temperature, total quantity) can be evaluated in the controller via only one input. Measuring points, wiring and PLC input cards are reduced, which saves costs. The integrated simulation function simplifies the setup. The sensors can be integrated into the controller and be checked without the plant being in operation.

Slim design optimised for standard splitter boxes: to separately monitor individual cooling lines, several flowmeters are used simultaneously. Their slim design featuring an ideal installation position and a connector position optimised for practical use renders complex piping and the displacement of sensors unnecessary. This allows use in standard water distributors with an internal diameter of 50 mm. Another characteristic: no inlet and outlet pipe lengths upstream and downstream of the sensor are required. This enables maximum flexibility for the layout and installation of the plant.

**Application examples**

Injection moulding machine: the cooling water quantity and the temperature are key factors when it comes to the quality of the final product. Clogging must be detected without delay. This is ensured by the SM flow sensor.

Hardening system: the cooling curves of workpieces must be adhered to during hardening processes. This is done by applying a defined quantity of cooling water to the previously heated workpiece. The SM detects potential clogging, ensuring a continuously high product quality.

Machine tools: permanent cooling water supply ensures consistent quality and extends the lifetime of the tool. Swarf can clog cooling water pipes. The SM detects this in time and prevents overheating of the tools.

Oven construction: lack of cooling water can lead to dangerous excessive temperatures in the oven. The SM monitors the cooling water quantity and temperature up to 90°C. Expensive downtime due to excess temperature is a thing of the past.

**SM flowmeters solve a tricky control problem in a chilled water system**

Swiss-based HeiVi is a specialist in the planning and project management of heating and air conditioning systems. As co-founder Peter Heimann explains: “Our target is to obtain maximum energy and economic efficiency with comfort and ease for our customers. To achieve this, we often have to think outside the box.”

This was recently the case when efficiency difficulties were experienced with the water chilling system at a branch of the Schweizerische Nationalbank in Basel. The problem was identified as a shortcoming in the control of the chiller’s compressor and associated storage water reservoir charging pump.

**Out-of-the-box-thinking results in substantial energy savings**

To optimise the process, a method of controlling the storage charging pump and the compressor in line with the demand for chilled water from the storage reservoir was needed.

Using ifm’s volumetric flowmeters of type SM6500, HeiVi devised a method to balance the storage tank’s charging and discharging mass flows according to a formula that would ensure optimal efficiency under all conditions. With the ‘zero volumetric flow’ control achieved by means of the ifm flowmeters, performance control of the compressor could be fully utilised, which resulted in substantially reduced overall energy consumption. Consequently, the chiller could be made smaller, which brought about an additional saving on the initial investment. The bonus is the ongoing cost saving that accrues through the reduced energy demands of the system’s storage water charging pump.

A well satisfied Heimann concludes: “We have subsequently equipped several branches of the Basel Kantonalbank with the new process, as well as the Cler Bank in St. Gallen and the laboratory of the Baugewerbliche Berufsschule in Zurich. All thanks to ifm’s flow sensors of the SM range.”

For more information contact ifm South Africa, +27 12 450 0400, info.za@ifm.com, www.ifm.com
The complexity of water management in mines

Water is a critical resource for the mining industry, either in the mining processes, as a feed to the beneficiation of minerals process, or for potable use. With the growing demand and increased scarcity of usable water, it is very important for mines to prove that they utilise water optimally, by suitable reuse and reclamation of contaminated water. Water demand management and conservation forms an important part of mining operations, irrespective of whether it uses surface or ground water and whether it impacts downstream water resources. By implementing state-of-the-art water management systems, mining companies will start to realise the importance of the water they use and will therefore recognise the scarce resource as an invaluable asset in their operations.

The key steps in the implementation of water conservation and water demand management (WC/WDM) are based on resource protection and waste management, and entail the following:

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

Water reuse and reclamation

Endress+Hauser has been a valuable partner in the global water and wastewater industry for more than 65 years and in Africa for 35 years. Based on that industry expertise, the following are some examples of where the company’s products, solutions and services can be utilised in the implementation of the DHWS Best Practise Guidelines (BPG) for water management in the mining industry.

BPG H3: Water reuse and reclamation: the reuse and reclamation of contaminated water is important for any mining operation as it indicates that they optimise their water utilisation. All new and existing mines are required to prove this optimisation of water reuse and reclamation by having a Water Reuse and Reclamation plan.

This plan must consider the water and salt balance over the lifetime of the mine. Accurate measurement and storage of water abstraction, use and release data will assist in maintaining a historical record of long-term water balance. The Endress+Hauser Proline Promag family of electromagnetic flow meters can be utilised for accurate measurement of all water sources on the mine, whether potable water, raw water or water contaminated with chemicals. The embedded Heartbeat Technology in the meters ensures that users are at all times aware of the health of their flow meters and the reliability of the data they provide.

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

Water monitoring systems

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

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

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

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

Visit Netilion.endress.com to experience the latest Endress+Hauser innovations or Endress.com for information or assistance on products.

For more information contact Natlee Chetty, Endress+Hauser South Africa, +27 11 262 8000, info@za.endress.com, www.endress.com
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Becker Mining South Africa’s Electronics Division specialises in automation and communication systems, which are designed to enhance productivity and improve safety in the mining sector.

The company has designed a dependable Wi-Fi system, which is recognised by the global mining sector for reliable, safe and efficient high-speed communication underground.

“We have made a substantial investment in researching and testing underground Wi-Fi systems to overcome the problems associated with conventional Wi-Fi networks in arduous underground conditions,” says Andrew Trentelman, senior general manager, Electronics Division, Becker Mining South Africa.

“A critical feature of this advanced system, is its intrinsically safe (IS) design, which enables safe use in harsh and potentially explosive mining conditions. What’s important about Becker’s systems, each of which can be customised to exact requirements, is that each product can be installed as a single stand-alone system, or can be deployed using a phased approach to minimise a massive initial capital outlay.

“The Becker WRAP (Wireless Router Access Point) provides a high-speed backbone for wireless VoIP, seamless roaming of devices, advanced vehicular dispatch systems, process automation, as well as any device which can utilise a wireless, serial or fibre backbone. This system does not limit usage to a single technology, but encompasses migration and integration of many technologies.

“This system incorporates on board tag readers, thus reducing the equipment necessary in a full tagging and tracking solution. The IS WRAP unit’s small form factor, weighing less than 5 kg, ensures ease of installation and maintenance.”

WRAP has a versatile design, which means a combination of communication backbones can be used to optimise the system. For example, fibre can be used for high-data throughput. In working sections of a coal mine, where there is frenetic activity, a wireless mesh topology is recommended by Becker Mining specialists.

As the primary component in creating the Becker Wi-Fi IS backbone the internal layer 3 router contains the logic to route all network traffic to the correct interface card or to the correct fibre point. The route of network traffic is based on the rules configured into the router itself. Firewall rules can also be configured to control bandwidth usage of protocols, as well as to provide security to the network.

WRAP supports various configuration implementations, ranging from traditional distributed antenna backbones, interconnected via a redundant fibre optic loop, to mixed configurations, using redundant WDS (wireless distribution systems) and redundant fibre optic loops.

The unit incorporates an additional fibre optic port for tee-ing off the main backbone used for connecting to a switch. The unit also includes an IS RS485 bus to communicate with any industrial serial device, such as multiple Becker UATRs (UHF active tag readers) for tagging and tracking implementations.

An important feature of Becker’s technology is each system is designed to facilitate future upgrades. These advancements are usually applied in the form of a software update.

Systems from Becker Mining South Africa include Smartsense environmental monitoring and leaky feeder systems, as well as Wi-Fi and underground tracking of personnel and vehicles. Fibre optic and digital radio networks, belt rip detection for overland conveyors and scada and Ethernet networks are also available from Becker Mining South Africa. The company also specialises in advanced transportation and infrastructure technology for the global mining sector.

For more information contact Andrew Trentelman, Becker Mining South Africa, +27 11 617 6300, info@za.becker-mining.com, www.za.becker-mining.com
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Belt conveyor weighing applications

Loadtech’s LT1320 is a precision digital indicator for belt weighing applications. The unit takes the weight and speed information from a belt conveyor system and accurately calculates the rate and total of material transfer. The bright 6-digit 7-segment 20 mm LED displays and the sunlight-readable graphic LCD make for easy setup and readability. A simple menu system allows for easy configuration of display and belt weighing settings. Loadcell calibration can be done directly from the calibration certificate or by using dynamic calibration of the belt conveyor system. The LT1320 also provides an internal jumper selectable power supply for powering an encoder/tacho-generator and a pulse counting digital input to measure the speed of the belt conveyor system. A universal mains switch mode power supply (85-264 VAC) is provided as standard but an optional low voltage (10-30 VDC) isolated power supply can be installed.

The LT1320 contains precision front end circuitry for high accuracy and stability. The ratiometric ADC circuitry automatically compensates for temperature drift and excitation voltage variances due to cable loss. The load cell excitation voltage is 5 VDC and can interface with both 4- and 6-wire loadcells.

RS-232 and RS-485 communications are supplied as standard with the Modbus RTU and Modbus ASCII protocol. A simple ASCII out protocol is also provided for serial printing and communicating to large displays. The LT1320 has circuitry to generate a precision 0/4-20 mA or 0-10 V analog output signal and also includes advanced features such as a totaliser, dynamic tare function, auto-zero tracking, user input linearisation, programmable front push buttons, programmable digital inputs, security menu lockout, dead band adjustment, advanced digital filtering and dynamic calibration, all in one precision belt weighing indicator.

For more information contact Glen Webster, Loadtech Load Cells, +27 12 661 0830, glen@loadtech.co.za, www.loadtech.co.za

C-Gap replaces current methods of CSS measurement

Developed by Mintap, based in Perth, Western Australia, the Closed Side Setting (CSS) measurement device – the C-Gap – is now available through South African-based Control Systems Rustenburg. C-Gap offers accuracy, safety and reliability to the quarrying and mining industries for the measurement of the CSS in gyratory, jaw and cone crushers.

The C-Gap works by placing selected high-density rubber hollow bulbs into the crusher mantle. When the bulb is squeezed between the fixed and moving plates, the air pressure in the hose increases, then, by correlating the air pressure through manual calibration, the CSS is measured between 7 mm and 220 mm with an accuracy of 1 mm.

The process of measuring the CSS on all four sides of a cone crusher takes less than five minutes and requires only one operator. Jaw and gyratory crushers are about the same.

The C-Gap effectively replaces current methods of CSS measurement, namely the use of lead weights, steel drums, aluminium or clay balls, or manual measurement. Because the procedure is so quick and easy, the CSS can be measured every shift on all crushers, ensuring consistent crusher operation by achieving targeted set points across all crews.

Maintaining the CSS
To date, there has not been a quick, accurate and safe way to measure the CSS in larger primary crushers; the CSS on these crushers is usually measured during shutdowns only, meaning it runs unchecked for potentially weeks at a time. This results in reduced crusher performance, placing increased emphasis on downstream circuits.

By measuring every shift, the CSS can be maintained and mantle wear can be documented, assisting with service planning. Operators on sites using the C-Gap commended its safety advantage over the lead weights. Through site comparative trials they noted the C-Gap had an improved accuracy over the use of traditional means. Cost-benefit analyses of sites that currently use lead weights have shown a payback within six months of purchase, when one considers the cost and safe disposal of these. Sites that do not use lead weights enjoy the improved accuracy of the C-Gap.

For more information contact JP van Dyk, Control Systems Rustenburg/Steelpoort, +27 87 230 8391, csssales@controlsystemsrust.co.za, www.controlsystemsrust.co.za
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Join the conversation SMC Corporation (South Africa) SMC Corporation (South Africa)
SEW-Eurodrive has supplied a comprehensive drive package to a major copper mining project in the Democratic Republic of Congo. The package comprised nine drives in total, of which the five main 500 kW type weighed 12 t each. The remaining four consisted of two 90 kW drives on the decline sacrificial conveyor, and two 30 kW drives on the tip-truck sacrificial conveyor.

Working through a local project house with which it has a longstanding relationship, the company received the initial inquiry in August 2018. The final units were delivered to site in September 2019, followed by installation and commissioning.

Due to the hot and humid conditions near Kolwezi, the drives had to be installed with thermal sensors to monitor the input and output bearing temperature, as well as the oil sump temperature. This is to ensure optimal performance at all times. Positioning sensors were also installed, in addition to cooling units due to the size of the drives, and sun covers to protect the surface of the drives from the worst of the harsh sunlight.

The fact that this is an underground copper mine means that decline conveyors are integral to removing the ore. SEW-Eurodrive collaborated with the project house to ensure that all specific requirements for this particular application were met in the final design.

“The fact that this is a new mine means there is significant scope for our further involvement down the line,” comments project sales representative, Thato MR Sookane.

“Collaborating with project houses is a significant strategy for us to secure long-term work in Africa, ably assisted by our own project and exports department. The project house assists the client by providing a specific solution, and then approaches us to assist in turning its designs into a practical reality.”

SEW-Eurodrive has gained significant experience in the copper mining industry, having also supplied a 110 kW VSD for a slurry application at a Zambian mine last year. This represented one of the largest VSDs supplied by the company to date.

Commenting on the current state of the mining industry, Sookane stresses that there are definite green shoots in Africa. While mining is an important driver for the company in terms of growth and profitability, it has also diversified significantly into other sectors such as food and beverage, pulp and paper, sugar and automotive manufacturing.

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

When was the last time you did a health check on your work environment? Monitoring the quality and temperature of the air, air-conditioning, heating, ventilation, outside weather, and even the amount of people utilising the space and what they are wearing, are all environmental and personal factors that contribute to thermal comfort levels. Thermal comfort conditions affect the productivity of the workforce, but it is not just temperature alone that can cause thermal discomfort: movement of air, humidity, HVAC systems, occupation levels and outdoor elements are all factors of the thermal balance inside a building.

Delta OHM, a member of the GHM Group, has launched its new generation Thermal Microclimate HD 32.3 TC data logger, a portable measurement instrument for microclimate and indoor air quality analysis specifically for thermal comfort assessment. Delta OHM was first to introduce a portable instrument that provided an instantaneous calculation of the PMV/PPD (predicted mean vote/predictive percentage of dissatisfied) and WBGT (wet bulb globe temperature) index, and could directly display these values.

Research amongst users resulted in additional functions being incorporated into the Thermal Microclimate HD32.3 TC, and the company has now added the turbulence intensity as one of the new parameters. There were requirements to be able to identify the specific measuring places, a need for a memo recording function, and in the case of long-lasting measurements, that measurement data could be remotely accessible. These too have been added to the Thermal Microclimate HD 32.3 TC.

Jan Grobler, managing director of GHM Messtechnik South Africa, said: “This brand-new instrument from Delta OHM incorporates the latest in connectivity technology, the ability to make pictures to identify specific situations, and voice recordings. Building managers will benefit from the Thermal Microclimate HD32.3 TC device due to its advanced technology which enables all applicable factors that influence thermal comfort to be accurately assessed and analysed resulting in best practice for building and workforce health. This is particularly important in view of the need to identify potentially dangerous environments.”

New features

Newly included features of the Thermal Microclimate HD32.3 TC instrument include:

• A bright and clear touch display screen showing calculated values for WBGT, PMV/PPD and TU directly.
• Long lasting – offers a large memory for long lasting cycles.
• Data is immediately available for online cloud application and remote accessibility.
• Portability – operates for at least 24 hours on batteries.
• Voice recording and camera – possibility to include voice and visual comments.
• Wi-Fi connectivity, FTP storage and cloud connection.

Grobler concluded: “Indoor climate is important. As environmental regulations become stricter, monitoring and measurement of thermal comfort contributory factors becomes essential to the wellbeing of workers. The wide range of crucial measurements offered by Delta OHM’s Thermal Microclimate HD32.3TC and the instantaneous calculation and display of PMV/PPPD, WBGT and turbulence values, makes this instrument unique. It is also fully compliant to ISO 7243, ISO 7730 and ISO 7726.”

The Thermal Microclimate HD32.3TC weighs 500 grams and is 185 x 90 x 40 mm in size.

For more information contact
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Sherlock, an enterprise-ready smart construction contract management and administration solution developed by South African company, DoshEx, has been announced as one of the top three entrants in the 2020 IBM Beacon Award category, Blockchain Trailblazer. As far as its creators are aware, Sherlock is the first solution of its type globally.

The IBM Beacon Awards recognise IBM business partners around the world who create outstanding solutions and spark innovation using IBM products and technology. Sherlock brings together Internet of Things (IoT), distributed document management and Blockchain to improve the management of construction contracts.

DoshEx CEO Alex de Bruyn explains that Sherlock was developed with the construction sector in mind, but has potential applications in industries ranging from mining to pharmaceuticals and agriculture. Given Sherlock’s modular nature, its uses include smart contract administration for capital build projects, supply chain track and trace and condition monitoring, access management, proof of presence, safety and compliance management, milestone monitoring and payment certification.

Blockchain technology for the construction sector

“A blockchain governs the need for trust or for trusting a third party,” says De Bruyn. “My background is in banking. A few years back, I became convinced of the value blockchain technology could offer. I wanted to find an industry where the trust deficit was large enough for the technology to make an impact – a problem big enough for blockchain to solve.”

De Bruyn partnered with Richard Creighton, formerly MD of Honeywell Africa and now commercial director at DoshEx. Together, they saw the potential for using blockchain technology to overhaul contract management in the construction sector, which is rife with trust issues.

“I’ve been involved with numerous large capital builds and what always struck me was the amount of waste,” says Creighton. “Let’s say there were 10 parties involved. That meant 10 people keeping a set of the project’s profit and loss records, 10 sets of the master programme (which defines the project schedule), 10 registries for document control and so on. It was obvious to me that if we could put a system in place that would allow everyone to collaborate and access a shared ledger that represented an holistic picture of the job, we would all save time and money and be far more efficient. This is what Sherlock is designed to do.”

De Bruyn and Creighton started by examining all the trust issues endemic to the construction sector. These range from lack of trust between participants in the value chain (e.g. between developers, contractors and sub-contractors) to a lack of transparency of a project’s true health. Compliance – both with designs and codes or standards and with health and safety requirements – is an ongoing problem. Other challenges include scope creep and a lack of accountability that results in disputes or even mismanagement.

Sherlock provides a smart contract management network, using blockchain and distributed technology to increase transparency and reduce the reliance on trust in a network and IoT to create a trusted device to gather accurate data on real-world events. This network runs on the IBM Blockchain Platform, underpinned by Linux Foundation’s Hyperledger Fabric. It can be used with existing construction contracts for capital project builds in the industry such as JBCC, NEC and FIDIC as well as custom fit-for-purpose smart contracts.

“The smart contract makes certain data transparent to everyone involved across the project, while protecting confidential commercial agreements between specific parties,” says De Bruyn. “Data is captured in the field and is reported in near real-time on Sherlock.”

This ensures that everyone on a project has a single view of the truth. There are no longer issues of version control on drawings, questions around sign-off, or disputes regarding payment processes.

Robust in-field biometric devices are used to capture data such as milestones, compliance checks, or sign-offs, while IoT devices are used to monitor specific events to self-execute contractual agreements. For example, once a specific contractual milestone is captured, a related payment instruction process can automatically be triggered.

Creighton concludes that measurement activity is greatly optimised and the stakeholder cost take-out far exceeds the Sherlock system costs.

For more information contact Alex de Bruyn, DoshEx, +27 84 499 7774, alex@doshex.com, www.sherlock.global
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Hygienic food production

Food production is a matter of trust, and hygiene is the number one priority in the manufacturing process. Success is determined by both the reliability and the efficiency that make flawless production possible – whether during bottling, container filling or CIP cleaning. This makes it all the more important for plant operators to be able to rely fully on the measurement technology employed. Level and pressure sensors from VEGA have made a name for themselves over many decades for their reliability and longevity. Robust, versatile and easy to use, even under extreme conditions or strict regulations, they provide important inputs for delivering greater plant safety and efficiency.

Complete supplier for level and pressure
VEGA completes its measurement technology portfolio for food production with two new compact instrument series, comprising of pressure sensors and level switches. The product families Vegabar and Vegapoint prove that automation can be both simple and highly efficient at the same time, without compromising on dependability, hygiene or accuracy. The new measuring instruments are perfectly tailored to standard applications that still demand the highest quality. Their standardised hygienic adaptor system provides the flexibility needed to reduce and keep installation work and parts inventory at a minimum. The process fittings can be selected as needed and adapted to local requirements.

360° switching status display
Thanks to the all-round switch status display, all sensor states can be visually discerned from any direction. The colour of the illuminated ring, which can be customised from over 256 different colours, remains clearly visible, even in daylight. At a glance, the user can see if the measuring process is running, if the sensor is switched on or if there is a possible malfunction in the process.

Intelligence with IO-Link
Sensor intelligence is built right into the new devices: the standard IO-Link protocol ensures both a universal and particularly simple system of communication. This means that the instruments have a standardised communication platform that enables seamless data transfer and simple system integration. The new instruments can be easily read out and configured using a smartphone or tablet. Device setup and operation become considerably easier, especially in environments such as clean rooms, where physical access involves a lot of effort.

For more information contact
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RTS Africa Technologies (RTS) is a specialised Tshwane-based company focused on supplying engineered solutions to problems experienced by process engineers in industry.

There is now a serious problem in industry with harmful emissions from process plants – particularly in applications such as refineries and power generation. A significant component in controlling emissions is to ensure that combustion processes are efficient. In order to achieve this, it is necessary to ensure that air is fed into the process in the correct proportion to the combustible products present. Unfortunately, most of the problems encountered in controlling combustion processes are due to inadequate control of the air mixture entering the process. Control of these combustion processes is essential, not only to reduce polluting emissions, but also to optimise fuel efficiency, which can have a significant effect on reducing costs.

Oxygen content
While it is not the only gas component critical to this process, a primary indicator of incorrect combustion mixtures is the oxygen remaining in the flue gas. In theory, in a perfect combustion process, there would be no oxygen remaining in the flue gas. In practice, a significant reduction in noxious emissions can be achieved by controlling oxygen content in the flue gas to below at worst 4% and preferably to below 2%. In practice, we regularly measure oxygen content in flue gases at over 12%. (Note: there are other indicators of combustion efficiencies, such as carbon dioxide and carbon monoxide content in the flue gas.)

The reason for this is that in most combustion processes an operator will go out on the plant and take a spot measurement of (say) oxygen. He will then manually adjust the air registers until he gets a good (low) oxygen reading. He goes away and probably will not recheck anything for up to a week or more. In the meantime, the combustion process is not static but is affected by changes in the feed stock to the burner, and also by changes in the air feed that can be caused by alterations in atmospheric pressure, impact of strong winds, etc.

Elimination of these problems requires accurate and reliable instrumentation and control systems. Over the years RTS has assembled a portfolio of tried and tested technologies that offer cost-effective solutions to these problems.

Neo Monitors
RTS has represented Neo Monitors for nearly two decades. Neo Monitors is a Norwegian company that pioneered the application of laser technology to gas analysis. Note that the LaserGas Analyser can measure a wide range of gases that may be present in combustion off-gas. The analysers have no probes and are capable of measuring a selection of one, and in some cases two, gases (carbon dioxide and carbon monoxide for instance) in a soup of hydrocarbon and other gases. The instrument is tuned to detect a specific absorption line for the gas to be measured. It detects only the selected absorption line and is ‘blind’ to any other gases that may be present. There is therefore no possible cross interference from other gases. Installation of a single Neo Monitors LaserGas oxygen analyser on the stack with a PID control system to automatically control the air registers can provide constant regulation of the combustion process in real time.

All NEO Monitors instruments are built in Norway to a high quality standard and provide many years of accurate and reliable service.

For more information contact Catherine Scholtz, RTS Africa Technologies, +27 12 433 6335, catherine@rtsafrica.co.za, www.rtsafrica.co.za
A practical guide to the installation of loadcell weighing systems

Loadcells are a key component when it comes to ensuring that the manufacture of consumer goods, food and pharmaceuticals, amongst others, remains accurate and delivers consistent product quality and packaging.

In principle, loadcells are not complex devices, however they do require some special attention when being installed or maintained. Many of these requirements are common knowledge, yet get overlooked during installation and commissioning with direct impact on the accuracy and repeatability of readings from a loadcell system.

The aim of this article is not just to remind users about these, but in addition to question if changes made to the system over time have added any of these items as risk factors to the performance of the current system.

Are loadcells still the best choice for bulk vessel measurements?

Bulk vessel measuring systems have seen some dramatic changes in technology over the past two decades with the development of radar and ultrasonic level measurement devices with increasingly advanced algorithms.

Let’s examine the loadcell requirements in two sets, the first is physical (mechanical) and the second, electrical.

1. Support plates mounting to the loadcell need to be level or planar and the plates below and above the loadcell need to be co-planar.
2. Mounting kits used should be suitable for both the loadcell and the application and be able to compensate for any misalignment of support plates.
3. Support plates must be rigid and non-deformable.
4. Pay attention to the load direction indicated on the loadcell body and install accordingly. Remember that a loadcell can be installed 'upside down' as long as the load is applied in the indicated direct direction.
5. Remember that structures with four supports will not distribute the load uniformly and that 90% of the load can easily be distributed on just three of the legs. Keep this in mind when calculating the capacity of the loadcells.
6. Preferably do not exceed 80 % of the loadcell maximum rated capacity with respect to maximum load to be applied, or the designed load area.
7. The freer a structure is the more accurate its readings can be. Make sure that any piping that is connected naturally aligns to the vessel so as not to add strain to it where it is not possible to use free couplings or flexible hoses, which are recommended to ensure free movement.
8. Pipe support structures on pipe sections directly connected to the measured vessel need to be located at least 40 times the diameter of the pipe, away from the vessel.
9. An easy test for correct mechanical installation is to zero the system after installation, apply a load of at least 20% of rated weight, remove the load and confirm that the value returns to zero. Repeat a few times to confirm stability.
10. When using weighing systems with multiple loadcells, it is recommended to place constraints against both lateral and horizontal forces, which allows loadcells to operate correctly avoiding potentially damaging stresses. In bulk vessels, examples include anti-tilt constraints and leg supports. Anti-tilt constraints in outdoor applications where accidental impact from moving vehicles can occur should also be considered, depending on the application environment. Structures with legs need these to be connected to each other or otherwise properly secured to prevent flexing under load, which can cause lateral force on the loadcells.

With all these preparation requirements, it is tempting to give preference to radar or ultrasonic sensors that require only a single hole at the top of the vessel and a few test measurements to get them up and running. In a future article, we will look into the electrical requirements and discuss the niche that loadcells have carved for themselves in the bulk measurement environment.

To learn more about weighing system developments, be sure to join the world’s largest weighing community online at Weighing Systems 4.0 on Linkedin.

Editor’s note: There are a number of diagrams that further illustrate the ideas in points 1-10 above. Due to page constraints these could not be included in print, but interested readers will find them with the online article at www.instrumentation.co.za/10202r

For more information contact Nico Erasmus, Abacus Automation, +27 31 702 5767, nico@abacus-automation.co.za, www.abacus-automation.co.za
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Fluid Systems Africa (FSA) has been supplying industry with the highest quality fluid system components for a number of years and is now pleased to announce that it has expanded the product range. This adds value to customers by reducing costly procurement delays and allowing them to now purchase all products from one supplier.

FSA is now the authorised distributor for Universal Analysers, which produces gas sample extraction, transport and conditioning systems for CEM (continuous emissions monitoring) and process measurement. “We can now coordinate the interface between the sample probe, the heated sample line, the sample gas cooler and the balance of conditioning components, so that all required connections are provided in a single package from a single supplier,” explains FSA’s Stuart Harvey. “We can therefore simplify emissions and process gas sample measurements from the extraction point to the analyser. This complete system solution provides benefits such as professional industry expertise in products and applications for 25 years, as well as lowering procurement and order generation costs.

“If you let us know about your project in advance, we will work together to make sure the sample line and sample probe fit together seamlessly. We can all relate to the stress of having something not work the way we expect and this is taken to a whole new level when you must maintain uptime on a CEMS system. When something goes wrong it is never fun bouncing between multiple suppliers trying to diagnose the problem. We are happy to be your one stop shop to debug issues with your sample flow components, probe, sample line and sample conditioning.

“Our product range now includes gas sample coolers, gas sample probes, distillation sample probes, sample conditioning systems including sample conditioning drawers and portable sample systems, as well as oxygen cleaned and capped tubing, monel and electro-polished tubing and sulfinert coated fittings and tubing in coils or lengths.”

For more information contact Stuart Harvey, Fluid Systems Africa, +27 87 551 1677, stuart@fluidsystemsafrica.co.za, www.fluidsystemsafrica.co.za

Upgrade for PSM-700 pressure switch

WIKA’s PSM-700 pressure switch with large adjustable switch differential is now able to withstand higher process temperatures. Previously, the process media was limited to a temperature range of -30°C to 60°C. As a standard, the PSM-700 is now able to cater for process temperatures between -30°C and 115°C. Optionally, a switch with adjustable differential and fixed DPDT can be used with process temperatures between -30°C and 150°C.

The PSM-700 features a switch differential adjustable within a wide range of up to 60% of the setting range to realise flexible on/off controls. The product has reliable switching, thanks to switch point repeatability to within 0.5%. The measuring element is a fully welded bellows made of stainless steel 316L. This corrosion-resistant pressure switch is suitable for a broad range of media used in the process industry.

The case consists of a high-grade aluminium alloy with which the pressure switch can withstand the harsh operating conditions of the process industry.

For more information contact WIKA Instruments, +27 11 621 0000, sales.za@wika.com, www.wika.co.za
Emerson has introduced the Rosemount Thermowell Design Accelerator, a free online thermowell design tool that eliminates manual thermowell iterations facing process design engineers when sizing thermowells. It is easy to use and intuitively guides users through complex projects, saving hours of wasted labour and resources. Users will be able to iterate up to 1000 thermowell tags with a single click – all optimised for their process conditions.

On average, engineers can spend 50 hours doing thermowell calculations for a single project. Nearly 20 variables related to process conditions and thermowell dimensions are used to find a safe and efficient solution. Temperature points often need to be recalculated three to four times using traditional trial-and-error methods before passing global standards for safe operation outlined by the American Society of Mechanical Engineers (ASME).

Using the Thermowell Design Accelerator, engineers can reduce design ideation time to just 15 minutes.

The software uses ASME PTC-19.3 TW (2016) criteria and has built-in quality checks to confirm safe thermowell results that protect processes and the people that operate them. As the tool automatically iterates thermowell dimensional changes for safe use, it also tracks calculation history. Engineers get a breakdown for each thermowell iteration and the corresponding physical dimensional change to the thermowell as it calculates solutions. They can review each step for how the thermowell was able to pass PTC criteria and have a reference for updating their design if process conditions change. It’s true design, not just thermowell pass or fail.

Thermowell Design Accelerator is easy to use. The onscreen image dynamically updates as tag data is input and the help feature identifies potential calculation issues, like missing data or incorrect inputs. Plus, users get thermowell and matching sensor specification model codes for a quick and easy way to review, collaborate, purchase and share information with project teams.

The new tool is part of Emerson’s portfolio designed to help engineers quickly and confidently develop solutions. It can be accessed anytime online at www.emerson.com/thermowelldesignsoftware and designs can be saved in the MyEmerson personalised digital experience.

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

Contact us:
Telephone +27 11 621 0000
Email sales.za@wika.com

WHY RISK PREVENTION?
The more critical the process – for example, production of injection materials – the more important is the consistent maintenance of the sterile boundary in the manufacturing process. Selection of the right instrumentation prevents product loss. Diagnosis functions of the instruments could help to save high $ value batch by warning and indicating a potential risk. WIKA offers a bundle of instruments to secure your process. www.wika.co.za

Part of your business
Endress+Hauser partner programme is gaining importance through IIoT solutions

How can field instruments and components be easily integrated into automation systems? The answer is becoming increasingly important as industrial production digitalisation progresses. The Endress+Hauser Open Integration partner programme unites thirteen manufacturers that want to ensure the streamlined interaction of their products. Softing Industrial Automation joined the partner network at the beginning of the year.

The Open Integration partners test and document the interaction of their products for typical process automation applications. Users profit in two ways: by being able to combine the best products for each application, and through faster commissioning. Automation technology suppliers value the advantages of the Open Integration programme as well. For these companies, it’s important to be able to detect potential problems early and solve them prior to installing their products at the customer site.

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

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

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

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

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

Software for locating system

Siemens has introduced its new ‘Location Intelligence’ software, which expands the Simatic RTLS (real-time locating system) to include the digital twin. The web-based software analyses and visualises dynamic data, processes events and can be addressed directly from local ERP or MES systems. The intelligence acquired based on position data provides the user with a comprehensive overview of material flow, order information or possible problem areas.

The transponder ID is linked to the existing order data. Depending on the process step and order status, order information can then be displayed on the Simatic RTLS ePaper transponders, providing a paperless solution. Location Intelligence also offers users the opportunity to track individual workpieces or the entire order in real time. When the order ID is entered, the real-time positions of linked transponders are shown on the customer’s digital card.

The transparency achieved by this technology enables the individual optimisation of production and logistics processes. The key to these are virtually defined areas known as geofences. They can be created in the software using drag-and-drop and are used to detect entry into and exit from defined areas. The associated entry and exit events can be statistically evaluated, visualised or linked to additional actions.

In addition, the combination of location and business information leads to transparent processes: searches are reduced to a minimum because the positions of all relevant objects on various terminals are visualised in real time. Bottlenecks or deviations from the production schedule can be avoided easily using geofences. At the same time, previously untapped potential for optimisation in the factory can be identified through these real-time analyses and rapid decision-making is supported.

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Safety starts with tracking

Saryx Engineering’s HSEC Online has always based its business model on the safety of people; putting people first by using innovative technology to track document compliance. Now, as we move into the new normal of living and working with Covid-19, tracking employees, contractors and visitors becomes imperative.

Continuing with the company’s commitment to provide simple, smart and safe solutions, HSEC Online now offers a Covid-19 Wellness Tracker feature for business. Wellness Tracker allows companies to track employees, contractors and visitors, to manage and avoid the unnecessary spread of coronavirus, enabling employers to take action as health status changes, and immediately identify possible outbreaks in affected departments and regions.

Companies can now manage employee availability for on-site or remote work by tracking how many have been exposed to the virus, tested, or self-quarantined, and through this, assist healthy employees to re-enter the workforce safely. Data can be captured directly by employees and contractors, or indirectly, by security personnel, via a handheld device at access control points. The service is available via the Web or as a mobile app.

Real-time performance metrics
The HSEC Online Wellness Tracker dashboard allows companies to monitor and measure performance and metrics in real time, and on the go. Companies can visualise and analyse data from across the organisation, gaining valuable insight and driving quick and accurate decision-making. The platform is dedicated and ready to help users manage their operations during this time of extraordinary disruption. Tracking the wellness of your employees is only a mouse click away (www.hseconline.co.za).

For more information contact Saryx Engineering Group, 0860 995 105, saryx@saryx.co.za, www.saryx.com
Remote support of critical production systems in Covid-19

If, like me, you are now well versed in cooking, cleaning, muting the mic and disabling the camera every time you join the Teams, Zoom or Lync meeting, the South African Covid-19 lockdown has defiantly humbled you. I have had to adapt to working remotely very quickly; working from home, teaching kids and babysitting all in eight hours of the day is quite daunting, but it is what we all have to endure. System criticality is defined along various principles: people safety, product priority, financial impact, equipment health, and system downtime impact on process and cost. It is all the more important to focus on identifying critical manufacturing IT systems and how to support these remotely during these trying times.

The lockdown forced a finer look at the efficacy of supporting our production-critical systems: how good are our modern IT systems in allowing the workforce to work from home, access the business network and, more importantly, how good are our modern IT systems to enable us to use manufacturing IT systems and support it from the comfort and safety of our homes?

Here are some guidelines on how to ensure you are prepared for the next crisis that will require remote IT support:

- A team of competent, motivated staff with clear methods of communication.
- Documentation of system and network architectures available to manufacturing IT users and support teams.
- Remote access to business as well as DMZ/demilitarised networks.
- Enable multiple methods of access to a system. Usually I look at a tiered approach to this:

1. Physikal access – can I access the server/client/device by interacting with it via my laptop/HMI and have all the relevant security details such as passwords, ACLs, etc.?
2. Remote access inside – can I access the server/client/device remotely from within the network?
3. Remote access outside – can I access the server/client/device remotely from outside the business network?
   - Security protocols revisited and geared for mass remote access to business network and to DMZs. Now is the time to revisit access control lists and maybe set stringent password rules in place.
   - Grant certain technical support teams dedicated, secure and controlled remote access to manufacturing systems. I would have the business users enter the network via a completely different method (VPN) compared to the support teams; this would allow for faster access to manufacturing systems and no concerns about latency or congestion from accessing the network during peak times. Consider this when large numbers of workers need to access the network remotely.
   - Permits issued to support teams who need to be on site in the event a system requires support, but is not connected to any network, or in the event where a remote connection could not be established. The amount of administration that goes into having anyone travel legally during Stage 5 lockdown really increased my appreciation for access control, security measures, and the communication around them.

Here are some tips to enable manufacturing IT support teams to ensure manufacturing processes run smoothly by enabling critical support staff to work from home:

- Appropriate device from which support is executed.
- Reliable, sturdy network.
- Administrative control of the device; all relevant accounts to match the level of service to be rendered.
- More than one method of accessing the network.
- Regular password regeneration after a set amount of sessions on the network.
- Regular check-ins to team leadership, updating with regard to planned actions and/or incidents handled.

While it is convenient to allow for secure, access controlled entry into the business network, remote entry into a DMZ is often frowned upon by many, in fact network architects and engineers develop strict protocols and guidelines that ensure industrial networks and DMZs are not accessed remotely at all, for security reasons. I do however think now is the time to evolve and mature the protocols and security practices and tools around having DMZs and manufacturing IT systems connect directly to the Internet, to reap the benefits of a connected and converged manufacturing IT discipline.

We are nearly two months into the Covid-19 lockdown with many employees working from home. Unfortunately, manufacturing processes need to run continuously in order to achieve beneficial operations. By following the above guidelines, the manufacturing IT systems can continue to enable the manufacturing processes, even though IT and support teams are not on the plant floor or at the data centre.

Lance Turner

Lance Turner is an MES specialist employed at Sasol’s Secunda plant. He has an honours degree in Information Systems with a focus on Enterprise Architecture design and solutions. A certified MESA MES/MOM student, his passion is amalgamating general IT across the manufacturing spectrum. Lance’s vision is for a converged IT and manufacturing discipline that will become the reality of Industry 4.0. His team motto is MES services that are always available, always stable, and always dependable.

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A new approach to wireless networks

The Instrument Area Network (IAN) has been developed by Schneider Electric as a cost-efficient and flexible industrial wireless network as an alternative to more costly systems. Bluetooth communication between the field sensors and data collectors saves battery life and makes the network flexible and easy to install, giving users a cost-effective solution.

How it works

The IAN system consists of wireless field sensors for measuring absolute and relative pressure, differential pressure and temperature. These measurements can be linked via Bluetooth to the central collectors. These collectors collect the measurement data from a maximum of 8 wireless field sensors and send them via WirelessHART to any system.

By choosing Bluetooth between the field sensors and collectors, the batteries of the field sensors last longer than with a complete WirelessHART system. Local configuration is also easier to do with an app for a phone or tablet, using Wi-Fi. This makes Schneider Electric’s Instrument Area Network a cost-effective, user-friendly and flexible wireless system.

Differential pressure measurement: the WDP10 differential pressure sensors measure the differential pressure of various industrial processes and then transmits the PV wirelessly via Bluetooth to a central collector (WCC10). This sends the values from multiple sensors via WirelessHART to any central system. There are versions with differential pressure ranges up to 500 mbar, 2,1 bar or 21 bar. The field sensors are explosion-proof and have ATEX certification.

Gauge pressure measurement: the WAP10 absolute or gauge pressure sensors measure the pressure of various industrial processes and transmit them wirelessly to a central collector (WCC10). This sends the values from multiple sensors via WirelessHART to any central system. There are versions with pressure ranges up to 2,1 bar. The field sensors are explosion-proof with ATEX certification.

Temperature measurement: there are RTD and thermocouple versions from -200°C to 885°C, with various insertion lengths between 50 and 400 mm. Optionally, thermowells in various lengths can be supplied. The field sensors are explosion-proof according to ATEX.

For more information contact Johan van Jaarsveldt, EOH Process Automation Solutions, +27 87 803 9783, johan.vanjaarsveldt@eoh-pas.co.za, www.eoh-pas.co.za

Wireless machine monitoring

SKF has teamed up with connectivity expert LumenRadio to create a new wireless monitoring system, measuring vibration and temperature. The SKF Enlight Collect IMx-1 System combines SKF’s knowledge in machine health monitoring with LumenRadio’s patented network technology.

When fitted to rotating equipment, the system economically automates vibration data collection. Predictive maintenance programs can be expanded with data captured more often, which increases defect detection rates and leads to avoidance of costly unplanned machine shutdowns.

With LumenRadio, SKF can employ its MiraOS operating system, which provides several benefits with wireless communication. A mesh network protocol enables sensors to exchange data, navigating around obstacles, such as pipework and liquid storage tanks, instead of trying to punch through them. LumenRadio’s patented cognitive coexistence technique scans the radio spectrum and switches frequencies to avoid busy channels and overcome interference. All this means increased radio reliability and less retransmission, significantly reducing the power consumption of the battery in a small device.

Chris G. James, product manager at SKF says: “Low power consumption was one of the main reasons SKF chose to work with LumenRadio. The technology not only provides high precision time stamping of data, it also minimises energy usage by knowing exactly when to switch the radio on and off. This means the sensor can work on a single battery for many years, in tough wireless environments such as paper mills.”

The self-forming sensor network requires no existing infrastructure like Wi-Fi and can be deployed on a scale wide enough to cover the monitoring points of today’s walk-arounds inspections. Precise timestamping of vibration data enables wider analysis capabilities in SKF’s strategy of reliable rotation as a service.

For more information contact Samantha Joubert, SKF South Africa, +27 11 821 3500, samantha.joubert@skf.com, www.skf.com
In my 30 years devoted to optimising controls in industrial process plants in many countries, I thought that I had seen all the possible process dynamics that one would encounter. Imagine my surprise when I came across one I have never encountered before. This was in a temperature control on a copper smelter plant, where I recently presented a course on practical control to process control engineers and also performed some optimisation in a couple of their plants.

Temperature control optimisation is usually extremely onerous, mainly due to the slowness of the process, and requires a great deal of patience whilst waiting, sometimes hours, for a process to respond to a step in the controller output (PD) or a change in setpoint (SP). This loop was no different and what made it even more confounding was the fact that the PLC control block had not been set up correctly inasmuch that the PD tracking had not been set, so that when the controller was placed in automatic from manual, the controller’s PD should carry on at the same value it had when in manual. Instead it dropped to zero and severely bumped the process. This is incredibly frustrating because it is absolutely necessary to make bump-free changes from automatic to manual and back again when performing optimisation.

Unfortunately, no one capable of sorting out the PLC program was present over the weekend on which the work was done, so we had to improvise.

The loop in question was top of the operators’ problem list. It was in a terrible continuous slow cycle with the PD being either fully open or completely shut and the PV slowly going above or below the setpoint. The operators had unsuccessfully tried to control the loop in manual, but the problem was that large load changes took place every 20 or 30 minutes when a converter was turned out of stack and emptied. Therefore they had had to leave the loop in automatic, but it was really badly upsetting production. Incidentally, it had been like this ever since the plant was built and commissioned eight years previously.

Strange response in the PV

The process was the temperature control of a cooling heat exchanger. Now heat exchangers normally always have self-regulating dynamics. On starting our tests, which mainly had to be performed in manual, we saw that after an hour the PV showed no sign of settling out as normal with a self-regulating process, but continued ramping either up or down depending on the magnitude of the PD. I then managed to get hold of a senior process engineer who explained that the process fluid was actually recycled back to the converter’s hood after passing through the exchanger. Therefore after the pass through the hoods, colder water was coming back to the exchanger, cooling it even further. Therefore the process is integrating.

The next thing that I noticed is that every time a step change was made on the PD, the PV responded in a strange way. It firstly slowly curved into the ramp. This normally means that a large lag is present in the process, which is quite normal in temperature processes. However after a while the slope of the ramp curved back into a different slope, which is a very strange response that I had not seen before. This can be seen in Figure 1.

Second order lag

After thinking about it I realised that it was a second lag coming back into the PV as the recycled cooling water started coming back into the exchanger. Therefore the dynamics of the process are a slow integrator with a second

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**Case History 172**

Interesting controls in a copper extraction plant.

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, +27 82 440 7790, michael.brown@mweb.co.za, www.controlloop.co.za

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![Figure 1.](image-url)
order lag. This is really unusual dynamics. I have encountered second order lags occasionally on self-regulating processes, which is usually a sign of loop interaction, but never on integrating processes.

Fortunately for me, the Protuner tunes from a frequency response that it gets by performing a digital Laplace transform over a step change in manual. I strongly believe that no model based tuning system would be able to tune this process, as it would be almost impossible to make a sufficiently accurate model.

The difficulty here was that we couldn’t get the process into balance due to the PLC problem. Therefore we put the controller into automatic and changed the tuning to P only with a proportional gain of 8. I should mention that the original unstable tuning had P, I and D. Also the derivative filter had been set completely incorrectly – typical trial and error ‘desperation’ tuning.

A P only controller is the equivalent of a ball valve on a level control, and automatically finds the balance point. In this case, as established later, the integral retention time was 1 hour and 10 minutes which is very slow, so it took a long time to try and get the process to near balance, particularly with a few small load changes that were occurring. We got it reasonably close, but unfortunately the operators had to make changes in the process that would have caused a dramatic bump, so we did a step quickly even though we were not exactly at balance. This step can be seen in Figure 2.

Conclusion
We then performed a graphic edit on this PV response to try and get the response to what it may have been if we had actually reached balance. Tuning on this step and then selecting a fairly conservative P+I tune, we first tried it out on the Protuner’s simulator with the process modelled from the frequency plots. It seemed to work well. Also trying the same model with the original tuning exhibited the same instability as originally seen in the loop. Therefore with a great deal of confidence we put this tune into the actual controller and put it into automatic which of course caused the usual huge bump, as the PD went to zero. It then took only about 20 minutes for the loop to get close to setpoint and settle out. It was slightly below setpoint due to the conservative tune, which had an extremely long integral. However within about 30 minutes it reached setpoint and stayed there.

We ran the control overnight and saw the next day that it had performed extremely well with the load changes. The process manager was really happy to say the least, and said he couldn’t have believed it was possible to have tuned the loop so well.

Figure 3 is a screenshot taken from the actual control system’s trends package which shows the performance before and after the optimisation exercise. (The green line is the PD (controller’s output) – all in all, another very successful and pleasurable day at the ‘coal face’.)
CONTROL SYSTEMS

PC-based control for Covid-19 rapid testing production lines

The rapid testing equipment production lines made by Ginolis in Qulunsalo, Finland, have proven themselves in the market for almost a decade. Because of the coronavirus pandemic, previously delivered lines are now being converted to the Covid-19 rapid testing configuration. The compact automation technology from Beckhoff contributes significantly to the production equipment’s modularity and high quality.

Since its foundation in 2010, Ginolis has offered high-quality automation solutions for the production and assembly of medical devices such as point-of-care diagnostic equipment, micro-fluid devices, insulin pumps, medication dispensation devices, and test cartridges. Rapid diagnostics have turned out to be an especially quickly growing field in health technology, as Ginolis CEO Teijo Fabritius explains: “At its core, our business involves automating the manufacture and inspection of rapid diagnostic products. Such medical consumables are currently in high demand around the world. Our high-quality automation solutions don’t just lower the production costs of these consumables. The faster and more accurate tests also simplify their handling and increase their reliability.”

Modular production lines are adaptable

All of Ginolis’s production lines are modular in order to be able to offer custom-tailored capacities with plenty of opportunities for subsequent scaling. As Fabritius explains: “Thanks to our modular approach, the customer does not need to worry about future volume requirements when he makes his investment, because to increase his capacities he only needs to add more modules. The various standard modules for things like assembly and inspection provide a huge competitive advantage since they are usually available and can ship very quickly. We have lead times of only a few months, which is very unusual in our industry.”

The individual production modules are controlled via a CX2040 embedded PC from Beckhoff that is equipped with an Intel Core i7 quad-core CPU running at 2,1 GHz. The control software is TwinCAT 3 NC I. Most production lines have several hundred motion axes and hundreds of I/Os. The individual modules generally have 50 to 100 EtherCAT I/O connection points and multiple Beckhoff drive axes that are controlled via EL72xx servomotor terminals, EL70xx stepper motor terminals, and EL7411 BLDC motor terminals. The intelligent XTS transport system is used in Ginolis’s high-capacity assembly lines.

PC-based control is integrated, compact and powerful

According to Fabritius, Genolis believes in Beckhoff’s PC-based technology for several reasons: “PC-based control allows us to seamlessly integrate multiple software-based functions into the automation system. In addition, the embedded industrial PC systems are very compact and powerful. Particularly where automation components are concerned, compactness is critically important since space is usually at a premium, especially in cleanrooms. And the more functions we can integrate through software, the more compact, flexible and easily upgradeable we can make our solutions. PC-based control technology provides an outstanding platform for meeting all these requirements. In addition, Beckhoff has developed many additional products that fit well into our automation concept, such as the software-based TwinCAT Vision real-time image processing system and the compact EJ-series EtherCAT plug-in modules that speed up the installation process considerably.”

A capable automation system is also essential to ensuring the quality and reliability of the production process, says Fabritius: “A good example is the so-called marker for myocardial damage. It must be determined from a blood sample, which makes it easy to understand why getting correct results is so important.”

Fabritius concludes that the rapid advances in the health sector make it essential to have a long-term partnership with the automation specialist: “Ginolis picked Beckhoff as its supplier because both companies operate worldwide and can provide the necessary support and spare parts in close customer proximity. Beckhoff is a well-known company whose products have worked well for us in previous projects. Having a long-term relationship is critically important in the health sector since all products require regulatory approval. As soon as such an approval has been granted, making any changes becomes exceedingly difficult. Accordingly, the automation components must be available for the long term, something that Beckhoff is really good at.”

For more information contact Dane Potter, Beckhoff Automation, +27 79 493 2288, danep@beckhoff.com, www.beckhoff.co.za

Image copyright Ginolis, Finland.
Dry-well calibrator

WIKA’s innovative CTD4000 series calibrators have been designed for on-site applications as well as for the severe conditions of the naval and marine sectors. Their ease of use and compact and practical design make them unbeatable in industrial processes where the calibration of temperature measurement systems is essential for the control of processes and the quality of the final product.

Special attention is paid to reduce weight, size and to reinforce robustness by using an aluminium body as well as aluminium and stainless steel for many internal parts. With the available standard inserts, the calibrators are versatile and can be easily adapted for the calibration of temperature probes with the most common diameters. Customer-specific inserts and bores are available on request.

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

Optimised encoder portfolio

With an optimised encoder portfolio, Turck serves a wide range of customer requirements from price sensitive encoders, right through to particularly robust and wear-free devices. From three product lines, users have the choice between conventional encoders of the Efficiency or Industrial line as well as Premium encoders with contactless detection.

The Efficiency line comprises incremental and absolute multi-turn encoders. These are suitable for a large number of standard applications, with IP64 protection, a radial shaft load of 40 Nm and a temperature range down to -20°C. A large stock level for variants that are particularly in demand ensures shorter replenishment lead times.

Industrial line encoders serve special applications with greater environmental requirements and a higher shaft load. These also offer protection up to IP69K and double-bearing technology.

Turck’s proven QR24 and QR20 encoders with contactless detection complete the product portfolio. The Premium line encoders have a permanently sealed housing and operate entirely without contact. In this way, they can also be used in adverse outdoor conditions.

For more information contact Brandon Topham, Turck Banner, +27 11 453 2468, brandon.topham@turckbanner.co.za, www.turckbanner.co.za
Pepperl+Fuchs has developed the new LB Profinet gateway so LB remote I/O systems can be easily connected to the Profinet world. End-to-end communication guarantees that the intelligence already available in the field can be put to optimal use. This will ensure that even currently existing plants are prepared to meet future requirements and Industrial Internet of Things.

Process plants all around the world need to undergo comprehensive modernisation at regular intervals. This generally involves replacing obsolete control systems and bringing things up to speed with modern technological demands. It is crucial to make the respective plant future-proof in the long term by using new technologies. Generally, it is important that devices used at the field level do not have to be replaced at high cost, but can instead be maintained for continued use. This is exactly the kind of situation where remote I/O technology can be used. The technology makes it possible to seamlessly connect both conventional 4…20 mA devices and discrete sensors to a modern bus protocol. Pepperl+Fuchs has developed the new remote I/O LB Profinet gateway for owners who want to convert their process plants to Profinet control technology as a part of such modernisation measures. This gateway makes it possible to continue using traditional measurement technology at the field level and connect it to the very latest control system technology. This can mean considerable cost savings, especially in the case of large process plants.

**Take full advantage of all the benefits of HART**

More than 80% of all field devices already support the HART protocol. The new gateway therefore offers not only conventional Profinet functionality, but also full access to all connected HART devices. Users also have access to HART auxiliary variables as a second measuring value in addition to process variables. The Profinet gateway not only allows users to read the sensor measurements themselves, but also to access auxiliary variables cyclically every 500 milliseconds – 160 messages per second for fully occupied remote I/O systems – meaning that a single measuring point can supply much more information than was previously the case.

It goes without saying that this method of data exchange is highly efficient for plant operators, since additional sensors are unnecessary in locations where secondary measured values need to be recorded. For example, a pressure transducer can supply the current process value – depending on the measurement type set. HART variables can be used to transmit additional parameters such as sensor temperature, electronics temperature and pressure. The accuracy of the analog measured value and the functionality of the devices can also be checked. It used to be the case that cyclic calibration of sensors could only be carried out in a workshop after a time-consuming removal operation. In future, the new gateway will allow this task to be completed quickly and conveniently online via HART.

But the HART IP protocol allows access to more than just the device parameterisation – the complete diagnostics of the individual field device can also be read out if necessary. The brief diagnostic information contained in each HART command sent plays a vital role in this connection. Based on these values, an asset management system decides whether the complete diagnostics should be read out to obtain detailed sensor diagnostics. During servicing, the data can be used to identify and fix possible errors more quickly. Since both the Profinet and the HART IP protocols run via the same wire the new gateway is characterised by a high level of flexibility. It is also a high-performance solution, since up to 80 field devices can be connected to a fully occupied remote I/O system and communicate without a time delay.

The new LB Profinet gateway is a great choice not just when modernising existing plants, but also when expanding them. As the narrowest system on the market with an ultra-compact housing design, it really plays to its strengths in cramped conditions. A switch from conventional wiring to remote I/O also reduces installation costs in terms of underwiring and marshalling cabinets. This saves space and a lot of money. The gateway can also be used when building new plants. For example, it makes sense to use it anywhere that the Profinet protocol is used for communication and the necessary measurement technology is available, but not always as a Profinet device. The relevant data can now easily be gathered via remote I/O using the gateway.
Perfectly suited to IIoT applications
To make process plants future-proof, it is important to tailor them to the requirements of IIoT. Owing to Ethernet-based communication, the new Profinet gateways facilitate the seamless integration of all device and process data. HART IP enables the gateways to import diagnostic data available in the field into a different system via a second communication channel (parallel to the traditional automation pyramid). The data can then be made available via a cloud network or similar, or copied to the user’s analysis tool of choice for predictive maintenance and process optimisation purposes. This provides seamless support for the NOA architecture (NAMUR Open Architecture) designed by NAMUR.

The developers of the new gateway prioritised ease of use. For example, device health can be read out simply by looking at the RGB LEDs. The colours were selected in accordance with NAMUR NE 107. Green stands for ‘active diagnostics’, red for ‘failure’, blue for ‘maintenance required’, yellow for ‘out of specification’ and orange for ‘function check’. The gateway is also the only device on the market to feature an extra-large display that enables easier on-site commissioning and the display of diagnostic data down to the sensor level. To ensure uniform representation of the various messages, assignment to the diagnostic display was carried out on the basis of the NAMUR NE 107 symbols. This allows users to see at a glance whether communication with the control system is running smoothly, whether the internal bus is operating correctly and the HART device is being detected and whether an error is present in the module. All diagnostic and status information is displayed very clearly and in some cases even in plain text. This ensures not only quick and easy operation of the gateway, but also highly transparent processes.

An intelligent redundancy concept for a high level of reliability
The developers of the gateway implemented an intelligent redundancy concept that prevents failures and offers maximum network stability for critical applications. The device therefore features two Ethernet interfaces and an integrated switch that safeguards network functionality on the basis of the Medium Redundancy Protocol (MRP). If a cable fails, the data packets that are transmitted via this cable may no longer be received. To restrict the failure to the damaged device or the faulty part of the cable, the ring network is reconfigured so that the data packets can be sent via an alternative route. The integrated switch saves a lot of money in this respect since no additional hardware is required.

Since all the existing LB I/O modules from Pepperl+Fuchs are compatible with the Profinet gateway, they can continue to be used with the new device. In plants that are already using the LB system, for example, there is no need to carry out new explosive atmosphere assessments, since the sample calculations typically produced for configurations will still be valid. This cuts the time and expense associated with installation significantly. Commissioning the LB Profinet gateway is very simple with GSDML from the PROFINET master and no DTM is required. It is also possible to configure parameters when setting up the system and modules via GSDML and, for example, to switch line fault detection on or off. If field devices are installed in inaccessible parts of the plant, however, parameterisation cannot be performed on-site with a HART modem. A DTM is available for such cases as a way of establishing a transmission path from the system level. Operators can complete parameterisation from the comfort of the maintenance station. All of the basic settings, such as IP address, can be easily configured directly at the gateway.

Top-notch security for worldwide use
The world is becoming more and more networked, so the risk of unauthorised access is growing constantly. With this in mind, the new Profinet gateway provides optimum protection for automation components and systems by meeting all the necessary safety requirements, such as standard IEC 62443. The device also holds all the necessary international approvals, making it ideal for use anywhere in the world. The gateway is available with ATEX, IECEx, UL, INMETRO and EAC certificates and is also approved for installation in Zone 2, Class I/Div. 2.

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Ratchet P-Clamp from HellermannTyton

When a heavy-duty equipment manufacturer asked HellermannTyton to devise the most effective way to attach and remove cables for additional equipment, nobody imagined that a well-trodden path would lead to the birth of a new type of fixing part.

But early on, the product designers became so frustrated with the practical limitations of conventional p-clips that they decided to apply their collective cable tie engineering know-how to come up with a better solution.

Their goal: an end to fiddly two-handed fastening and fixing in a single step and no damage from clips that twist when the screw is torqued down.

Metal and plastic p-clamps have evolved

The result is Ratchet P-Clamp. As the name suggests, the designers have added a ratcheting closure mechanism. This makes it possible to separate the process of fixing and orientating the clamp from the fastening of the cable or hose. What is more, it can be easily reopened and reused.

Made from toughened polyamide with a steel mounting plate, the Ratchet P-Clamp is user-friendly. The rugged clamp is ideal for fastening and fixing cables, wires, pipes and hoses in heavy-duty applications including solar farms and mining.

How it works

Quite simply, you place the bundle in and close the clamp by hand to the required diameter. The Ratchet P-Clamp comes in four flexible sizes covering the common 6.2 mm to 51 mm diameter range. Advantages at a glance:

- Preinstall the clamp before you close it.
- Easily lever it open with a flathead screwdriver for maintenance.
- Drastically reduce the number of specific clips in the inventory.
- Ribbing on the inside of the clamp centres cables and helps prevent the pinching common with p-clips. Soft inserts are also available to protect sensitive insulation or hoses from abrasion. An additional cable tie fixing point on the leading edge opens up possibilities for routing other items along the clamps. A variety of mounting plate angles makes it possible to piggyback clamps on a single mounting point.

For more information contact HellermannTyton,
+27 11 879 6600, jhb.sales@hellermann.co.za, www.hellermannytton.co.za

Programmable LED strip light

The new WLS27 Pro comes in distinct IO-Link and discrete controlled Pro Editor compatible models. Banner’s Pro Editor software allows users to program device status, colours and animations for control via three discrete inputs. The application-based interface makes it easy to configure a light for a wide range of applications such as displaying machine warm-up time, indicating unique steps in an assembly process, showing distance and position information and communicating multiple machine states. Pro Editor models are discreetly controlled and ideal for users who do not have IO-Link, but who want control and customisation to communicate information visually.

The IO-Link models allow for dynamic control – reacting to inputs from other devices – and have additional modes that the discrete units do not. IO-Link enables users to change device parameters from the control system as needed, such as during product changeover, which reduces downtime and allows machines to accommodate greater product diversity.

These models can be divided in up to 10 segments for applications like assembly guidance or pick-to-light. They also offer unique LED control to provide advanced users with total control. The WLS27 Pro with IO-Link connects cleanly to IO-Link architecture and helps reduce costs, increase process efficiency and improves machine availability.

This work light can be programmed to have bright white light for safety or efficiency during normal operation and then to indicate other machine statuses, such as red for a stop condition. Additionally, advanced statuses allow the WLS27 Pro to indicate alarm states, show temperature and display position information. The rugged IP69K design provides reliable indication in a wide variety of conditions, including harsh washdown, machining and outdoor environments.

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Dry wells for field applications

Fluke’s 914X series field metrology wells extend high performance to the industrial process environment by maximising portability, speed, and functionality with little compromise to metrology performance.

Field metrology wells are packed with functionality and are remarkably easy to use. They are lightweight, small and quick to reach temperature set-points, yet they are stable, uniform, and accurate. These industrial temperature loop calibrators are perfect for performing transmitter loop calibrations, comparison calibrations, or simple checks of thermocouple sensors. With the ‘process’ option, there is no need to carry additional tools into the field. This optional built-in two-channel readout shows resistance, voltage, and 4–20 mA current with 24 V loop power. It also has on-board automation and documentation. Combined, the three models (Fluke 9142, Fluke 9143, and Fluke 9144 – each with a process option) cover the range of -25°C to 660°C.

High performance for the industrial environment

Field metrology wells are designed for the industrial process environment. They weigh less than 8.2 kg and have a small footprint, which makes them easy to transport. Optimised for speed, the wells cool to -25°C in 15 minutes and heat to 660°C in the same time.

Field environment conditions are typically unstable, having wide temperature variations. Therefore each unit has a built-in temperature compensation that adjusts control characteristics to ensure stable performance in unstable environments. In fact, all specifications are guaranteed over the environmental range of 13°C to 33°C.

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